THIRD EDITION

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ALCOHOL

NO ORDINARY COMMODITY

Research and public policy

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Alcohol: No Ordinary Commodity

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Dedication

This book is dedicated to Griffith Edwards and Esa Österberg, two career scientists who contributed enormously not only to the writing of this book, but also to the field of alcohol studies. Griffith Edwards died in London on 23 September 2012 at the age of 83. To those who knew him from his reputation, he was the originator of the alcohol dependence syndrome concept, the inspirational leader of the UK National Addiction Centre, the author of numerous books, a perennial advisor to the WHO, and the long-time Editor of *Addiction*, the internationally respected scientific journal.

To those who knew him personally, he was more than his reputation. Always an iconoclastic voice on the lecture circuit, Griffith was one of the most influential figures in the modern history of addiction science. He challenged the status quo, pushed the envelope of critical thinking, demonstrated unwavering compassion for addicted patients, questioned conventional wisdom, promoted research integrity, denounced conflicts of interest, and most of all, created institutions that changed things for the better. One of those institutions is the tradition of policy-related research monographs, of which this book is the latest iteration.

Following his collaboration with Kettil Bruun and other scientists on the influential monograph *Alcohol Control Policies in Public Health Perspective* (Bruun *et al.* 1975), Griffith was convinced that multi-authored, cross-national, integrative reviews of the world literature on alcohol policy were a necessary step in bringing the latest scientific information to policymakers and public officials. He concluded that to achieve this goal, the books needed to be written with a single voice, reflecting not only the consensus of opinion of a group of carefully chosen scientists, but also the concerns of the policymaker and the 'man on the Clapham omnibus', referring here to the people who are most affected by alcohol and drug problems in their families and their communities. Griffith was unquestionably the guiding force behind *Alcohol Policy and the Public Good* (Edwards *et al.* 1994) and the first two editions of *Alcohol: No Ordinary Commodity* (Babor *et al.* 2003, 2010). Each of these books approached the emerging literature in different ways, but all shared his aim of bridging the gap between science and policy.

What counted most to him was the ability to share ideas, launch projects, and move mountains, preferably by means of evidence-based policy. His home on Greenwich Park was often used as the base of operations for book project meetings, with his Scottish terrier providing comic relief to the assembled academics as she coaxed them to throw her another tennis ball. He understood that creativity and consensus among a team of rivals are often fostered by a hospitable social setting and by the distraction of a little dog retrieving balls in an English drawing room.

Griffith Edwards' loss to the field of addiction studies was augmented by another passing that was even closer to the present volume. Esa Österberg, a co-author of this volume until his death on 26 September 2021, was hired as a young economist at the

Finnish Social Research Institute of Alcohol Studies by Kettil Bruun in the early 1970s, broadening the scope of a research group which primarily had a sociological focus. One of Esa's first contributions to the field was thus the economic perspective and analyses he provided as a co-author of the 'purple book' *Alcohol Control Policies in Public Health Perspective*—the book which started the tradition continued in the present volume, of collaborative cross-disciplinary international scholarly projects analysing and pulling together the research needed to address alcohol policy priorities.

Esa's contribution to the tradition continued throughout his career, as a co-author on the four volumes in the direct succession of the 'purple book'—*Alcohol Policy and the Public Good* and the three editions of *Alcohol: No Ordinary Commodity*—and also as a contributor to other international collaborative projects such as Alcohol, Society and the State in the 1970s and the European Comparative Alcohol Studies project in the 2000s. In these and his many other publications, his expertise was not only in economics—he contributed as a social and historical policy researcher as well.

From the cross-national collaborative experience of the purple book and *Alcohol, Society and the State* emerged the primary international social alcohol research society 'the KBS'—the Kettil Bruun Society for Social and Epidemiological Research on Alcohol. Esa made major contributions to its tradition and functioning, serving as both Treasurer and Secretary for a number of years. One president of the Society remarked that when he left these positions, she had to find two people to fill his shoes.

Many of his collaborators and others in the field have warm memories of time spent here and there with Esa, and appreciation of his contributions to our collaborative efforts, and indeed to world-changing scientific knowledge.

For these and many other reasons, this volume is dedicated to Griffith Edwards and Esa Österberg.

<div align="right">The Authors</div>

Alcohol: no ordinary commodity—many more lives to save

With regard to alcohol and alcohol policy, the world we have today is quite different from the one in 2003, when *Alcohol No Ordinary Commodity* (ANOC) was first published. The world has witnessed many alterations in global and local markets for alcoholic beverages—consolidation and acquisitions from transnational producers, expansion and self-protection by local operators, and huge brand expansions. Who would have anticipated that in the current joined-up world of smart phones and 'influencers' on social media, drinkers and drinkers-to-be would themselves become the best alcohol marketers and the most influential brand ambassadors to the people surrounding them, physically and virtually.

Research and knowledge have flourished and are available at our fingertips. Labelled as a major obstacle for sustainable development and human capital, we have seen growing evidence of alcohol-related harm, including alcohol's harm to others and to society in general, as well as a deconstruction of the myths about health benefits from alcohol.

On the policy front, targets for alcohol were adopted by global leaders for the first time in both health and socio-economic development agendas in the form of the United Nations Sustainable Development Goals (SDGs). The World Health Assembly endorsed the Global Strategy to Reduce the Harmful Use of Alcohol in 2011, declaring alcohol as a major risk factor for non-communicable diseases (NCDs), despite incredibly strong resistance from vested interests. It is perhaps the first time that the list of cost-effective alcohol policy interventions was approved by global health policymakers, in the form of the NCD 'Best Buys' and the World Health Organization's SAFER Initiative, which promotes alcohol pricing policies, availability controls, and marketing restrictions. This is a dream come true after the earlier editions of ANOC began to identify the most effective interventions from the plethora of policy options that have been tried.

However, some things may not (yet) change in this tricky liquid's terrain. To name a few, alcohol is still the only major psychoactive and dependence-producing substance without a legally-binding international health regulation. In my own experience, four discussions about such a global binding tool were aborted in global health summits as soon as they were proposed. Despite their vast and diversified impact, alcohol-related problems are (still) the privileged responsibility of the health sector, and not others, in most societies. The alcohol industry increasingly takes a leading role in alcohol policymaking worldwide, including public-private partnerships and corporate social responsibility initiatives. This phenomenon relegates commercial determinants of health and vested interest management of health policy to the status of abstract concepts in textbooks.

In my opinion, what the third edition of ANOC has done best is to present the scientific basis for alcohol policy in a way that promotes an evidence-based policy response. In a world full of industry-funded misinformation, ANOC provides scientific knowledge, based on logical policy arguments in a reader-friendly way. ANOC also includes substantive analyses of the public policy domain and process, as well as the policy actors, which are as important as the technical content.

My team and I had a good experience in translating the second edition of ANOC into the Thai language. We were proud to see policymakers use our Thai ANOC as the manual for modern alcohol control.

If ANOC were a person, it would be a scholar who is both streetwise and test-wise, with an understanding of the policy landscape and a passion to make the world a better place.

Consider this—with an average reading speed of 200–250 words per minute, 12 people in the world would not live long enough to get to this point in the foreword because of alcohol. During a single reading from the first to the last page of this book, the global alcohol death toll would amount to many hundred thousand.

Though these are well-documented health statistics, the people they refer to are not just ordinary lives lost. These alcohol-related tragedies are preventable.

With this, the third edition of ANOC, we can do more. We can save many more lives, we can save millions, with evidence-informed actions taken together.

Thaksaphon (Mek) Thamarangsi MD, MPH, PhD
Director
International Health Policy Program (IHPP)
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Authors' preface to the third edition

The growing interest in alcohol policy represented by this book is part of a maturation process in the study of alcohol problems that dates back to 1975 with the publication of a seminal monograph entitled *Alcohol Control Policies in Public Health Perspective* (Bruun *et al.* 1975). Sponsored by the World Health Organization (WHO), the monograph drew attention to the preventable nature of alcohol problems and to the role of national governments and international agencies in the formulation of rational and effective alcohol policies. The most significant aspect of the book was its main thesis—the higher the average amount of alcohol consumed in a society, the greater the incidence of problems experienced by that society. Consequently, one way to prevent alcohol problems is through policies directed at reducing average alcohol consumption, particularly policies that limit the availability of alcohol. This message is no less relevant to policymakers in the current era than it was to those almost half a century ago (see, for example, Rossow and Mäkelä 2021). But much has changed since that time in the development of strategies and interventions to limit alcohol's physical, financial, and psychological availability that can be traced through a series of subsequent monographs that were inspired by *Alcohol Control Policies*.

In the early 1990s, a new project was co-sponsored by WHO to update and summarize the world literature pertaining to alcohol policy. The new study produced *Alcohol Policy and the Public Good*, a book that proved to be as thought-provoking as its predecessor (Edwards *et al.* 1994). The book concluded that public health policies on alcohol had come of age because of the strong evidential underpinnings derived from the scientific research that had grown in breadth and sophistication since 1975.

Recognizing that there was little attention being paid to alcohol policy research in low- and middle-income countries (LMICs), WHO sponsored a parallel study of *Alcohol in Developing Societies: A Public Health Approach* (Room *et al.* 2002), which used case studies in LMICs and in Indigenous societies in high-income countries (HICs) to apply much the same conceptual framework in such societies. An updated Spanish-language adaptation with a focus on Latin America was also published (Room *et al.* 2013).

Building on this tradition of multi-authored, integrative reviews of the alcohol policy literature, a new series of volumes was commissioned in 2000, based on the increasing knowledge base, the changing climate of alcohol policy, and the international trends in drinking problems. The overarching theme of that volume, *Alcohol: No Ordinary Commodity* (Babor *et al.* 2003a), evolved through careful analysis of global dimensions of alcohol-related problems and a review of the policy options to deal with it. The first edition critically reviewed 34 policies. By the time the second edition was published in 2010, a total of 43 interventions and strategies were identified and subjected to analysis (Babor *et al.* 2010).

The present volume, the third in this series, was undertaken for three reasons. First, epidemiological research on the global burden of disease continues to grow, further implicating alcohol as one of the leading risk factors for death and disability in many regions of the world. Second, the growing economic and political power of the alcohol industry and its use of new digital technologies to reach into untapped global markets have created a need to evaluate the extent to which the industry operates as an inducer of alcohol-related problems. Third, there have been major improvements in the way that alcohol policies are studied, providing new scientific evidence to inform policymakers. That evidence base has clearly established that alcohol is indeed no ordinary commodity, and that a variety of different policies, aimed at both individuals and populations, are necessary to manage the threat alcohol poses to public health and social well-being.

Work on this edition was managed over a 3-year period by an Editorial Committee (Drs Babor, Casswell, Rehm, Room, and Rossow) that communicated via fortnightly conference calls. Planning meetings were held in Utrecht, The Netherlands; Melbourne, Australia; and Dublin, Ireland. Seven background papers were commissioned and subsequently published in two peer-reviewed journals, along with accompanying editorials (Babor *et al*. 2021; Rehm *et al*. 2021a). These papers covered major epidemiological issues (e.g. unrecorded alcohol) (Lachenmeier *et al*. 2021), digital marketing developments (Carah and Brodmerkel 2021), and alcohol consumption trends (Rossow and Mäkelä 2021), as well as policy developments in Africa (Morojole *et al*. 2021), India (Gururaj *et al*. 2021), Latin America (Medina Mora *et al*. 2021), and the former Soviet Union countries (Neufeld *et al*. 2021).

This edition is thus more than an update of the prior volumes. It attempts to integrate into its 'no ordinary commodity' storyline two new themes. The first is the idea that globalization of alcohol problems is occurring for a reason, one that could be better managed if the alcohol industry abandoned its expansionist strategies into Asia, Africa, and Latin America, and if public health policy options, now numbering more than 50, were supported more vigorously by governments and civil society. The second theme is that globalization of alcohol production, trade, and marketing has created the need for a concomitant global governance mechanism to rein in a product that is now considered to be as harmful to health as tobacco.

As suggested in this brief history of a sequential series of policy monographs, in the past 50 years, considerable progress has been made in the scientific understanding of the relationship between alcohol and health and social well-being. Ideally, the research evidence should provide a scientific basis for public debate and governmental policymaking. However, much of the scientific evidence is reported in hundreds of academic publications and reports that rarely present a coherent picture of the policy implications of the cumulative literature. We therefore offer this volume as our contribution to the debate on how best to formulate, implement, and sustain effective alcohol policy. We hope that by expanding our purview and updating the science base, this edition of *No Ordinary Commodity* will continue to inform the policy debate, empower the policymakers, and apply the available research to the advancement of public policy.

A note on terminology and the glossary

Key terms that have technical and linguistic meanings that would not be familiar to the general reader are defined in a glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter. Most often, the terms refer to words or concepts used in epidemiology, alcohol research, addiction medicine, or popular culture in different parts of the world.

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Online appendices

This book is accompanied by a free online appendix to supplement some of the chapters:

- **Appendix 1:** Guidelines used for rating strategies and interventions evaluated in Chapters 7 to 13
- **Appendix 2:** Supplement to Chapter 12

These materials, where available, are noted in the book with the following icon: ⊜ and can be found online at:

oxfordmedicine.com/alcohol3e

1
Setting the policy agenda

1.1 Introduction

This book is about alcohol policy: why it is needed, how it is made, and the impact
it has on health and well-being. It is written for both policymakers and alcohol sci-
entists, as well as for many other people interested in bridging the gap between re-
search and policy. It begins by examining the premise that alcohol is not an ordinary
commodity, and it ends with the conclusion that alcohol policies implemented within
a public health agenda are capable of reducing the harm caused by ethyl alcohol, a
substance that one astute observer (Edwards 2000) called the 'ambiguous molecule'
because of its paradoxical ability both to give pleasure and to inflict pain. This book is a
journey to many places, but they all point to a final destination: a world where alcohol
is the servant of humankind, rather than the master of the lives of so many.

We begin that journey with a few vignettes gleaned from different countries,
describing how people from diverse backgrounds are affected by alcohol in dif-
ferent ways (see Box 1.1). Despite their differences, these vignettes have something
important in common—they all draw attention to the need for policies that protect
health, prevent disability, and address the social problems associated with the use of
alcohol. As indicated in Section 1.2, the search for those policies began long ago.

1.2 Alcohol policy: a short history

Early examples of local controls on alcohol production, distribution, and consumption
are found in emerging urban areas of ancient China, Greece, Mesopotamia, Egypt,
and Rome (Ghalioungui 1979). In China, Emperor Yu (2205–2198 BC) imposed an
alcohol tax to reduce consumption (Newman 2002). Greek statesmen from the sixth
century BC introduced the death penalty for drunken magistrates and required that
all wine be diluted with water before being sold at public festivals. For several thou-
sand years, innovative and sometimes punitive strategies like these were devised by
monarchs, governments, and the clergy to prevent alcohol-related problems. Among
these, the prohibition of intoxicating beverages in the Quran is perhaps the most not-
able example, in terms of its continuing influence today. In tribal and village societies,
rules limiting drinking by gender or socioeconomic status have been commonplace.
Nevertheless, it was not until the late nineteenth century that alcohol control became
an instrument of organized governmental efforts to protect public health in the non-
Islamic world, including provisions in European empires forbidding alcohol to subject
peoples. And it was not until the early twentieth century that some non-Islamic coun-
tries took an ambitious step to impose a more radical solution—total prohibition.

Box 1.1 Effects of alcohol on individuals and populations

Accidental death of intoxicated teenage boy in Brazil

In Brazil, a teenage boy joins his friends for a night of alcohol-infused revelry. They climb the ladder at the local water tower to view the night sky and the city lights. The boy slips and falls to his death, a victim of alcohol intoxication, bad luck, and ineffective alcohol control policies that allow young people to have easy access to alcohol and alcohol marketing messages to portray drinking as harmless fun. The story illustrates how the state of intoxication leads some people—especially young men—to do reckless, hazardous things that can have enormous consequences for themselves and others.

Public drinking and contagion during the COVID-19 pandemic

In the United Kingdom, the coronavirus disease (COVID-19) pandemic in 2020 resulted in temporary closure of public houses ('pubs') in one of the heaviest-drinking countries of Europe. When they reopened several weeks later with new restrictions, systematic observations of patrons and staff (Fitzgerald *et al.* 2021) identified major risks of virus transmission arising from non-compliance in some venues. Observed incidents included singing, shouting, and customers shaking hands, embracing others, and moving around the bar without social distancing. The degree of alcohol intoxication was observed to contribute to most of these incidents.

Deaths and injury from methanol-adulterated alcoholic beverages in Africa

In Kenya's capital Nairobi, a home-made alcohol product fortified with methanol killed 121 people in November 2000, leaving 495 hospitalized, 20 of whom suffered blindness (Nordwall 2000). The toll was particularly pronounced in urban slums surrounding the city where unlicensed cafés serve illegal brews to rural migrants seeking employment in the city. In Uganda's Kabale District, 80 people died from multiple organ dysfunction syndrome after drinking *waragi*, an illegal banana gin adulterated with methanol, over a 4-week period in 2010 (*Herald Sun* 2010). Policies restricting illicit alcohol distillation and the unlicensed sale of alcoholic beverages have been difficult to enforce in both countries; however, simpler measures directed at control of access to methanol could be just as effective.

Year-end partying in Japan

In Tokyo, the headline of a newspaper article read: 'Year-Ending Parties Pour Drunks onto Trains of Japan', referring to the *bonenkai* New Year's holiday season. Railway officials estimated that at least 60% of passengers are intoxicated during this period. In response, extra security guards were hired to minimize injuries and 'women-only' railway cars were introduced to prevent sexual assaults. The article made no mention of whether the policies had their intended effects (Zielenziger 2000).

> ### Indigenous-led alcohol control policies in Australia
> In Tennant Creek, Australia, Aboriginal groups successfully lobbied for restrictions on payday alcohol sales, 4-litre cask wine, and hours of takeaway sale. The 'Thirsty Thursday' policy was associated with a reduction in alcohol-related police incidents, hospital admissions, and women's shelter presentations. During the same period, alcohol consumption decreased by 19% (Brady 2000).

Between 1914 and 1921, laws prohibiting the manufacture and sale of all or most forms of beverage alcohol were adopted in 13 self-governing countries (Schrad 2010), including the United States, Canada, Norway, Iceland, Finland, and Russia. Most of these laws were repealed within a decade and replaced by less extreme regulatory policies. To view alcohol policies through the narrowly focused perspective of prohibition, however, is to ignore the fact that most policymaking during the past century has been incremental, deliberate, and based on an acceptance of the legal availability of alcoholic beverages. Nevertheless, total alcohol prohibition still remains a crucial part of some government policies, mostly in Islamic countries and a few states of India.

Measures affecting alcohol consumption are now a common feature of legal and regulatory systems throughout the world. All governments have to deal with alcoholic beverages as consumer goods in one way or another, but at the same time, alcohol is seen as a subject for special regulation in the interests of public health and social well-being. These regulations have taken different forms in different countries.

In Europe, alcohol policy in the Nordic countries during the 1950s was based on social welfare and public health considerations. Policies included high excise duties on alcoholic beverages, comprehensive state alcohol monopoly systems for production and trade, and strict controls on alcohol availability (Room and Tigerstedt 2008). In contrast, there were very few alcohol control policies in the Mediterranean wine-producing countries up to the early 1950s, and most measures were motivated by industrial or commercial interests. Some countries between the Nordic and Mediterranean areas, like Ireland and the United Kingdom, developed a strict licensing system, especially for on-premises sales of alcoholic beverages. Since the formation of the European Union (EU), there has been a convergence of policies in some areas of alcohol control. In particular, regulation of alcohol production, distribution, and sales has decreased in northern EU member states, while measures targeted at alcohol demand, like alcohol advertising restrictions and drink-driving countermeasures, have become more prevalent in southern member states. In the EU, there have also been converging policies with regard to taxing alcoholic beverages, stemming primarily from EU pressures to lower taxes in member states with high taxation rates (Österberg 2011), although substantial differences remain (Angus *et al.* 2019).

In North America, there has been a gradual loosening of alcohol control in most jurisdictions in recent decades, with major changes such as privatization of alcohol retail sales occurring in several US states and a Canadian province (Ye and Kerr 2016). The relative price of alcohol has decreased because alcohol taxes have not been raised to match inflation (Blanchette *et al.* 2020). Both countries have lax controls on alcohol advertising, especially in the United States. In contrast, there

are extensive education and law enforcement efforts to control **alcohol-impaired driving.**[1]

In other parts of the world, the collapse of the communist system in the former Soviet Union and in many Eastern European countries meant that control of alcohol availability, at least initially, was greatly diminished in these countries (Moskalewicz 2000; Reitan 2000; Neufeld *et al.* 2021). However, in the last decade, in part stimulated by the recognition that the region had some of the highest levels of alcohol-related harms in the world, stricter alcohol control policies have been implemented, leading to a decline in alcohol-attributable disease and social harm and contributing to a significantly increased life expectancy (Neufield *et al.* 2021). This remarkable progress was achieved in Russia, Lithuania, and some other Eastern European countries by a combination of restrictions on alcohol availability and marketing and increased alcohol taxation.

Despite these signs of progress, general alcohol policies affecting the whole population and oriented to the collective good have been under sustained attack in many **high-income countries** (HICs). Existing policies have been gradually weakened or dismantled (e.g. privatization of monopolies, erosion of taxes by inflation, extension of opening hours, and allowing alcohol to be sold in supermarkets). Marketing of alcohol has been largely unregulated and the expansion of digital marketing has increased its ubiquity and influence. At the same time, popular concern about alcohol-related problems has often risen, although it has only sporadically found political expression. The rise in public concern partly reflects an increase in the rates of alcohol-related problems in areas such as alcohol-impaired driving. Public health advocacy, as well as scientific documentation of the hidden ways that drinking harms the drinker and others in the drinking environment, has also contributed to this growing concern (World Health Organization 2010).

Greater research attention is now being paid to policy trends beyond HICs (e.g. Room *et al.* 2013), and a tool designed to measure the implementation of effective alcohol policy in both **low- and middle-income countries** (LMICs) and HICs has been developed (Casswell *et al.* 2018). Thailand has emerged as a model for implementing effective alcohol policy by establishing a health promotion agency funded by alcohol taxes and passing a relatively comprehensive Alcohol Control Act in 2008 (Sornpaisarn and Rehm 2020). The plateauing of alcohol per capita consumption in Thailand after implementation of these alcohol control policies indicates that it is possible to slow the overall upward trend in consumption associated with economic growth (Rehm *et al.* 2021).

Elsewhere, policy developments have not kept pace with growing incomes and expanding availability and marketing. In China, the national alcohol monopoly, which exercised a moderating influence on alcohol availability, was abolished in the 1980s, succeeded by a system of limited controls divided among different ministries and levels of government (Guo and Huang 2015). **Alcohol per capita consumption** more than doubled between 1978 and 2010, followed by a sharp rise in alcoholic liver disease rates (Huang *et al.* 2017). Moutai, a spirits producer owned primarily by a Chinese

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[1] Key terms that have technical or linguistic meanings with which the general reader would not be familiar are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

local government, is now one of the world's largest alcoholic beverage companies (Koh Ping and Chiu 2021). In India, where there are marked differences between the states in the control of alcohol (ranging from total prohibition to production subsidies), alcohol policies have not been able to slow down the trend of increasing consumption (Gururaj *et al.* 2021).

In Muslim-majority countries (MMCs), religious injunctions and beliefs are associated with lower alcohol consumption and fewer alcohol-attributable problems. However, consumption overall has increased, compared to two decades ago, in the context of globalization, including the influence of tourism and migrants from non-Muslim countries, as well as the engagement of **transnational alcohol corporations (TNACs)**, which have identified MMCs as a growth area (Al-Ansari *et al.* 2016).

In sub-Saharan Africa, attempts to implement stricter alcohol control policies in the face of increasing problems have encountered opposition from TNACs (Morojele *et al.* 2021), which have expanded their production, marketing, and distribution activities in the region (e.g. Van Beemen 2019). While the majority of the population in sub-Saharan Africa are lifetime abstainers, among drinkers, alcohol consumption is higher than in Europe. Most countries have implemented tax policies, but few have adopted other cost-effective alcohol control measures.

In South America, some alcohol control policies have been successful at the country or local level (Medina-Mora *et al.* 2021), reflecting the impact of alcohol tax increases and measures restricting availability. In addition, drink-driving countermeasures have been found to reduce traffic injuries when implemented with sufficient enforcement. On the other hand, implementation of alcohol screening and brief intervention programmes throughout the health care system has yielded mixed results (Ronzani *et al.* 2008).

In the context of increasing wealth and economic prosperity in rapidly developing regions of the world, several conclusions can be drawn. First, alcohol use continues to be a major risk factor for accidents, injuries, and non-communicable diseases globally. Second, there has been a gradual relaxation of alcohol control policies in HICs, whereas stricter controls in Russia and several Eastern European countries have met with some success. Third, expanding economies of Africa, Latin America, and Asia have led to increased alcohol consumption, but opposition from the alcohol industry has prevented the adoption of policies likely to reduce consumption.

These considerations about the current policy landscape become particularly important for public health because of the global trends in alcohol consumption that are reviewed in Chapter 3 of this book. Between 1990 and 2017, global adult per capita consumption increased from 5.9 litres per capita to 6.5 litres, and by 2030, they are forecast to reach 7.6 litres (Manthey *et al.* 2019), with much of the increase occurring in several middle-income countries such as China, India, and Vietnam.

1.3 Alcohol policy defined

In 1975, Kettil Bruun and his colleagues defined alcohol control policies as all relevant strategies employed by governments to influence alcohol availability, assigning health

education, attitude change, and informal social control as beyond the scope of a public health approach (Bruun *et al.* 1975). In 1994, Griffith Edwards and his colleagues provided a broader view of alcohol policy, defining it as a public health response dictated, in part, by national and historical concerns (Edwards *et al.* 1994). The present volume borrows from its predecessors in its conceptualization of alcohol policy, but also expands the definition, in keeping with nationally and internationally evolving views of public health.

Public policies are authoritative decisions made by governments through laws, rules, and regulations (Longest 1998). The word 'authoritative' indicates that the decisions come from the legitimate purview of legislators and other public interest group officials, not from private industry or related advocacy groups. When public policies pertain to the relation between alcohol, health, and social well-being, they are considered alcohol policies. Thus, drink-driving laws designed to prevent alcohol-related accidents are considered alcohol policies. We focus on the public health purpose of policy-relevant laws, recognizing that a law can have multiple purposes. For example, alcohol excise taxes produce revenue for the state, while at the same time helping to limit excessive drinking. In some cases, interventions are promoted or conducted by the alcohol industry as substitutes for government policies such as voluntary self-regulation of alcohol marketing and designated driver programmes. Where these programmes have been evaluated from a public health perspective, they are included within our review of the literature on policy options, but they should not be considered alcohol policies unless they constitute government-sanctioned laws, rules, or regulations.

From the perspective of this book, the central purpose of alcohol policies is to serve the interests of public health and social well-being through their impact on determinants of problems from alcohol. Policies can be directed toward total alcohol consumption in a population, the drinking and marketing environment, and affordability and physical availability of alcohol, as well as other areas. An important response to alcohol harm is access to health and social services, particularly those designed to deal with alcohol dependence and alcohol-related social and psychological problems. The alcohol treatment and preventive services available to people within a country are greatly influenced by the financing of health and social services, both at a general level and in terms of support for specialized services.

1.4 Public health, public interest, and the public good

The last three decades of the twentieth century saw the rise of what has been termed in the alcohol literature the 'new public health' approach to alcohol issues (Room 2021), which brings together several strands of research and philosophy. In contrast to a primary focus on a unitary disease, 'alcoholism', the approach includes a broader variety of alcohol-related problems, and segments of the population that go beyond the heaviest drinkers, to include all drinkers who are at risk, experience harms or have potential for causing harm to others. The majority of drinkers are part of this approach, not only because they occasionally experience harms associated with acute intoxication or regular drinking, but also because they contribute to the social climate

that facilitates heavy drinking. The proportion of heavy drinkers in the population is strongly associated with the overall level of consumption of the population generally; thus, part of a society's overall 'alcohol policy' is to place limits on availability to reduce overall consumption, not just consumption by heavy drinkers (Bruun *et al.* 1975; Rossow and Mäkelä 2021). The focus on population-level drinking has had considerable influence on alcohol policies in many parts of the world, as well as on the policies recommended by the World Health Organization; however, it has been opposed by the alcohol beverage industry because the population focus provides broad justification for government regulation.

An alternative approach that has been embraced at least partially by the alcohol industry, as well as by the public health community (Stockwell *et al.* 1997), argues that harm reduction policy measures directed at heavy and problematic drinkers are more politically acceptable, and therefore more feasible, than measures directed at all drinkers. This approach primarily focuses on reducing instances of intoxication or insulating the drinker from harm. As noted in previous editions of this book, there is usually no conflict between approaches aimed at total consumption and those aimed at harm from heavy drinking. Measures that affect the entire drinking population— alcohol taxes, for example—may even be more effective with heavier drinkers in terms of reducing alcohol-related harms.

The definition of alcohol policy proposed in this book relies heavily on concepts derived from public health, a specialized field of knowledge and action that is not always understood by either the general public or the health profession. Public health is concerned with the management and prevention of diseases and injuries in human populations. Unlike clinical medicine, which focuses on the care and cure of disease in individual cases, public health deals with population health at community, country, or broader levels.

Why are public health concepts important to the discussion of alcohol policy? During the twentieth century, public health and related social well-being measures have had a remarkable effect on the health of populations throughout the world. Life expectancy has increased dramatically during this period, thanks partly to the application of public health measures designed to improve sanitation, reduce environmental pollution, and prevent communicable and infectious diseases (World Health Organization 1998). But even as epidemics of most communicable diseases have receded, health risks associated with the commercial determinants of chronic diseases and acute health conditions have increased in importance as major causes of mortality and morbidity (Moodie *et al.* 2013). When population approaches are used instead of, or in conjunction with, individual-level approaches, the effects on health can be dramatic, as demonstrated in the Russian Federation where changes in alcohol policy in recent years have been associated with improvements in life expectancy (Nemtsov *et al.* 2019). As this book will show, public health concepts provide an important vehicle to manage the health of populations in relation to alcohol use. Whereas approaches oriented toward individuals can be effective in treating alcohol dependence and alcohol-related disabilities (Chapter 13), population-based approaches deal with groups, communities, and nation states to modify or remove the determinants of alcohol-related problems.

A related perspective that expands the application of public health concepts to alcohol problems is social well-being. This perspective goes beyond medical and health

concerns to include quality of life dimensions such as personal safety, rewarding leisure activities, economic security, and life satisfaction (Maccagnan *et al.* 2019), all conditions that are threatened by excessive alcohol consumption. Recognizing that alcohol problems involve dimensions other than physical health and often affect others than the drinker, the social well-being approach aims to reduce the social consequences of drinking, including interpersonal problems, marital discord, employment difficulties, alcohol-impaired driving, and alcohol's harm to others.

This expanded public health/social well-being approach establishes the basis for a broad agenda for alcohol policy. A narrower scope would only extend to prevention of problem drinking and treatment of alcohol use disorders, thereby confining the problem to defects in the individual drinker. Throughout history, there has been a tendency to adopt a moral stance in considering alcohol problems as the result of bad choices by culpable individuals. Instead, our approach considers the harms from alcohol as partly stemming from policy decisions that treat alcohol as an ordinary commodity and from the expanding influence of the alcohol industry. Although alcohol can provide social and psychological benefits (as discussed in Chapter 2), and some protective health benefits may be associated with moderate drinking (as discussed in Chapter 4), the focus of this book is on reducing the negative impacts of alcohol use, which often outweigh the benefits of drinking for many individuals.

The pursuit of health and the promotion of social well-being are among modern society's most highly cherished values, as reflected in the inclusion of alcohol reduction targets in the United Nations' globally agreed sustainable development goals (World Health Organization 2018). However, alcohol control based on these values also creates a special challenge because it often competes with other values such as free trade, corporate profits, and individual choice. As subsequent chapters will show, sound alcohol policy enacted in the interests of public health and social well-being is well justified in the public interest because alcohol is no ordinary commodity.

1.5 The storyline of this book

The storyline of this book, epitomized in its title, has emerged over the course of almost five decades of professional collaboration among groups of authors from multiple countries and disciplines. Although the names of the authors have changed with each iteration of the various editions of this book (Bruun *et al.* 1975; Edwards *et al.* 1994; Babor *et al.* 2003, 2010), the underlying themes have grown clearer as the field of alcohol science and policy analysis has matured. The plot can be described in five thematic sections.

First, Chapter 2 explains why alcohol cannot be considered an ordinary commodity from a public health perspective. Not only is alcohol a toxic substance when taken in large amounts or over an extended period of time, but it also affects the health of the drinker through the mechanisms of acute intoxication and alcohol dependence. Alcohol exacts enormous financial and personal costs both from individual drinkers and from the people and institutions that surround them. Like tobacco and other harmful commodities, alcohol has the potential to cause harm in multiple ways. Just how many ways is the subject of Chapters 3 and 4, which deal with the nature and

extent of different drinking patterns and the resulting harms to the drinker and to others. Drinking behaviour and alcohol-related problems are influenced by a variety of factors, including the physical, social, economic, and virtual environments within which people live, as well as people's genetic make-up, personal lifestyles, and access to health services. It follows that alcohol policies, to be effective instruments of public health and social well-being, must take into account, if not operate in, all of these domains, rather than be limited to a more circumscribed focus on either alcohol, the agent, or on alcohol dependence, which is just one result of chronic drinking. These chapters show that alcohol is no ordinary commodity because of the enormous and diverse burden of harm resulting from its use.

The second theme, explored in Chapters 5 and 14, is the alcoholic beverage industry's role as an inducer of alcohol-related problems. This part of the story focuses on recent developments in the concentration of the alcohol industry into a small number of transnational corporations. It shows how the role of the industry has changed from being a producer of traditional alcoholic beverages, such as wine, beer, and spirits, to an inducer of growing demand for a wide range of alcohol products designed to increase alcohol consumption in every segment of the global population.

The third part of the storyline, presented in Chapters 6 to 13, constitutes the core of the book. These chapters review in detail the evidence supporting seven major approaches to alcohol policy: pricing and taxation measures, regulating the physical availability of alcohol, restricting alcohol marketing, education and persuasion strategies, drink-driving countermeasures, modifying the drinking context, and treatment and early intervention. Here we describe nearly 70 strategies and interventions that have been tried and tested in terms of their effectiveness in the prevention or amelioration of alcohol-related problems. Some of these policies operate on the whole of society as universal measures limiting the physical, financial, social, and psychological availability of alcohol. Others are more targeted at subgroups within the population that are either vulnerable or at risk, or in other ways negatively affected by alcohol, such as youth, people with alcohol dependence, and alcohol-impaired drivers. The research shows that while universal measures, such as pricing policies, availability restrictions, and marketing controls, are the most effective practices, many of the targeted approaches have something to contribute, especially when used in combination with universal measures or for addressing specific problems that universal measures have failed to eliminate.

Unfortunately, the storyline becomes more pessimistic in the fourth section where the challenges to effective alcohol policy are described. Chapter 14 suggests a framework to understand the alcohol policymaking process and how it can serve the interests of public health and social well-being. In this chapter, we consider the following questions. Who are the major players in the alcohol policy area? How do they contribute to the policymaking process? What is their individual and collective impact on public health and social well-being? In addition to government officials and public health professionals, non-governmental organizations and professional groups play a role in advocating on behalf of the public interest in many jurisdictions, and those who communicate research findings are often drawn into the policy debate. Increasingly, groups involved in for-profit alcohol production and sales are also involved in policy debates, often advocating for the least effective policies.

If alcohol-related problems are to be minimized, mechanisms are needed at the international, national, and local levels to ensure that alcohol policies serve the public good. To that end, Chapter 15 explores both the dark and bright sides of alcohol policy at an international level, with the former epitomized in trade agreements that often favour alcohol industry interests and adversely affect health versus policies advocated by international agencies such as the World Health Organization. Thus, for alcohol policy to use science and public health in the public interest, there will need to be supranational mechanisms to address the consequences of increasing globalization of alcohol production, trade, and marketing.

The final chapter of the book presents a synthesis of existing knowledge about evidence-based strategies and interventions that can be translated into alcohol policy. By comparing these public health options in terms of their effectiveness and amount of scientific support, it is possible to evaluate the potential contributions of different policies, both alone and in combination. As the scientific basis for alcohol policy has matured in its scope and sophistication, it has become apparent that there is no single way to address the broad spectrum of harms caused by alcohol. Nevertheless, the best practices are the ones that place restraints on the availability, affordability, and marketing of alcohol. A combination of strategies and interventions to comprehensively address these aspects of the alcohol environment is therefore needed. If this realization is sobering, so too is the conviction, argued in the pages of this book, that alcohol policy is an ever-changing process that needs to constantly adapt to the times if it is to serve the interests of public health, social well-being, and the public good.

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2

Alcohol: no ordinary commodity

2.1 Introduction

Alcohol is a psychoactive substance that has been used since antiquity as a dietary supplement, social lubricant, and intoxicant. Beer, wine, and distilled spirits are also commodities that are bought and sold in the marketplace. And alcohol is a drug with toxic effects that cause physical, social, and psychological harm. This chapter examines these different aspects of alcoholic beverages, paying special attention to the contrast between alcohol's dual role as a commodity and as a drug.

An understanding of this contrast is essential to the book's central theme. In recent years, public discussion of alcohol policies has too often ignored or downplayed the need to understand the nature of the agent, its social and psychological functions, and its harmful properties. In many societies, there is general acceptance of the idea that alcohol is an ordinary commodity that should be bought and sold like any other marketable product. This idea is reinforced by the promotional activities of the alcoholic beverage industry, especially in the areas of marketing and trade agreements (Chapters 9 and 15). As discussed in this chapter, the validity of this assumption is questioned by evidence showing that alcohol intoxication, alcohol dependence, and alcohol's toxic effects on various organ systems are key mechanisms linking alcohol consumption to a wide range of adverse consequences, including its harm to others than the drinker.

2.2 Alcohol's social, cultural, and symbolic functions

The history of alcoholic beverages shows that drinking has served many purposes for the individual and society. As Heath (1984) noted, alcohol can be at the same time a food, a drug, and a highly elaborated cultural artefact with important symbolic meanings. In contemporary societies, alcohol products are mainly used as beverages to serve with meals, as thirst quenchers, as a means of socialization and enjoyment, as instruments of hospitality, and as intoxicants.

In earlier times, alcoholic beverages were frequently used as medicine (Edwards 2000). Alcohol preparations are still listed in 'essential medicine' lists, in that they are regarded as essential and inexpensive for use as disinfectants and other (non-drinking) applications in medical environments (World Health Organization 2019). Presently, the best example of a medicinal use of alcohol is when it is consumed to protect against heart disease. Light regular consumption of alcohol (as little as a drink every second day) is associated with a reduction in heart disease, possibly through its

anti-clotting effect (Corrao *et al.* 2000), although studies have severely overestimated the protective effect (Rehm 2019). As will be seen later in this book (Chapter 4), this cardio-protective effect is seen primarily for the age group of 60 years and older, and appears not to be reflected in terms of health benefit at the population level (Roerecke and Rehm 2012).

Until the advent of clean water supplies in Europe and America in the late nineteenth century, alcoholic beverages were considered to be a healthy alternative to polluted drinking water (Mäkelä 1983). Alcoholic beverages are used in many cultures in a variety of social situations, both public and private (Heath and Glasser 2003). They are frequently used to commemorate births, baptisms, and weddings. In a religious context, the consumption of alcohol may be limited by ritual expectations, as in the Catholic mass and the Jewish Seder, where only very light drinking is condoned.

Alcohol is frequently used as a relaxant and a social lubricant. In some communities, the provision of an abundance of alcohol in social situations is almost mandatory, and is seen as a sign of wealth and power by those who provide it.

Alcohol's meanings and functions change as individuals go through different stages of life, and as societies' norms about appropriate or acceptable drinking change accordingly (Fillmore *et al.* 1991). Drinking can be a sign of rebellion or independence during adolescence, and societies across the world are concerned with the harmful consequences of drinking. Epidemiological evidence reviewed in Chapters 3 and 4 indicates that there are good reasons for this concern. Most societies, even those with very liberal policies toward alcohol consumption, agree that alcohol should not be made readily available to children and adolescents. In all regions of the world, **heavy episodic drinking**[1] peaks in the next stage of life—the age group of 20–24 years, although in some regions this can be modified by cultural factors (World Health Organization 2018).

There are also important differences in the cultural meaning of drinking for men and women. In some societies, drinking has been almost exclusively a province of men, and this remains true, for instance, in India (Room *et al.* 2002, pp. 97, 102). Though the percentage of abstainers is generally higher among adult women everywhere, in many countries in Europe, the gender difference is not great (World Health Organization 2018). Globally, women consume around one-third of the alcohol, and the remainder is consumed by men (Chapter 3).

Societies' normative expectations regarding the use of alcohol vary across age groups. In many societies, abstention rates increase in the later stages of life for both men and women (Demers *et al.* 2001; Taylor *et al.* 2007). Besides ill health, this often reflects societal norms; older people are not supposed to engage in the intoxicated partying that may be more or less accepted among the young. However, as individuals in industrialized countries live longer and healthier lives, these cultural views about the propriety of drinking by older individuals are changing, and alcohol problems are increasing in this age group (Hallgren *et al.* 2009).

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

> **Box 2.1 A deadly mix: bars, pubs, shebeens, and coronavirus**
>
> During the coronavirus disease (COVID-19) pandemic in 2020, on-premises drinking establishments, particularly bars, pubs, shebeens, cafes, nightclubs, and indoor restaurants, may have created a 'perfect storm' of risk factors that facilitated the spread of the virus. The chances of airborne transmission are increased in large indoor social gatherings, especially in contexts where there is greater proximity to others, longer exposure time, non-compliance with safety guidelines (e.g. wearing a mask), and the presence of individuals with personal risk-taking characteristics. One reason young adults became vectors for the spread of the virus in North America and Europe was relaxed regulation of bars and nightclubs. Once these drinking places were reopened after a period of closure, young adults congregated to socialize and drink. According to Dr Ogechika Alozie, an infectious disease specialist in El Paso, Texas, 'You can't drink through the mask, so you're taking off your mask. There are lots of people, tight spaces and alcohol is a dis-inhibitor—people change their behaviors.' According to a coronavirus disease (COVID-19) pandemic risk scale developed by a Texas medical association for common activities, drinking at bars was rated as the riskiest activity.
>
> *Source:* data from Stone W (2020) Deadly Mix: How Bars Are Fueling COVID-19 Outbreaks. Kaiser Health News, August 21, 2020 https://www.kalw.org/post/how-bars-are-fueling-covid-19-outbreaks#stream/0

Alcohol is thus a drug used widely in many social situations. Throughout the life cycle from youth to old age, it is associated with many positive aspects of life. It is used in traditional social rituals in many places. In some social situations, even intoxication is seen as an acceptable and pleasurable pursuit. However, these situations can rapidly change from being 'alcohol-safe' to being 'alcohol-dangerous' when bar patrons and party guests who have been drinking become belligerent or leave to drive their cars back home. Box 2.1 describes the 'deadly mix' of alcohol's social customs and rituals when they conflict with public health precautions during a global infectious disease pandemic.

2.3 Alcohol as a commodity

Alcoholic beverages are produced and distributed in four ways (Room *et al.* 2002). First, there is home brewing and craft production of both distilled spirits and traditional fermented beverages (Lachenmeier *et al.* 2021). Second, there is industrial production and distribution of commercial versions of these indigenous beverages such as *chibuku* in southern Africa, *soju* in South Korea, and *pulque* in Mexico. Third, there is local industrial production of 'international' beverages such as domestic whiskey in India and lager beer like Corona in Mexico. Fourth, there is production of branded international beverages, which are increasingly marketed on a global scale.

In many countries, the production and sale of alcoholic beverages are an important economic activity. It generates profits for producers, advertisers, and investors. It provides employment opportunities for wholesalers and retailers, brings in foreign currency from exported beverages, and generates tax revenues for the government. Alcohol is a major source of sales and profits for the travel and hospitality industries, including hotels and restaurants. For these reasons, there are many vested interests that support the continuation and growth of alcohol production and sales. It may take only a few hundred employees to operate a modern, large-scale brewery. However, when beer is sold in grocery stores or restaurants, it becomes a significant source of retail sales, which bring profits to small business owners and employment to service and sales workers. Nevertheless, the increased industrialization brought by the alcohol industry to developing societies does not necessarily lead to a clear increase in employment or expansion of the tax base (Bakke 2008).

Alcoholic beverages, particularly wine and beer, are considered agricultural products in many developed countries. Wine plays an especially important role in the economies of countries like France, Italy, and Argentina. While beer and distilled spirits also have clear connections to agriculture, in many countries, these activities come under the jurisdiction of the ministry of industry. In contrast to wine production, in developed countries, beer and especially distilled spirits are mostly produced in large plants by industrial enterprises.

Consumer spending on alcoholic beverages usually generates tax revenues, which make these products a popular source of income for local, state, and national governments. But as shown in Chapter 7, alcohol also imposes economic costs on society, including health care, policing (plus courts and prisons), crime prevention, property damage, traffic accident damage, workplace unproductivity, unemployment, and premature mortality. These costs far outweigh any potential economic advantages of alcohol taxes (Institute of Alcohol Studies 2017). Box 2.2 makes this point cogently.

In summary, alcohol is an important commodity with a complex supply chain and a considerable employment base. Taxation of alcoholic beverages brings in revenue in larger or smaller quantities to state budgets. Alcoholic beverages are, by any reckoning, an important, economically embedded commodity. But as we shall see in the remainder of this chapter, the benefits connected with the production, sale, and use of this commodity come at an enormous cost to society.

2.4 Mechanisms of harm: intoxication, toxicity, and dependence

Remarkable progress has been made in the scientific understanding of alcohol's harmful effects, as scientists also continue to uncover genetic, biological, social, and psychological explanations for humans' propensity to consume it. The adverse effects of alcohol stem from its capacities for producing physical toxicity, intoxication, and dependence.

Figure 2.1 shows the relationships between these three mechanisms of action and various types of harm that are experienced by both the drinker (the four grey-tinted boxes) and others in the drinker's environment (rectangle at the bottom). Drinking

It is known that alcohol use incurs substantial costs to society, but rarely have these costs been quantified. For Canada, these costs were estimated for the year 2014 to be $14.6 billion in Canadian dollars (CAD), with lost productivity ($5.9 billion CAD), costs to the health care system ($4.2 billion CAD), and costs for the criminal justice system ($3.2 billion CAD) being the largest contributors (Canadian Substance Use Costs and Harms Scientific Working Group 2018).

On the other hand, the government generated revenues from the sale of alcoholic beverages, in the form of federal excise tax, net income from provincial liquor authorities, and sales tax, as recorded by Statistics Canada (Statistics Canada 2020). For the same year 2014, these revenues would have amounted to $10.9 billion CAD overall, leaving a net deficit to Canadian society of $3.7 billion CAD. The net deficit was highest in Alberta, a province with a privatized alcohol distribution system. In sum, the federal and state revenues cannot make up for the—conservatively estimated—costs of alcohol use. Following the classic economic logic of **Pigouvian**, taxes should be increased in this case to account for externalities (Pigou 1920; see also Sornpaisarn *et al.* 2017).

Source: data from Sherk A (2020) At-a-glance-The alcohol deficit: Canadian government revenue and societal costs from alcohol. Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice, 40(5–6), 139.
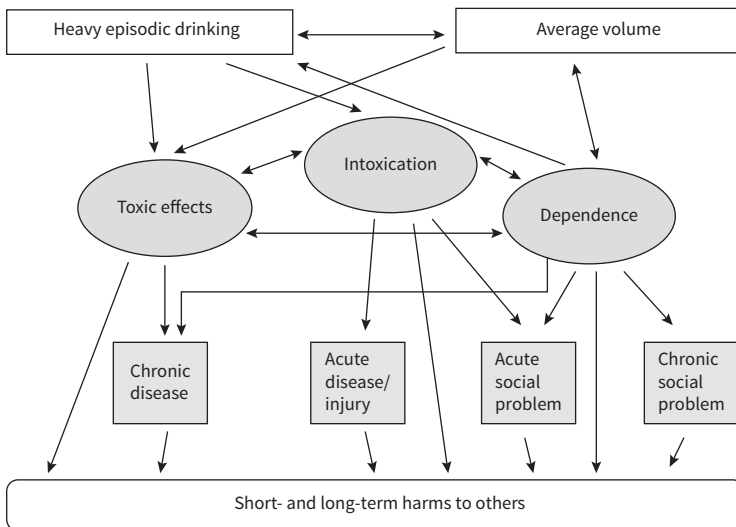

Figure 2.1 Schema of relationships among alcohol consumption (upper-level rectangles), mechanisms of action (mid-level ovals), and short-term, as well as long-term, consequences for the drinker and for others (bottom-level boxes). Arrows indicate direct and reciprocal influences.

patterns are characterized not only by the frequency of drinking and the quantity per occasion, but also by the variation between one occasion and another. The figure focuses on two aspects of the drinking pattern particularly associated with negative consequences: heavy drinking occasions and the average volume of consumption. Different patterns can lead to different types of problems. Sustained heavy drinking, of the type that has been common in wine-drinking countries, may not lead to much evident intoxication but can cause tissue damage and dependence. Daily drinking of even moderate amounts of wine per occasion over a long period of time can lead to cirrhosis because of the cumulative effects of alcohol on the liver. In contrast, a relatively low frequency of drinking, together with consumption of a high number of drinks per occasion, can lead, through the mechanism of acute intoxication, to a variety of medical and social problems, including harm to others such as accidents, injuries, and interpersonal violence. Finally, sustained drinking may result in alcohol dependence. Once dependence is present, it can feed back to increase or sustain both the overall volume of drinking and the occurrence of heavy drinking occasions. Dependence can then lead to chronic medical problems, as well as to acute and chronic social problems.

2.5 Alcohol as a toxic substance

Alcohol is a toxic substance in terms of its direct and indirect effects on a wide range of body organs and organ systems. Some of alcohol's adverse health impacts can result from acute intoxication or **binge drinking**, even in a person who does not have a long-standing or persistent drinking problem. These include alcohol poisoning, acute pancreatitis, and acute cardiac arrhythmias. On occasion, some of these conditions may have fatal outcomes. Another category of harm can be designated as 'acute and chronic'. For example, a drinking binge in a chronic heavy drinker may turn liver impairment into liver failure or cause an acute onset of brain damage.

A third category of harm is chronic disease resulting from long-term exposure to high doses of alcohol, with cancers and cirrhosis being prime examples. There is clear evidence for a causal role of alcohol in various cancers, including cancer of the mouth, oesophagus (gullet), larynx, and pharynx (Rehm *et al.* 2020), as well as cirrhosis of the liver, diseases of the heart muscle, cardiac arrhythmias, pancreatitis, and hypertension (Chapter 4).

Heavy drinking by pregnant women can result in a range of damage to the fetus (Lange *et al.* 2017). The term **fetal alcohol spectrum disorders** (FASD) describes a continuum of permanent birth defects, which, in the extreme form, are called **fetal alcohol syndrome**, characterized by hearing disabilities, retarded growth, and heart disorders, together with certain characteristic facial abnormalities.

In summary, alcoholic beverages are consumer products with many customary uses and social functions. They are also commodities important to many people's livelihood. However, social customs and economic interests should not blind us to the fact that alcohol is a toxic substance. It has the potential to adversely affect nearly every organ and system of the body. No other commodity sold for ingestion, not even tobacco, has such wide-ranging adverse physical effects. Taking account of alcohol's potential for harm is therefore an important task for public health policy.

> **Box 2.3 Types of impairments that occur with alcohol intoxication**
>
> - *Psychomotor impairment*. Alcohol can impair balance and movement in a way that increases the risk of many types of accidents.
> - *Lengthened reaction time*. This classic dose-related impairment is of particular concern because of its causal role in traffic accidents.
> - *Impairment of judgement*. Impaired judgement can result in dangerous risk-taking such as getting into a car and then driving in a risky and aggressive way when intoxicated.
> - *Emotional changes and decreased responsiveness to social expectations*. The factors involved in alcohol-related changes in mood, emotional state, and social responsiveness are complex and are likely to involve interaction of alcohol's physiological effects with psychological and social factors. In part, because of these changes, intoxication can contribute to the risk of violence to others and intentional self-harm.
>
> *Source:* data from Eckardt MJ, File SE, Gessa GL, et al. (1998) Effects of Moderate Alcohol Consumption on the Central Nervous System. Alcoholism: Clinical and Experimental Research 22(5), 998–1040.

2.6 Alcohol intoxication

There is a popular tendency to view all problems related to drinking as part of, or due to, **alcoholism** or, in current terminology, alcohol dependence. Studies of drinking practices and problems in the general population question this assumption, showing a universe of drinking problems that lie outside the bounds of alcohol dependence (Chapter 3).

One of the main causes of alcohol-related harm in this context is **alcohol intoxication**, defined here as a short-term state of functional impairment in psychological and psychomotor performance induced by the presence of alcohol in the body. The major types of impairments (other than acute toxicity) that occur with alcohol intoxication are described in Box 2.3. Impairments produced by alcohol are mostly dose-related and involve multiple body functions. Some (such as slurred speech) are evident and easily recognized, whereas others, such as impaired driving ability, may be subtle and picked up only on laboratory testing. Some of these effects stem directly from a given **blood alcohol concentration**, whereas others depend on personal characteristics, the individual's previous experience with alcohol (called tolerance), and the setting and expectation of effect. Other psychoactive drugs, especially central nervous system depressants, may exacerbate the effects of alcohol when taken concomitantly.

As Box 2.3 indicates, intoxication and accompanying changes in behaviour are a matter of cultural and personal expectations and understandings, as well as of the concentration of alcohol in the blood. The anthropological literature has long recognized that there are striking differences among cultures in drunken comportment (MacAndrew and Edgerton 1969; Room 2001). Even within a given culture, the

meaning of 'drunk' can change over time. In 1979, when alcohol consumption levels in the United States were achieving record levels for the twentieth century, adult males reported that it would take an average of 9.8 drinks (about 118 g of ethanol) for them to feel drunk, and 5.4 drinks to feel the effects of drinking. In 1995, after consumption levels in the United States fell by 21%, men reported that it would take an average of 7.4 drinks to feel drunk and 4.6 to feel the effects (Midanik 1999). The amounts also fell for women, from 5.7 to 4.7 drinks to feel drunk and from 3.7 to 3.2 drinks to feel the effects.

Intoxication, occasional or regular, is a key risk factor for the adverse consequences of drinking, which, in some cases, might also involve dependence. However, just as behavioural changes associated with intoxication are influenced by social and cultural expectations, so too is the link between intoxication and adverse harms, especially social harms. These types of harms have been defined as a failure to fulfil major social obligations associated with family, job, and public demeanour (Room 2000). Social reactions to intoxication are a key part of the mechanism by which social harms (e.g. public drunkenness, drinking and driving, job-related problems, and family problems such as separation and divorce) are recognized by society. In places where drinking is a daily, or almost daily, activity of many, and where even some heavier drinking is accepted in special circumstances (e.g. weddings, carnival), reactions to intoxication may take some time to develop, and so will related social harms. In other places, such as 'dry' cultures where most people do not drink and rules against intoxication are strict, reactions to small behavioural changes associated with drunkenness may be swift and severe, leading to social harms for intoxicated drinkers and those around them.

Social harms arise not only from the general environment where drinking takes place, but also from the characteristics and circumstances of the drinker. A drinker can only have an alcohol-related problem with a spouse if the drinker is married. Job problems will arise primarily when the person is employed and the work being done is closely supervised by others. The drinking problems of a salesperson who works from home may go undetected for quite some time, which would not happen with someone who works regular hours in an office environment side by side with others. Social harms also affect the drinker's immediate social network—co-workers, relatives, and friends (see Chapter 4 for more discussion of harm to others). Social harms can also have a collective effect on society as a whole. Lost productivity in the workplace has such a general effect. Public intoxication, violence and driving after drinking require responses by the police and legal system, which come with considerable budget expenditures. These behaviours also affect a community's general sense of security and safety. As will be seen in Chapter 4, the link between intoxication and adverse social consequences is clear and strong for social harms such as violence, traffic casualties, and other injuries.

The following conclusions can be derived from the research on alcohol intoxication:

1. Alcohol is a psychoactive substance that can impair motor skills and judgement. Impairment from intoxication is biological, but its manifestations are affected by expectancies, cultural norms, and the environment.
2. Occasional drinking to the point of intoxication is quite common among drinkers. Intoxication, even when it occurs infrequently, can result in substantial

injury and social harm. In fact, the chances of harm from a single intoxication event seem to be higher for those who drink infrequently than for those drinking more frequently (Hurst *et al.* 1994; Room *et al.* 1995).

3. Preventing alcohol intoxication is a potentially powerful strategy for preventing much of the harm from alcohol.

4. Since the link between intoxication and harm is very much affected by the social and physical context, harm can also potentially be averted by insulating the drinking behaviour. This can take many forms, e.g. physical (making the place of drinking safer) or temporal (separating the drinking from activities requiring vigilance).

5. The variety and complexity of social harms, their inherent interactional nature, their effects on individuals, and their collective effect on society point to the need for prevention policies that are also varied in nature and environmentally and contextually based.

2.7 Alcohol dependence

In 1976, Edwards and Gross (1976) proposed the concept of the **alcohol dependence syndrome**. Alongside this new conceptualization in terms of a core set of indicators, it was also noted that alcohol-related problems could occur without dependence, but that dependence was likely to carry with it many additional problems. The overall formulation was intrinsically two-dimensional. One dimension is that represented by the syndrome concept, which refers to a cluster of interrelated physiological and psychological symptoms in which alcohol use takes on a much higher priority than other behaviours. The second dimension—alcohol-related problems—refers to harm resulting from drinking, regardless of whether the person is alcohol-dependent. The syndrome concept has been officially recognized in the International Classification of Diseases (ICD) in its tenth (ICD-10) and eleventh revisions (ICD-11) (World Health Organization 1992; Saunders *et al.* 2019). In ICD-11, at least two of three criteria must have been present in the past 12 months: impaired control over alcohol use; alcohol as an increasing priority in life, taking precedence over other activities; physiological features—tolerance of increased dosage, withdrawal symptoms, or drinking to prevent or relieve withdrawal (see Box 2.4).

Prevalences of alcohol use disorders (AUDs) in the general population have been estimated by means of the World Health Organization (WHO) World Mental Health Survey Initiative, which allows comparison of the prevalences and associated factors of AUDs in a large number of countries. Across all these sites, the average lifetime and 12-month prevalences of alcohol dependence were 2.3% and 0.8%, respectively (Glantz *et al.* 2020).

Two factors contributing to the development of alcohol dependence are reinforcement (negative and positive) and neuroadaptation (Gilpin and Koob 2008). Reinforcement occurs when a stimulus (e.g. alcohol-induced euphoria or stimulation) increases the probability of a certain response (e.g. continued drinking to maintain a rising blood alcohol level). Neuroadaptation refers to biological processes by

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Box 2.4 Classification of alcohol dependence and harmful pattern of use in ICD-11

Alcohol dependence is a disorder of regulation of alcohol consumption arising from repeated or continuous use of alcohol. In ICD-11 dependence is defined in terms of three criteria, any two of which have to have been present for more than 12 months (or continuous use for a month): (1) impaired control, which may or may not be accompanied by craving; (2) increasing priority for alcohol taking precedence over other interests; and (3) physiological tolerance to the effects of alcohol, withdrawal symptoms following cessation or reduction in use of alcohol, or repeated use of alcohol or pharmacologically similar substances to prevent or alleviate withdrawal symptoms. The features of dependence are usually evident over a period of at least 12 months.

Harmful pattern of use is repeated use of alcohol in ways that cause damage to a person's physical or mental health, or regular use that has resulted in harm to the health of others. The pattern of alcohol use is evident over a period of at least 12 months if the drinking is episodic or at least 1 month if use is continuous. Harm to health of others includes any form of physical harm, including trauma, or mental disorder that is directly attributable to behaviour related to alcohol intoxication on the part of the person to whom the diagnosis of harmful pattern of use of alcohol applies.

Source: data from Saunders JB, Degenhardt L, Reed GM, et al. (2019) Alcohol Use Disorders in ICD-11: Past, present, and future. Alcoholism: Clinical and Experimental Research 43 (8) 1617–31, doi. org/10.1111/acer.14128.

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which initial drug effects are either enhanced or attenuated by repeated alcohol use. Acute reinforcement occurs because alcohol interacts with neurotransmitter systems, which are part of the brain reward circuitry. Alterations in this system persist after acute withdrawal and may increase vulnerability to relapse. The remarkable advances in neurobiological research point to alcohol's psychoactive properties as a critical feature in the development of alcohol dependence.

A number of studies have examined the relationship between drinking patterns and alcohol dependence. The more a population engages in sustained or recurrent heavy alcohol consumption, the higher the rate of alcohol dependence (Rehm and Eschmann 2002). The prevalence rate of alcohol dependence thus varies according to the level of drinking in the general population. Patterns of drinking and a variety of social, psychological, and biological characteristics of the population may also affect dependence rates.

Both the average volume of drinking and the **pattern of drinking** larger amounts on an occasion are related to the prevalence of dependence (Caetano *et al.* 1997), and the risk of dependence increases linearly with increased drinking. The nature and direction of causality, however, are not clear. Dependence may perpetuate heavy drinking, or heavy drinking may contribute to the development of dependence, or these two mechanisms may operate simultaneously.

The fact that alcohol has self-reinforcing potential is of fundamental importance to understanding the dynamics of the relationship between a population and its drinking. Alcohol is not a run-of-the-mill consumer substance, but a drug with dependence potential.

Alcohol dependence has many different contributory causes, including genetic vulnerability, but it is a condition that is contracted by exposure to, and consumption of, alcohol. The heavier the drinking, the greater the risk. The challenge to public health is to identify policies that make it less likely that drinkers will become dependent, with the consequent relative chronicity in behaviour patterns damaging to the individual and costly to society. The fact that alcohol dependence, once established, can become a rather chronic influence on drinking behaviour (one likely to generate more and more problems over the individual's drinking career) gives added cogency to the need for population-based strategies.

2.8 Conclusion

The major public health implications of the evidence reviewed in this chapter can be stated as follows. The dangers in alcohol are multiple and varied in kind and degree; some, but not all, are dose-related; they may result directly from the effect of alcohol or through interaction with other factors; intoxication is often an important mediator of harm; and dependence can significantly exacerbate the hazards and cause protracted exposure to danger. Alcohol's harm to others extends the damage caused by alcohol significantly beyond the harm done to the individual drinker. For these reasons, alcohol is not an ordinary commodity, even when it is used in moderation, because the risk of acute and chronic effects begins at low doses of alcohol.

Public health responses must be matched to this complex vision of alcohol's dual role as a commodity and as a drug. Population-level policies (universal interventions) should be considered, together with those directed at high-risk drinkers (selective interventions) and those targeting individuals who have already developed problems (targeted interventions). The responses need to reflect an improved understanding of the nature of an agent that is far from being an ordinary kind of commodity.

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3

Alcohol consumption trends and patterns of drinking

3.1 Introduction

This chapter describes alcohol consumption trends and patterns of drinking in a global perspective. The proportion of drinkers, the typical frequency of drinking, and the amount of alcohol consumed per occasion vary enormously, not only among world regions and countries, but also over time and between different population groups.

Two aspects of alcohol consumption are particularly important for comparisons across populations and across time. First, total alcohol consumption in a population is an important indicator of the number of individuals who are exposed to high amounts of alcohol. Total *alcohol per capita* consumption is, to a considerable extent, related to the prevalence of heavy use, which, in turn, is associated with the occurrence of negative effects (Rossow and Mäkelä 2021). Second, the relationship between total alcohol consumption and harm is modified by the number of drinkers in a population and by the way in which alcohol is consumed (so-called '**pattern of drinking**'[1]) (Rehm *et al.* 2017) (see also Chapters 2 and 4).

Even though surveys have been invaluable in furthering our understanding of the drinking cultures of countries and their different subgroups, they are not without errors and biases. Most surveys tend to underestimate alcohol consumption for a country, as compared with official statistics. Unfortunately, underestimation may vary between 30% and 70%, which is one of the reasons that comparisons between countries are often difficult to make with confidence (Rehm *et al.* 2021). There are some alcohol consumption measures that improve coverage, for example, asking more questions on consumption (e.g. Bloomfield *et al.* 2013), and in particular, asking beverage-specific questions within drinking locations has been found to yield the highest coverage (Huckle *et al.* 2018).

3.2 Proportions of drinkers and levels of alcohol consumption

3.2.1 Methods of estimating and reporting alcohol consumption

The proportion of current drinkers is commonly defined as the percentage in the population aged 15 years and over who have consumed alcoholic beverages in the

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

previous 12 months. Estimates of this proportion come from general population surveys. Another indicator of the level of alcohol consumption in a population is the total **alcohol per capita consumption** (APC), which is the recorded plus unrecorded alcohol consumption per capita in those aged 15 years and older within a calendar year, usually expressed in litres of pure alcohol, adjusted for tourist consumption (World Health Organization 2018). Recorded alcohol consumption is derived from official statistics and includes the commercial and taxed alcoholic beverages (World Health Organization 2018), which can be measured via sales and taxation or via production, export, and import (Lachenmeier *et al.* 2021). Unrecorded consumption includes that from a broad range of sources, for instance legal home-made alcoholic beverages, tourist imports, illegally produced or smuggled alcohol, and surrogate alcohol (Lachenmeier *et al.* 2013, 2021; World Health Organization 2018). APC is sometimes presented for current drinkers only. For some purposes, APC is converted into grams of pure alcohol per day (World Health Organization 2018).

3.2.2 Regional estimates of drinkers and drinking around the world

Our primary focus in this chapter will be on six World Health Organization (WHO) regional groups and four World Bank income groups of countries, covering the entire world. Table 3.1 shows the most salient characteristics of alcohol consumption in these different regions of the world, as of 2016. Clearly, APC was highest in Europe and the Americas, which include many **high-income countries** (HICs). In contrast, APC is particularly low in the Eastern Mediterranean region. Globally, unrecorded consumption constituted 25% of APC, with the proportion being highest in the Eastern Mediterranean region where APC is very low, and lowest in America and Europe where APC is high (Probst *et al.* 2019). Notably, within each region, there is huge variation in APC across countries. For instance, in the WHO European region in 2016, APC ranged from <1 (Azerbaijan) to >15 (Moldova), and in the African region from <1 (Mauretania, Comores) to >13 (Nigeria) (World Health Organization 2018).

   Worldwide, in 2016, 43% of the global population aged 15 years and over were current drinkers (Manthey *et al.* 2019). Among abstainers, the vast majority were lifetime abstainers (World Health Organization 2018). The proportions of drinkers vary greatly among countries and across regions; in 2016, it was more than half in three of the WHO regions—Americas, Europe, and Western Pacific—in the magnitude of one-third in Africa and South East Asia, whereas in the Eastern Mediterranean region, the vast majority were lifetime abstainers and current drinkers were about 3% (Table 3.1) (World Health Organization 2018).

   Among current drinkers, there is less variation between world regions in average consumption (Table 3.1, fifth column), and hence much of the variation in APC reflects variation in the proportion of abstainers. To illustrate this point, we compare three countries: Germany, India, and Egypt. For these countries, in 2016, APC was 13.4, 5.7, and 0.4, respectively, whereas the proportion of abstainers was 21%, 61%, and 97%, respectively. Despite these differences, the estimated consumption per drinker (in litres of ethanol per year) was of the same magnitude; 16.9, 14.6, and 14.3 litres, respectively.

Table 3.1 Indicators of level of alcohol consumption and heavy episodic drinking pattern by WHO world regions

WHO region	Among all aged 15+			Among drinkers (aged 15+)	
	Alcohol per capita (litres)	Unrecorded consumption (% of alcohol per capita)	Proportion of current drinkers (%)	Grams/day (average)	HED[a] prevalence (%)
Africa	6.3	32	32	40.0	50
Americas	8.0	14	54	32.8	41
Eastern Mediterranean	0.6	67	3	46.1	10
Europe	9.8	18	60	37.4	43
South East Asia	4.5	47	33	26.3	41
Western Pacific	7.3	22	54	30.0	41
Global	6.4	25	43	32.8	40

[a] Heavy episodic drinker: drinks 60+ grams of pure alcohol per occasion at least once a month.

HED, heavy episodic drinker; WHO, World Health Organization.

Source: data from World Health Organization (2018) Global status report on alcohol and health 2018. Geneva: WHO. http://apps.who.int/iris/bitstream/handle/10665/274603/9789241565639-eng.pdf?ua=1

In Table 3.1, the estimated consumption per drinker is converted from litres per year to grams per day, although most drinkers do not drink every day. The global average estimate of 32.8 g of alcohol per day and per drinker corresponds approximately to the following average consumption per week: almost 6 litres of beer (5% alcohol by volume), or three bottles of wine (12.5%), or one bottle of spirits (40%). Notably, this average reflects a skew underlying the distribution of consumption—most drinkers consume less than the average (see Section 3.4.2 for further elaboration).

3.3 Trends in alcohol per capita consumption

3.3.1 Description of trends

International comparisons of changes in levels of consumption over a longer period of time can only be made on the basis of recorded consumption. These comparisons thus do not reflect changes in unrecorded consumption. Looking at trends in recorded APC worldwide, there seems to have been a decline in drinking in many of the high alcohol consumption countries from the mid-1970s to the mid-2010s (World Health Organization 2018). This is particularly the case in the traditional wine-producing countries in Europe (e.g. France, Italy, and Portugal) and South America (Argentina and Chile). A decrease in recorded APC over this period is observed also in other HICs with relatively high APC, including the Republic of Korea (World Health Organization 2018).

Since the turn of the millennium, there has been an increase in APC for **low- and middle-income countries** (LMICs) on average (Manthey *et al.* 2019), including China and India (World Health Organization 2018). Overall, there was a convergence in consumption between HICs and LMICs over the past 25 years (Manthey *et al.* 2019). Projections of global APC trends from 2016/2018 to 2025/2030 suggest there will be an overall increase in alcohol consumption, due to significant increases in consumption in LMICs (Manthey *et al.* 2019; World Health Organization 2018). However, these predictions were made before the coronavirus disease (COVID-19) pandemic, which resulted in a decrease of consumption in many countries (see below and Sohi et al., in press).

Trends in APC typically show small or no changes from one year to the next. However, some remarkable and sudden shifts in alcohol consumption have taken place in recent decades that are of interest from a public health perspective. In particular, sudden downward shifts occurred in Portugal (1975–1977), Poland (1980–1982), Thailand (1984–1985), and several former Soviet Republics (1984–1987) (World Health Organization 2018). Examples of sudden upward shifts are Finland (1968–1969), Nigeria (1987–1988), and Bulgaria (1999–2001). Notably, a substantial increase in consumption, although over several years, is observed in the two most populated countries in the world—in China in the late twentieth century (Guo and Huang 2015) and in India in the early 2000s (Gururaj *et al.* 2021).

3.3.2 Explaining levels and trends in alcohol consumption

A number of factors impact on APC and contribute to variation across countries or world regions and the trends over time within countries or regions. First, economic wealth is an important factor. There is an association between affluence and alcohol consumption when comparing countries or regions cross-sectionally; the higher the *per capita* purchasing power, the higher the APC and the lower the proportion of male abstainers (Schmidt *et al.* 2010, World Health Organization 2018). Moreover, the proportion of unrecorded APC is lowest in HICs (11%) and considerably higher in LMICs (around 40%) (World Health Organization 2018). While these observations may suggest the importance of economic factors for alcohol consumption, stronger evidence is found from analyses of within-country variations over time. Reports from Sweden (Krüger and Svensson 2010) and Thailand (Shield *et al.* 2011) show strong associations between purchasing power and the level of alcohol consumption, that is, APC is higher in economic good times. Correspondingly, there are many examples of consumption decreases in response to economic crises, although empirical evidence on the impact of economic crises on alcohol consumption is mixed (De Goeij *et al.* 2015).

Religious prohibition of alcohol consumption, as in Islam, is likely a very important explanation for the overall low consumption levels in most Muslim-majority countries (MMCs); even in high-income MMCs like Saudi Arabia, APC is quite low ((World Health Organization 2018; Manthey *et al.* 2019). In recent years, however, alcohol consumption has increased noticeably in several MMCs which adopted new alcohol policies for economic reasons (Al-Ansari *et al.* 2016).

Several other factors are important for an understanding of APC trends (see Allamani *et al.* 2011, pp. 1294–5, for an overview). Some of these factors help to explain the marked reduction in APC, and in wine consumption particularly, in traditionally wine-producing countries in Southern Europe. Differential marketing for wine and beers, European Union agricultural policies, and competition from non-alcoholic drinks were among the factors suggested by Gual and Colom (1997). Another possible explanation relates to the considerable changes in work life and leisure activities over several decades, implying that drinking no longer fits into the work and leisure schedules of modern urban lives (Rehm and Room 2017).

Socio-political changes may also impact consumption levels. In Poland, APC dropped markedly from 1980 to 1981, concurrently with the anti-alcohol campaign launched by the 'Solidarity' trade union political movement. This was co-opted in the government's declaration of martial law and its institution of alcohol rationing (Moskalewicz 2000). In the former Soviet Union, a similar decrease was observed in the mid-1980s during the anti-alcohol campaign of the Gorbachev era of political changes (Reitan 2000). The Former Soviet Union countries have also, over the past decade, experienced substantial decreases in alcohol consumption, in conjunction with strengthened alcohol control policy measures (Neufeld *et al.* 2021).

In short, various factors impact the level of alcohol consumption in a society. As we will show in later parts of this book, alcohol policies can have large effects on consumption levels. It is important, however, to keep in mind that these policies are part of a set of interacting factors that influence consumption levels (Allamani *et al.* 2011). Simple comparisons of consumption levels across countries employing different alcohol policies can lead to erroneous conclusions about policy effects if this complexity is not taken into account.

3.4 Why does alcohol per capita consumption matter?

3.4.1 Relationship between APC and prevalence of heavy drinkers

There is a fairly consistent pattern of substantial effects of APC on population rates of health and social harms (Norström and Ramstedt 2005; Norström and Rossow 2016; Rossow and Mäkelä 2021) (see also Chapter 4). Thus, an increase in APC tends to be accompanied by an increase in population mortality, and particularly cause-specific mortality for causes where alcohol typically plays an important role (Rossow and Mäkelä 2021). Similar findings pertain to APC and violence rates (Rossow and Bye 2013, Rossow and Mäkelä 2021). These effects can, in part, be explained by the relationship between APC and the prevalence of heavy drinkers and the elevated risk of harms among these heavy drinkers (see Chapter 4).

Across studies, there is no single definition of 'heavy drinking', and various consumption levels have been used to distinguish 'heavy drinkers' from other drinkers. However, whatever the criterion for 'heavy drinking', there is good evidence of a close connection between APC per drinker and the prevalence of heavy drinking, that is the higher the consumption level, the higher the proportion of heavy drinkers. This is found in studies comparing populations in different countries cross-sectionally and

in studies examining within-country changes over time (Rossow and Mäkelä 2021). These studies (Rossow and Mäkelä 2021) show that when mean consumption changes, so does consumption at low, medium, and high levels. This means that a change in mean consumption is not only the result of a change in heavy drinking, but also that heavy drinkers tend to change along with others. Changes in APC per drinker can therefore typically be described as collective changes where the whole distribution of drinkers 'tends to move up and down the scale of consumption' (Skog 1985). While exceptions to this regularity are reported (Holmes *et al.* 2019; Rossow and Mäkelä 2021), it should also be noted that a strong connection between population mean and the prevalence of high-risk exposure is not particular to alcohol consumption but is found in various other health domains (Rose and Day 1990) and in other addiction areas (Rossow and Bramness 2015; Rossow 2019).

3.4.2 The distribution of alcohol consumption has more or less the same shape

The relationship between APC (or total or mean consumption) and the prevalence of heavy drinkers reflects a strong pattern in the distribution of consumption underlying the consumption mean. Across populations with very different consumption levels and drinking cultures, the distribution has a relatively fixed shape—it is smooth and skewed, with a long right tail (Skog 1985; Kehoe *et al.* 2012; Rossow and Clausen 2013) (see Figure 3.1). This relatively fixed shape of the distribution is often referred to as 'the distribution of consumption model' (Room and Livingston 2017). Using population samples from 66 countries, Kehoe and colleagues (2012) found that the consumption distribution had approximately the same shape in all countries, and that the distribution in a population could be estimated if an estimate of the proportion of current drinkers and APC was available. The public health implication of this fairly fixed shape is illustrated in Figure 3.1, which displays the consumption distribution in two hypothetical populations. Here, the consumption mean is higher for population *b* than for population *a*. If we consider heavy drinkers as those who consume above a certain limit (termed *x*), the proportion of heavy drinkers is higher in population *b* (with the higher mean consumption) than in population *a*. In other words, the fairly fixed shape of the distribution implies that an increase in mean consumption is accompanied by an increase in the proportion of heavy drinkers.

As noted earlier, there are two characteristics of the distribution of consumption; it is skewed and smooth, and both of these characteristics have important implications for public health. The skewed distribution implies that the small fraction of drinkers who drink most heavily account for a disproportionately high fraction of total consumption. For instance, in Australia, the heaviest-drinking 10% of the population consumed more than half of all alcohol consumed (Livingston and Callinan 2019). Similar findings are reported from populations in other countries, including Norway, the United States, Canada, and China (Skog 1985; Greenfield and Rogers 1999; Hao *et al.* 2004; Stockwell *et al.* 2009).

The smoothness of the distribution means that there is no clear distinction between 'ordinary drinkers' and **alcoholics** or 'very heavy drinkers'. This reflects that
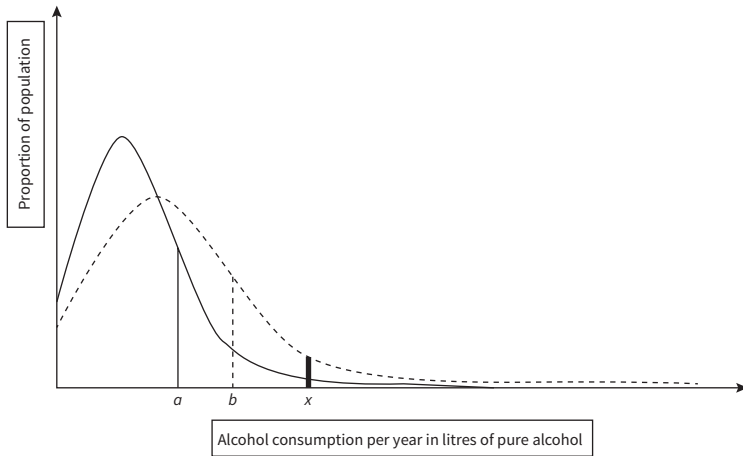
a = consumption mean for population a

b = consumption mean for population b

x = lower limit for 'heavy drinking': area under distribution curve and above x
illustrates the proportion of population that are 'heavy drinkers'

Figure 3.1 Distribution curves for two hypothetical adult populations with different levels of alcohol per capita consumption (APC).

the consumption level among the relatively few who meet the criteria for an alcohol use disorder varies considerably, as does the consumption level among other drinkers.

3.5 Drinking patterns

The term 'drinking pattern' refers to regularities in the frequency, amount, and type of alcohol consumed over a period of time and whether or not alcohol is consumed with food. Drinking patterns are important because they have a direct effect on the drinker's blood alcohol level and other aspects of a person's drinking that are likely to lead to harm.

3.5.1 Distribution of drinking occasions and intake per occasion

Total consumption can be regarded as a combination of two dimensions—drinking frequency and average quantity per occasion—each with its own distribution. Two equal distributions of total consumption may thus be composed of different combinations of drinking frequency and quantity. If regular drinking has different health effects from occasional heavy drinking, two apparently equal overall levels of drinking may lead to different outcomes.

There is a seemingly beneficial effect of a light to moderate drinking pattern involving frequent consumption of only small amounts per occasion (see Chapter 4). This type of drinking pattern is, however, rather unusual in most populations. Following Knupfer's (Knupfer 1987) notion of the myth of the daily light drinker in the United States, later studies in HICs have also found that 'daily light' drinkers are rare and those who drink daily are mostly heavy drinkers (Lemmens 1991; Paradis *et al.* 2009). The prevalence of frequent light drinkers appears to be even smaller in LMICs (Obot and Room 2005; Clausen *et al.* 2009).

3.5.2 Heavy episodic drinking

As discussed in Chapter 2, intoxication is a major mechanism through which alcohol causes harm. Intoxication results from drinking a relatively large amount of alcohol on one particular occasion, and the term **heavy episodic drinking** (HED) refers to this as a drinking pattern. To understand the implications of total consumption, we must differentiate between drinking patterns characterized by relatively frequent, as opposed to infrequent, HED events. The importance of drinking pattern applies to the population level and the individual level. The extent to which HED occurs frequently in a population has implications for the effects of APC on population harm (Rossow and Mäkelä 2021). Correspondingly, an individual's drinking pattern is decisive for how harmful a certain consumption level is likely to be (see Chapter 4). For example, risks will be quite different for a person who drinks three bottles of beer every evening and a person who drinks one bottle every day, but 15 bottles on a Saturday night, though their drinking frequency and average consumption will be the same.

Cultures vary in the extent to which HED is a characteristic of the drinking pattern. They also differ in how intoxicated people get, and how people behave while intoxicated (Room and Mäkelä 2000). The sixth column in Table 3.1 shows the considerable variation in the prevalence of HED (defined as 60 or more grams of alcohol on at least one single occasion at least once per month) among the population of current drinkers aged 15 years or older (see also Rehm *et al.* 2004).

In many cultures, HED is a particularly marked characteristic of drinking by teenagers and young adults. Data from a multinational study of drinking habits and drug use among schoolchildren provide a basis for comparisons among a selection of European countries. Table 3.2 shows that the relative significance of HED varies across countries and tends to fall into a north–south gradient across European countries. In southern European countries, a smaller proportion of drinkers have experienced HED and a smaller proportion of drinking occasions have led to HED, as compared to northern European countries.

3.5.3 Type of beverage

One important aspect of the drinking pattern is the type of alcoholic beverage consumed. As noted in Chapter 2, there are many varieties of alcoholic beverages, with

Table 3.2 Heavy Episodic Drinking by adolescents in selected European countries: rate of occurrence, and proportion of drinking occasions

Country	Data from ESPAD 2015			Data from ESPAD 2007
	Prevalence of alcohol use in past 30 days (%)	HED prevalence[a] in past 30 days (%)	Ratio of HED prevalence/ alcohol use prevalence	Ratio of HED occasions/all drinking occasions[b]
Finland	32	23	0.72	0.35
Norway	22	19	0.86	0.36
Sweden	26	22	0.85	0.30
Denmark	73	56	0.77	0.28
France	53	31	0.58	0.12
Italy	57	34	0.60	0.12

[a] HED prevalence refers to the percentage of adolescents who consume 60+ grams of pure alcohol per occasion at least once a month.

[b] HED occasion refers to the consumption of 60+ grams of pure alcohol on a single occasion.

HED, heavy episodic drinking.

Data sources: European School Survey Project on Alcohol and Drugs (ESPAD); The 2015 ESPAD Report (The ESPAD Group 2016); and the 2007 ESPAD Report (Hibell et al. 2009). Calculations presented in (Babor et al. 2010).

varying levels of alcohol content. In many places, one or two beverage types account for most of the alcohol consumption. Predominant beverage types tend to change relatively slowly in a culture. However, in many LMICs, recent economic development has often resulted in the substitution of industrial, imported alcoholic beverages for traditionally home-fermented beverages.

On a global basis and in terms of volume of pure alcohol, spirits are the most consumed beverage type, accounting for about 45% of total recorded consumption (World Health Organization 2018). The second most consumed beverage is beer (34% of all recorded consumption). Nearly everywhere in LMICs, European-style lager beer is the prestige commodity among everyday alcoholic beverages (Jernigan *et al.* 2000). This style of beer, typically promoted and produced by multinational firms or their partners, shows growth in consumption levels in most parts of LMICs. Grape wine accounts for about 12% of all recorded consumption, whereas 'other beverages', including traditional fermented beverages, such as sorghum beer, **pulque**, and **chicha**, represent about 9% of all consumption (World Health Organization 2018).

Historically, spirits drinking was often regarded as more problematic than drinking fermented beverages like wine or beer. From a health perspective, the choice of beverage seems to make little difference in terms of most long-term health consequences; it is the total amount of pure alcohol consumed, regardless of beverage type, that accounts for the toxic effects. However, spirits drinking does bring some special problems. Fatal alcohol poisoning and aggressive behaviour seem to be more strongly

associated with spirits than with other types of alcoholic beverages (Mäkelä *et al.* 2011) (see also Chapter 4).

3.5.4 The drinking context

The extent to which alcohol is consumed in public settings (i.e. pubs, bars, and restaurants), rather than in private settings, has implications for harmful consequences (particularly violence), as well as prevention strategies. Data from six European countries show differences in the proportion of drinking occasions that occur in bars or restaurants, ranging from around 10% to 25% (Leifman 2002), thus suggesting most drinking occurs in private homes. Similar findings were reported from Australia (Callinan *et al.* 2016), New Zealand, Thailand, and Vietnam where HED occurred more often in private homes (Huckle *et al.* 2020). However, surveys from 22 countries spanning all world regions provide a more nuanced picture (Bond *et al.* 2010); while drinking in private (e.g. home) settings occurs more frequently than in public settings in the majority of countries, the reverse was also observed in some countries, mainly in Latin America, Africa, and South Asia.

3.6 Distribution of drinking across demographic subgroups and over the lifespan

3.6.1 Gender

A large research literature, based primarily on survey studies of drinking habits, has consistently shown significant differences in drinking patterns between men and women, between younger and older people, and often between ethnic or religious groups.

In all world regions, lifetime abstention is more prevalent among women than among men and men are much more likely than women to be drinkers (World Health Organization 2018). Table 3.3 shows the estimated proportions of lifetime abstainers and current drinkers among men and women for each world region. Among drinkers, it is estimated that men drink significantly more than women, generally almost three times as much, and HED prevalence is also much higher among men than among women (Table 3.3). While gender differences in prevalence of any drinking at all tend to be higher in LMICs, as compared to HICs, there seems to be no such country-level income gradient in gender differences in volume of consumption (World Health Organization 2018). In a comparative study conducted in 35 countries around the world, gender differences, expressed as men/women ratios, varied markedly across countries and by drinking measure (e.g. proportions of current drinkers, HED occasions). In many countries, gender differences increased with age (Wilsnack *et al.* 2009). Correspondingly, Slade and colleagues (2016) analysed data from 68 primary studies and found that gender ratios in any alcohol use and problematic alcohol use decreased with younger birth cohorts, suggesting a gender convergence in drinking behaviour over time. Notably, the vast majority of studies were conducted in North America and Europe.

Table 3.3 Indicators of levels of alcohol consumption and heavy episodic drinking pattern by gender and WHO world regions

WHO region	Lifetime abstainers (%)		Current drinkers (%)		Total alcohol per capita among drinkers	HED[a] prevalence among drinkers (%)	
	Men	Women	Men	Women	Male/female ratio	Men	Women
Africa	45	70	44	21	2.7	61	26
Americas	9	24	67	42	2.8	53	20
Eastern Mediterranean	92	98	5	1	2.7	13	3
Europe	17	29	69	51	2.8	57	25
South East Asia	43	71	45	21	2.8	51	19
Western Pacific	26	51	67	41	2.8	53	20
Global	35	55	54	32	2.8	50	20

[a] HED: drinks 60+ grams of pure alcohol per occasion at least once a month.

HED, heavy episodic drinker.

Source: data from World Health Organization (2018) *Global status report on alcohol and health 2018*. Geneva: WHO. http://apps.who.int/iris/bitstream/handle/10665/274603/9789241565639-eng.pdf?ua=1

The considerable gender differences in volume of consumption means that men account for a disproportionately large fraction (globally 74%) of APC. Thus, a change in APC implies a larger change in alcohol exposure for men, compared to women. The markedly higher consumption among men, along with their more **hazardous drinking** pattern, suggests that men experience more health and social harms from drinking than women (see Chapter 4 for further elaboration).

3.6.2 Age groups

Alcohol consumption among young people and older adults is of particular concern, due to elevated susceptibility to harms from alcohol use in these population strata. While many countries have a legal minimum age for alcohol purchase or alcohol use (see Chapter 8), young people often have drinking experiences well before reaching the legal age (Kuntsche *et al.* 2013; Kraus *et al.* 2016) and HED occurs nearly as frequently among teenagers (15- to 19-year olds) as in the general population (World Health Organization 2018). Over the past two decades, a decline in adolescent drinking has been reported in many HICs (Pape *et al.* 2018; Kraus *et al.* 2019a) and these trends often differ from the overall trends in consumption in their respective countries. Many explanations have been offered; yet it remains unclear

how this more or less common trend across many different countries can be explained (Pape *et al.* 2018; Kraus *et al.* 2019; Vashishtha *et al.* 2019). While there is some indication that this recent lower consumption trend in adolescence has continued into young adulthood (Leggat *et al.* 2021), we do not yet know whether this applies more broadly.

Older adults are more susceptible to the negative effects of alcohol (Adams and Jones 1998; Squeglia *et al.* 2014). Factors that tend to accompany older age, including biological changes, various health challenges, and use of prescription drugs, all tend to amplify alcohol's harmful effects (Anderson *et al.* 2012; Galluzzo *et al.* 2012). Considering the elevated susceptibility to harms from alcohol with increasing age, the increase in alcohol consumption among older adults in many HICs over the past few decades (Hallgren *et al.* 2009; Anderson *et al.* 2012; Bye and Østhus 2012; Breslow *et al.* 2017) has fuelled concerns regarding public health consequences (Anderson *et al.* 2012).

3.6.3 Socio-economic status

As noted, APC tends to be higher in HICs, as compared to LMICs. Also within populations, higher socio-economic status (SES) groups (in terms of higher income, higher education level, or higher occupational status) are more often drinkers, and their frequency and volume of consumption tend, on average, to be higher than those in lower SES groups (Schmidt *et al.* 2010). This positive social gradient in alcohol exposure stands in contrast to the negative social gradient in alcohol-related harms (i.e. decreasing harm rates with increasing SES level) (Schmidt *et al.* 2010) and is often referred to as the 'alcohol harm paradox' (Bellis *et al.* 2016) (see also Chapter 4). However, **harmful drinking** patterns, including HED, seem to be more prominent in lower, as compared to higher, SES groups (Jones *et al.* 2015; Katikireddi *et al.* 2017). Yet, this probably accounts for little of the elevated alcohol harm rates in lower SES groups (Katikireddi *et al.* 2017).

3.6.4 Indigenous minority populations

Indigenous peoples are culturally distinct societies and communities, and while they are 5% of the global population, they account for about 15% of the extreme poor (The World Bank 2020). Studies of indigenous minority populations in Australia, New Zealand, and North America have shown that they often have a significantly higher alcohol intake and more HED, and thus experience more harms from alcohol, as compared to the general population (Hudson 2011; Landen *et al.* 2014; Connor *et al.* 2015; Kahukura 2015; Gray *et al.* 2018; McLaughlin and Castrodale 2018) (see also Brady 2000 for a review). While the high consumption level and hazardous pattern of drinking in indigenous minority populations are far from universal, it may, at least in part, be attributed to their history of colonialism and dispossession (Wilson *et al.* 2010).

3.7 A note on coronavirus disease (COVID-19) pandemic

In the first months of 2020, most countries globally responded to the coronavirus disease (COVID-19) pandemic and put in place a range of measures to curb the spread of the disease. Several of these measures probably affected alcohol consumption. While some measures restricted the physical availability of alcohol (see Chapter 8), particularly for on-premises consumption, restrictions on social gatherings and travelling also reduced the social availability of alcohol (Bade *et al.* 2020), and unemployment and economic losses may have reduced the affordability of alcohol for many people (Manthey *et al.* 2020). For others, the pandemic may have induced or reinforced stress and anxiety, thereby leading to increased consumption (Avery *et al.* 2020; Koopmann *et al.* 2020; Lechner *et al.* 2020). Population surveys conducted during the first phase of the pandemic demonstrated that substantial proportions changed their alcohol consumption, by either drinking less or drinking more (Callinan *et al.* 2021; Chodkiewicz *et al.* 2020; Panagiotidis *et al.* 2020; Kilian *et al.* 2021).

3.8 Summary and implications

Sales data and estimates of APC show a slight overall decrease in HICs in the new millenium. Of particular concern, however, is the increasing consumption in many middle-income countries, which may be expected to continue in the years to come.

While levels of alcohol consumption vary greatly from one part of the world to another, it appears that much of this variation is attributable to differences in the proportions of adults who abstain from drinking altogether. On a basis limited to drinkers, the consumption level varies less across world regions. This suggests that APC will increase if the proportion of abstainers decline, particularly in places where abstention is very common, as is true in many LMICs.

It is not only the level of total alcohol consumption that is relevant to the health and social problems from drinking; the drinking pattern is also of considerable importance. Thus, the same amount of consumption may be associated with quite different problem levels in different societies. The large variation in total consumption and drinking patterns across population subgroups also implies that alcohol-related problems will be very unevenly distributed within a given country.

The differences in amounts and patterns of drinking across different countries and global regions imply differences in composition and mixture of social and health problems from drinking, the issue to which we turn in Chapter 4. The differences also imply that it may be appropriate for the mixture of prevention and intervention strategies to vary from one society to another.

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4

The burden of alcohol consumption

4.1 Introduction

This chapter describes the enormous range of alcohol-attributable consequences within two broad categories: alcohol's contribution to the burden of illness carried by individuals and societies, and alcohol's harmful effects on the social fabric of families, communities, and nations. It also discusses the potential health benefits of moderate alcohol use.

Establishing that alcohol consumption is a direct cause of specific social and health problems is a task with great significance for public health. When a social or health problem is, at least in part, attributable to drinking, the evidence generally suggests specific measures to prevent or control the problem. Quantifying the strength of the relationship is an additional tool used in making decisions about policy priorities, taking into account the prevalence of the particular problem. For instance, the invention of reliable instruments to non-invasively measure **blood alcohol concentration** (BAC) paved the way for the scientific study of drink-driving behaviour. As a result, it soon became clear that drinking was implicated in a much larger share of traffic fatalities than had previously been thought. This eventually led to substantial policy changes concerning **alcohol-impaired driving**.[1]

We begin this chapter with a discussion of how epidemiologists establish causal relations between drinking and its consequences, followed by evidence on harm to the drinker and harm to others.

4.2 Measurement and inferential issues

4.2.1 The nature of health and social problems

To varying degrees, different health and social problems have both an objective element and an element that is a matter of social definition. At one end of the continuum, death can be measured objectively and reliably. However, when we want to divide deaths into different categories (or 'causes of death'), social definitions become important. For both acute and chronic causes of death, recording and coding practices often vary from country to country (Rehm and Gmel 2000; Rehm *et al.* 2017b), and most countries do not have a vital registration system. In such countries, so-called 'verbal' autopsies are conducted instead, during which relatives and others who took

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

care of the deceased in their final illness are asked about the symptoms and circumstances which led to the death (Soleman *et al.* 2006; Thomas *et al.* 2018). All collected data are then standardized to be globally comparable (GBD 2019 Risk Factors Collaborators 2020).

For health problems short of death, social definitions play an even larger role. The threshold at which a potential disability is socially noticeable, for instance, varies between cultures (Room 2001). While there has been substantial progress in international efforts to employ standard codes that are cross-culturally applicable, as in the International Classification of Diseases and Related Health Problems (World Health Organization 2018b), the apparent objectivity of the system should not obscure the fact that an element of differing social definitions remains in the categorization of alcohol-related harms.

There are few cross-nationally comparable data on alcohol-related disabilities (Goerdt *et al.* 1996; Rehm and Gmel 2000), unlike the situation with causes of death and cause-specific data on hospitalizations which have been available in many countries for many years. The paucity of data on morbidity, and particularly on disability, is problematic for estimating alcohol's role, as many health consequences of alcohol consumption are linked to non-fatal events (e.g. depression) (Rehm and Shield 2019) or to alcohol use disorders (Samokhvalov *et al.* 2010; Carvalho *et al.* 2019).

For social problems, as the term itself implies, the element of social definition becomes more prominent. Moreover, the way social matters are viewed in a given society often changes over time. In English-speaking countries, around 1900, for instance, divorce was commonly viewed as a social problem, and the then-difficult process of getting a divorce created legally defined categories for divorce such as divorce due to the partner's 'inebriety' (i.e. drunkenness). The shift in many jurisdictions in recent decades to 'no-fault divorce' abolished these categories entirely (Room *et al.* 1996).

Scientific progress depends on agreed-upon definitions and measures (Tal 2020). For this reason, the role of alcohol use as a causal factor in disease is now more clearly understood scientifically than is its causation of social harm, even though, in principle, such measurement is possible (Galea and Hernan 2020).

4.2.2 Alcohol use as a cause

As noted in Chapter 2, there are three main aspects of alcohol which contribute to harms from drinking (for further details, see Rehm *et al.* 2017a). For many chronic diseases, the primary aspect considered is the toxic effect of alcohol, operating primarily through the cumulative volume of drinking. Conversely, for injuries, the primary focus is on the amount of drinking in a specific situation, including, but not limited to, intoxication. However, both dimensions—average volume of drinking and drinking patterns—can play a role in either outcome.

In estimates of the Global Burden of Disease study (GBD 2019 Risk Factors Collaborators 2020), only the severe end of the spectrum of alcohol use disorders ('dependence' in the classification of the International Classification of Diseases, eleventh revision (ICD-11)) (World Health Organization 2018b) is considered as an outcome in the classification of mental disorders, although the full spectrum of alcohol use is

taken into account as a risk factor for other health harms. The effect of dependence on other health harms is primarily accounted for by the high volume and detrimental patterns of consumption of those drinkers classified as dependent (Rehm *et al.* 2013a).

In classifications of disease and crime, some categories are alcohol-specific, indicating that all of these events would not have occurred in the absence of alcohol (see Rehm *et al.* 2017a for more details). For instance, the category of 'alcohol poisoning' in the ICD indicates this situation specifying a necessary and sufficient causal role of alcohol in death or injury. The **'attributable fraction'** (i.e. the proportion of cases in the category assumed to be caused by drinking) is thus set at 1.0 or 100% for these conditions. However, the causal attribution built into these categories is substantially influenced by social factors. The doctor or health worker making the attribution to alcohol use may be overly sensitive to a potential alcohol attribution. More commonly, however, alcohol's involvement in a death may be missed by those certifying the death or may be deliberately not mentioned to protect the reputation of the deceased. Thus, a landmark study of death-recording practices in 12 cities in ten countries found that the number of deaths assigned to the ICD category 'liver cirrhosis with mention of alcoholism' more than doubled after additional information obtained from hospital records and interviews with attending physicians and family members was taken into account. The majority of the new cases were previously coded in categories such as cirrhosis without any mention of alcohol use (Puffer and Griffith 1967). Underestimating alcohol-attributable disease continues despite improved coding procedures in ICD-11 (see a short overview of recent studies in Rehm *et al.* 2017a, b).

For other categories of death, disease, disability, or social problems, alcohol's involvement may be a matter of increased probability, rather than certainty, based on the fact that alcohol's causal role in social and health problems is usually contributory, being only one of several factors combining to produce the problem. For example, hepatitis and malnutrition may be involved in a cirrhosis death, as well as drinking. Ice on the road and poor street lighting may play a causal role in a traffic crash, along with drinking by the driver. The minimum threshold for causation which is of interest to epidemiologists depends on the answer to the following question: would the event or condition have occurred in the absence of drinking?

While the causal status of the relationship between alcohol use and health outcomes often depends on the plausibility of potential biological pathways, the causal status of the relationships between alcohol use and social harm cannot usually be determined in this manner. There are exceptions, however, such as alcohol-impaired driving or aggressive behaviours. Thus, a causal link between alcohol intoxication and aggression has been supported by epidemiological and experimental research, as well as by research indicating specific biological mechanisms linking alcohol use to aggressive behaviour in the drinker (Rehm *et al.* 2003; Giancola 2013). However, there is less evidence for the causal role of alcohol use in harm to others than for harm to the drinker. For other social problems, the estimation of alcohol's causal contribution has no easy solution. For many social problems, there may be record-keeping attribution by a police officer, a social worker, or other professional. Other possible sources of attribution, often used in population surveys, are the drinker's own attribution of causality to alcohol, and those of the drinker's family members, friends, bystanders, or victims. There is often considerable variation in attribution among observers of the same

phenomenon, and this methodology has been criticized because survey respondents' attributions may not be sufficient evidence for causality (Gmel *et al.* 2000; Rossow and Ramstedt 2016). However, such attributions may, at times, constitute the essence of the social problem and thus become part of the data—if someone considers that his or her spouse's drinking is problematic, then that, in itself, indicates that there is a relationship problem connected to the drinking.

4.2.3 The role of average volume and drinking patterns

So far, we have only discussed relationships between alcohol use and its resulting social and health problems in general terms. Clearly, different dimensions of alcohol consumption must be distinguished in order to arrive at a better understanding of such relationships. In this chapter, as in the previous one, we mainly distinguish between two dimensions: average alcohol consumption and **drinking patterns**. Drinking patterns include infrequent heavy drinking occasions. For instance, one study showed that all-cause mortality in light to moderate male drinkers (0–2 drinks a day) was about twice as high if they had occasional heavy drinking episodes (Rehm *et al.* 2001; Roerecke and Rehm 2014). Heavy drinking episodes have been shown to contribute not only to mortality, but also to non-fatal consequences and to health outcomes, as well as social outcomes (Rehm *et al.* 2017a). Thus, any discussion of the relationship between alcohol consumption and its consequences needs to take into account both the nature of the problem (health vs social) and the dimension of drinking involved (average volume and/or pattern of drinking).

Up to this point, we have discussed alcohol use generally, as if all forms of alcohol have the same effect, independent of beverage type and independent of whether it is recorded or unrecorded alcohol (see Chapter 3 for definitions). In principle, this is usually the case, but there are some exceptions. First, given the same pattern and level of alcohol exposure, there is some evidence for an excess risk of injuries and alcohol poisoning related to the consumption of spirits, due to the associated rapid ethanol intake and intoxication (Rehm and Hasan 2020). Second, for different categories of unrecorded alcoholic beverages, such as home-made or surrogate alcohol, most harm seems to be caused by ethanol, rather than by any contaminants or other ingredients, but single and mass methanol poisonings constitute exceptions (Lachenmeier *et al.* 2021). While consumption of unrecorded alcohol in general is often associated with disproportionate harm, this harm is mainly linked to **hazardous drinking** patterns which are often associated with its use by the socially marginalized and drinkers with alcohol use disorders.

4.2.4 Evidence on alcohol's role: individual- and population-level research

Alcohol consumption plays a role in death, disability, and social problems at both the individual and population levels. At the individual level, the main question of interest is alcohol's causal role in harm or benefit. From a public health perspective, an

equally important question at the population level is what happens if there is an increase or decrease in alcohol consumption or a change in the drinking pattern. The answers to these questions often point in the same direction (Keyes and Galea 2016). Complicating this issue is the fact that each level of analysis has its own difficulties with measurement and causal attribution. Establishing causality from changes at the population level is complicated because it is difficult to control for **confounding** factors (Morgenstern 2008).

To better understand these phenomena, epidemiologists have developed a variety of research methods that focus on clinical samples, as well as on population-level analyses. With many of the health and social problems related to drinking, the causal role of alcohol cannot be discerned from an individual case. The establishment of cause depends, in part, on the degree of statistical association in a large sample of cases. Thus, the focus of an aetiological study in medical epidemiology commonly involves summarizing and comparing the individual outcomes across a large sample of cases.

Nevertheless, in most such studies, the sample does not represent the experience of a whole population (Rehm *et al.* 2021). This experience is represented by another type of evidence—population-level analyses (e.g. data from a whole country)—particularly **time-series analyses** which look at the covariation from one point in time to another between an alcohol variable and a potential outcome variable. In recent years, the number of time-series analyses has grown considerably in the field of alcohol research (Rossow and Mäkelä 2021), not only in epidemiology, but also in policy analysis (Beard *et al.* 2019).

If the results from individual-level and population-level studies point in the same direction, our confidence in the findings is increased substantially. Such is the case, for instance, for studies on the relationship between drinking and homicide (Rossow and Bye 2013). However, if the results do not point in the same direction, judgements must be made about the relative weight of evidence from the different studies. Despite the complexity involved in establishing causal relationships between alcohol and social problems, and the difficulties encountered in estimating the strength of these relationships, the science of alcohol epidemiology has advanced to the point where alcohol's specific role in a variety of health and social problems is now much more clearly understood, as the remainder of this chapter will show.

4.3 Alcohol consumption and health consequences to the drinker

To estimate the burden of disease attributable to alcohol-related health consequences, it is necessary to take into account both its deleterious and beneficial effects. Deleterious effects stem from alcohol's contribution to many chronic and infectious disease conditions, as well as to accidents, injuries, and acute toxic effects. Box 4.1 describes the major conditions associated with alcohol-related morbidity and mortality (see Rehm *et al.* 2017a for a complete listing). On the other hand, some specific drinking patterns have been found to have beneficial effects on coronary heart disease and ischaemic stroke (Puddey *et al.* 1999; Rehm and Roerecke 2017). The relationship between alcohol consumption and diabetes is not clear, but there is suggestive

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Box 4.1 Major causes of death and disease where alcohol use has a causal impact[a]

Chronic disease

- Infectious diseases: tuberculosis, *HIV/AIDS*, OTHER SEXUALLY TRANSMITTED DISEASES, pneumonia
- Non-communicable diseases:
  - Cancer: mouth and oropharyngeal, oesophageal, liver, colorectal, female breast
  - Neuropsychiatric diseases: alcohol use disorders, DEPRESSION, primary epilepsy
  - Diabetes
  - Cardiovascular diseases: hypertensive diseases, **ischaemic heart disease**, *cardiomyopathy*, ATRIAL FIBRILLATION AND FLUTTER, **ischaemic stroke**, haemorrhagic stroke
  - Gastrointestinal diseases: liver cirrhosis, pancreatitis
  - Conditions arising during perinatal period: fetal alcohol syndrome/fetal alcohol spectrum disorders

Injury
- Unintentional injury: traffic, drowning, fall, poisoning, other unintentional injury
- Intentional injury: self-inflicted injury, homicide, other intentional injury

[a] For details, see Rehm *et al.* (2017a).

Bold: partly beneficial conditions (see text); ***bold italics***: new conditions for 2016 WHO estimates; CAPITALIZED: not estimated, based on World Health Organization (2018a) and Shield *et al.* (2020).

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evidence for a beneficial effect of light to moderate drinking, including plausible biological pathways (Neuenschwander *et al.* 2019). While these beneficial effects can be found at the individual level, at the population health level, their importance is minimal (Shield and Rehm 2019).

The following sections review the evidence for some of the most important diseases and conditions related to alcohol use: coronary heart disease (CHD), breast cancer, liver cirrhosis, human immunodeficiency virus (HIV)/acquired immune deficiency syndrome (AIDS), and suicide. See Rehm *et al.* (2017a) for an overview of all disease and injury conditions.

4.3.1 Coronary heart disease

CHD is by far the most prevalent category for cardiovascular deaths and **disability-adjusted life years** (DALYs) (World Health Organization 2020). In individual-level

studies which have been carried out mainly in **high-income countries** (HICs), the relationship between alcohol consumption and CHD indicates a cardioprotective effect of light to moderate drinking (Roerecke and Rehm 2012). This effect explains the lower all-cause mortality rate of light drinkers relative to that of abstainers in many cohort studies (Di Castelnuovo *et al.* 2006), although the studies severely overestimate the protective effect due to selection bias (Rehm 2019b). This cardioprotective effect has been found consistently in many studies, even after adjusting for potential confounders and after correcting for the **'sick quitter' effect** (Shaper 1990a, b). While the evidence on the cardioprotective effect has recently been contested based on the selection of the comparison group (Zhao *et al.* 2017), our conclusion is that the effect has been overestimated in poorly designed studies but still persists at a lower level in well-designed studies. This effect applies mainly to the age group of those 60 years and older. The evidence for biological mechanisms is strong, but not conclusive (Zakhari 1997; Puddey *et al.* 1999; Rehm and Roerecke 2017). At least half of the effects seem to be short term (mainly related to the prevention of blood clots), so there may be little benefit from sporadic drinking, the most common drinking pattern in **low- and middle-income countries** (LMICs). For chronic and episodic heavy drinking patterns, overall detrimental effects have been found (Roerecke and Rehm 2014).

At the population level, there is no beneficial effect of an increase in consumption (Rossow and Mäkelä 2021). For instance, in countries such as Russia, with decreasing, but still high, levels of **heavy episodic drinking** (HED), the overall detrimental effects are marked. During time periods when consumption dropped, heart disease mortality rates also dropped (Leon *et al.* 1997; Neufeld and Rehm 2013), and in times when it increased, mortality rates increased (Shield *et al.* 2016a; World Health Organization 2019a).

We conclude that there is good evidence for the cardioprotective effect of regular light and moderate alcohol consumption at the level of the individual drinker, while heavy drinking has been associated consistently with detrimental effects on cardiovascular disease. Overall, the population health and policy implications of this conclusion are limited. There is little protective effect—and possibly even a detrimental effect—in societies with heavy drinking occasions, as evidenced by most aggregate-level studies (Rossow and Mäkelä 2021). When considering the public health implications of the individual-level cardioprotective findings, attention must be paid to strategies that increase the number of light regular drinkers while decreasing the number of heavy drinkers. For example, if a segment of the population could successfully be encouraged to reduce their drinking to one drink per day or every second day, they would obtain most of the cardiac benefits (Criqui 1994, 1996; Shield *et al.* 2017) without experiencing most of the alcohol-related problems. However, there is no evidence for effective strategies to accomplish this goal. On the contrary, increases and decreases in the level of consumption are generally spread proportionally across the whole population of drinkers in concert (Rossow *et al.* 2014; Room and Livingston 2017).

4.3.2 Breast cancer

Alcohol is a known carcinogen (Rehm *et al.* 2020) and has a small dose-dependent effect on female breast cancer (Bagnardi *et al.* 2015). There is a likely interaction with

hormones, especially oestrogen. With respect to drinking patterns, HED may be related to higher risks, but the evidence is only suggestive (White *et al.* 2017). Some studies show differences among alcoholic beverages in the relationship to breast cancer, but beverage preference is likely to be a marker for other factors (Rehm and Hasan 2020). We conclude that there is a dose–response relationship between volume of drinking and breast cancer—the more alcohol consumed on average, the higher the risk of breast cancer, with a significant increase in risk demonstrated for fewer than one drink per day; i.e., there is no safe limit (Hamajima *et al.* 2002; Shield *et al.* 2016b). As female breast cancer is the second most common cancer globally (and the most common among women (International Agency for Research on Cancer 2019)), the public health impact is huge and breast cancer is one of the disease conditions accounting for a large part of the alcohol-attributable harm in light to moderate drinkers (Rehm and Shield 2020; Rovira and Rehm 2020).

4.3.3 Liver cirrhosis

Liver cirrhosis and other liver diseases are a major cause of death globally (GBD 2017 Causes of Death Collaborators 2018), even though they have not been included in the World Health Organization (WHO) (2019b) targets for non-communicable disease. Liver disease is causally linked to alcohol use in a dose–response fashion (Roerecke *et al.* 2019). At the population level, an increase in total consumption leads to an increase in liver disease mortality. Globally, approximately half of all liver cirrhosis deaths and DALYs have been attributed to alcohol use in independent estimates over the past decade (Rehm *et al.* 2013b; World Health Organization 2018a). This relatively high attributable fraction means that liver disease deaths constitute the largest single contributor to alcohol-attributable deaths globally (World Health Organization 2018a). Alcohol-attributable liver deaths are highest in some regions where the level of alcohol consumption is relatively low such as in Central Asia and Western Sub-Saharan Africa. This apparent paradox can be explained by the fact that liver cirrhosis rates are high in this region, in part, due to hepatitis B and C viruses. Alcohol use, starting at relatively small doses, is a contributing causal factor to the worsening of liver disease (Rehm *et al.* 2010; Roerecke *et al.* 2019; Llamosas-Falcón *et al.* 2020). Such interaction effects are important for alcohol-attributable disease. For instance, in a study of French hospital stays between 2008 and 2013, 67.4% of 1599 liver transplants and 68.8% of 6677 liver deaths in young and middle-aged adults with chronic hepatitis C infection were attributable to alcohol use disorders (Schwarzinger *et al.* 2017).

4.3.4 HIV/AIDS

Alcohol use is strongly associated with incidence and progression of HIV/AIDS (e.g. Pithey and Parry 2009; Baliunas *et al.* 2010), and studies indicate a causal effect of alcohol use on the intention to engage in condomless sex (Rehm *et al.* 2012; Scott-Sheldon *et al.* 2016), including in HIV-positive people (Shuper *et al.* 2017), and thereby corroborate the causal chain to HIV incidence and reinfection (for an overview, see

Rehm *et al.* 2017c). Moreover, there are biological pathways between alcohol use and the course of HIV/AIDS (Rehm *et al.* 2017c). The same causal considerations would apply for other sexually transmissible diseases.

Condomless sex in the future may not have the same importance for the transmission of HIV as it once did due to new medications which lower the viral load in people with HIV and thereby render transmission impossible (UNAIDS 2019). However, alcohol use leading to forms of more risky sexual behaviour will persist.

4.3.5 Suicide

The relationship between alcohol and suicide is well established for heavy drinkers (Norström and Rossow 2016), both from individual- and aggregate-level studies. There is an acute impact due to disinhibition, impulsiveness, and impaired judgement, and alcohol may be used as a means to ease the distress that often results in a suicide attempt (Borges *et al.* 2017). Furthermore, there is a long-term effect of alcohol use disorders, which can cause high distress, a breakdown of social relations, and social marginalization (Wilcox *et al.* 2004). The strength of the relationship seems to vary across cultures. Individual- and aggregate-level studies both suggest that more 'explosive' drinking patterns (e.g. irregular heavy drinking occasions) are linked to a higher incidence of suicide (Norström and Rossow 2016).

4.3.6 Alcohol and all-cause mortality

Cohort studies of alcohol and all-cause mortality are not very informative, as they mainly describe drinking practices and causes of death for the middle class (Rehm 2019a, b). So-called deaths of despair (Case and Deaton 2020), where alcohol use is highly associated with liver cirrhosis, suicide, or alcohol poisoning, are underrepresented in cohort studies (Rehm and Probst 2018). As a result, the beneficial effects of alcohol use are overestimated (Rehm, 2019b). All-cause mortality for a country thus cannot be estimated by combining the results of cohort studies with all-cause mortality as the endpoint, but needs to be modelled based on the distribution of causes of death in a particular country and the respective associations between these causes of death and alcohol consumption (Shield and Rehm 2019; GBD 2019 Risk Factors Collaborators 2020).

4.3.7 Socio-demographic characteristics of alcohol-attributable harm to the drinker

Given that men consume a higher volume of alcohol and show more detrimental patterns of drinking (see Chapter 3), it is no surprise that most of the alcohol-attributable burden of disease and mortality occurs in men. Globally, the ratio is about 5- to 6-fold more alcohol-attributable all-cause mortality in men than in women, and the ratio is most pronounced for injury deaths (see Table 4.1).

Table 4.1 Alcohol-attributable deaths in 2019 by broad cause of death categories

	Women			Men			Total		
	PE	Lower	Upper	PE	Lower	Upper	PE	Lower	Upper
Communicable	39,525	23,995	56,146	252,902	181,619	321,057	292,427	206,988	374,510
NCD	304,915	232,832	388,037	1,544,956	1,303,696	1,792,311	1,849,872	1,576,529	2,133,113
Injuries	29,904	20,434	40,079	269,771	205,734	341,459	299,675	226,321	381,069
All causes	374,344	297,666	460,963	2,067,629	1,792,520	2,374,638	2,441,973	2,136,995	2,784,902

PE, point estimate; NCD, non-communicable diseases.

Source: data from Global Burden of Disease Collaborative Network (2020) Global Burden of Disease Study 2019 (GBD 2019) Results. Seattle, United States: Institute for Health Metrics and Evaluation (IHME).

While the absolute numbers of alcohol-attributable deaths increase with age, the proportion of deaths that are alcohol-attributable is highest in younger ages. In various comparative risk assessments, alcohol use was the most important risk factor for mortality in young adults until about 40–50 years of age (Shield and Rehm 2015; GBD 2019 Risk Factors Collaborators 2020).

4.3.8 Interactions with other risk factors

In discussing alcohol-attributable disease and mortality, we have already touched on the importance of statistical interactions. A substantial part of alcohol-attributable disease manifests itself in interactions. These could be with other risk factors, such as when alcohol acts as a solvent for cellular penetration of tobacco to cause oesophageal and other cancers (World Cancer Research Fund/American Institute for Cancer Research 2018).

The most important interaction may be with more distal factors, particularly with poverty and wealth, both within and across nations. As indicated in Figure 4.1, one
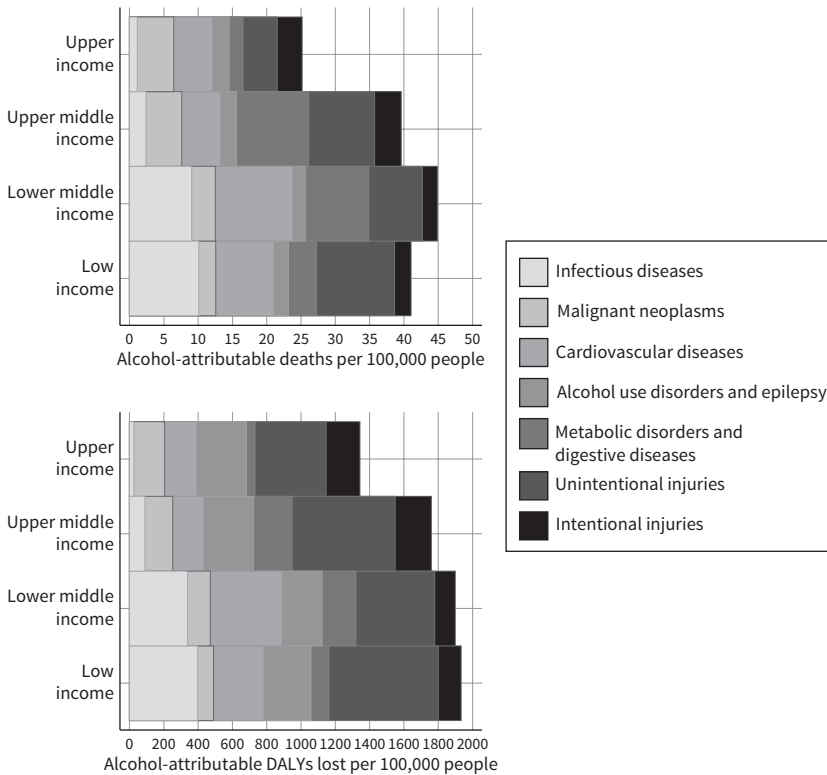
Figure 4.1 Rates per 100,000 people of alcohol-attributable deaths (upper panel) and DALYs lost, according to World Bank income groupings for 2016.

Box 4.2 Socio-economic status and the impact of alcohol

One litre of alcohol causes more health harm and mortality in people from lower socio-economic strata than in the wealthy. This seems to be independent of the overall wealth of a country. An example for a high-income country would be Scotland where people with lower socio-economic status experience 2- to 4-fold higher mortality (Katikireddi *et al.* 2017). Similarly, in the United States, despite comparable rates of drinking, higher rates of alcohol-attributable deaths of despair are found in people of lower education (Case and Deaton 2020) . Similar calculations for South Africa (Probst *et al.* 2018) show that people of low socio-economic status have an approximately 4.5-fold alcohol-attributable mortality rate, compared to persons of high socio-economic status, whereas for all-cause mortality, the rate for lower socio-economic status is 2.7-fold higher. Infectious disease mortality was responsible for most of the difference.

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litre of alcohol consumed *per capita* causes much higher rates of alcohol-attributable disease in LMICs than in HICs (World Health Organization 2018a).

And within countries (see Box 4.2), we have a matching phenomenon—the same level of drinking has been associated with a higher burden of disease and injury in lower socio-economic strata, compared to higher socio-economic strata (e.g. Probst *et al.* 2014, 2020) in both HICs (Bellis *et al.* 2016; Rehm and Probst 2018) and LMICs (Probst *et al.* 2018).

4.3.9 Summary of alcohol use and its health consequences to the drinker

The results summarized thus far point to the following conclusions:

- Volume of drinking is linked to most disease outcomes through specific dose–response relationships. These relationships can be almost linear (as in the case of breast cancer or suicide), accelerating (as in liver cirrhosis and motor vehicle accidents), or J-shaped (as in the case of CHD).
- Apart from the volume of drinking, the pattern of drinking also plays an important role in both the disease burden and the health benefits of drinking. Drinking patterns have been mainly linked to protection from CHD and to the occurrence of motor vehicle accidents and suicide.
- Light to moderate drinking has negative, as well as positive, health outcomes. Although there are CHD benefits for some individuals, light to moderate drinking has also been linked to an increased risk of cancer and other disease conditions. At the population level, there are no indications of protective effects of alcohol consumption.
- Men incur substantially more alcohol-attributable harm than women. Alcohol use is the most important risk factor for burden of disease and injury in early adulthood up to 40–50 years of age.

- Alcohol consumption interacts strongly with other risk factors to cause mortality and burden of disease. In addition to interactions with other behavioural risk factors, such as tobacco smoking and nutrition, alcohol strongly interacts with poverty and wealth.

4.4 Alcohol-attributable Global Burden of Disease

The preceding sections have described the relationship between alcohol consumption and some of the most important health conditions. However, alcohol also affects morbidity and mortality through many other diseases. Since the first Global Burden of Disease study in the 1990s (Murray and Lopez 1996; World Health Organization 1999), there have been updates on mortality and burden of disease caused by alcohol use, often as part of so-called **comparative risk assessments** (i.e. comparing the effects of all major risk factors for avoidable burden) (sciencedirect.com 2020), and in all of these studies, alcohol use was ranked among the ten most important risk factors (Rehm and Imtiaz 2016; GBD 2019 Risk Factors Collaborators 2020).

Table 4.1 gives an overview of alcohol-attributable deaths for 2019, as estimated by the Global Burden of Disease study (Global Burden of Disease Collaborative Network 2020; see also GBD 2019 Risk Factors Collaborators (2020)). Overall, more than 2.4 million deaths would not have occurred without the use of alcohol, of which 85% were in men. The overwhelming majority (76%) of these deaths were due to non-communicable diseases, and about 24% were due to communicable diseases and injuries. A recent WHO-associated study also found high mortality, with a total of about 3 million deaths (Shield *et al.* 2020), including much higher numbers of alcohol-attributable injury.

Both the WHO and Global Burden of Disease studies agree on alcohol use being one of the most important risk factors for global burden of mortality and disease, as measured in DALYs. Overall, more than one in every 25th death due to premature mortality or year of life lost due to disability would not have occurred without the use of alcohol. Not only do men experience considerably higher burden, but they also have considerably higher attributable fractions (mortality: women 1.4%; men 6.9%; DALYs: women 1.1%; men 5.9%—all figures based on GBD 2019 (GBD 2019 Risk Factors Collaborators 2020)).

In most countries, more than 90% of the whole alcohol-attributable burden is due to four broad disease categories: cancer (with a lag time of 10 years or more) (Grundy *et al.* 2016), cardiovascular disease, liver disease, and injuries (e.g. Shield *et al.* 2016a).

4.5 Alcohol consumption and social harm

Although public discussion has often concentrated on alcohol-related problems connected with disease and injury, alcohol use is also linked to consequences in the social realm, which have been called 'the forgotten dimension' (Klingemann and Gmel 2001). Box 4.3 lists the major areas included within this dimension. In contrast to most of the health-related impacts of alcohol use, many of the social harms are borne by

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Box 4.3 Categories of alcohol-related social harm

- Violence[a]
- Vandalism
- Public disorder
- Property damage
- Family problems: divorce/marital problems
- Child maltreatment
- Other interpersonal problems
- Financial problems
- Work-related problems other than work accidents[b]
- Educational difficulties
- Social costs

[a] Injuries from violence are partly included in accidents and injuries in Section 4.3 (for discussion and quantification, see Cherpitel *et al.* 2012).
[b] Work-related accidents are included in accidents and injuries in Section 4.3.

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someone other than the drinker. Social harm to the drinkers themselves and to others will be dealt with separately, although these harms are often interactively linked, as in the case of, for instance, alcohol-related violence.

4.5.1 Alcohol consumption and social harm to the drinker

Two main contexts where social harm has been linked to alcohol use are family life and the workplace. In both areas, the main effect seems to be on others, rather than on the drinker themselves; however, the drinker is also affected. In terms of family life, whether or not one partner's heavy drinking is a formal cause for divorce, as it has been at one time or another in many countries, heavy drinking is often involved in harming or disrupting family relationships, often against the wishes and interests of the drinker.

As for the workplace, there are clear associations between alcohol use, especially heavy use, and different outcomes, including lower earnings and unemployment (Rehm and Rossow 2001; Anderson 2012). However, the direction and nature of causality are often unclear. Most findings suggest rather complex interactions with both individual characteristics and environmental factors, including the type of work itself or workplace characteristics (Rehm and Rossow 2001).

A few studies at the aggregate level have, however, found that an increase in population drinking is associated with an increase in sickness absence (for review, see Rossow and Mäkelä 2021). In addition, a systematic review and **meta-analysis** showed that risky (20–40 g of alcohol/day) and high-risk (>40 g of alcohol/day) drinkers had an elevated risk of sickness absence, when compared to light to moderate drinkers, for both sexes. Those who abstained from alcohol had a higher risk of sickness absence than those who drank moderately (Marzan *et al.* 2022).

Finally, many surveys show financial losses to the drinker, especially for heavy drinkers. These may also affect other members of the drinker's family or household.

4.5.2 Alcohol consumption and harm to others

If adequately assessed, alcohol's harm to people other than the drinker—otherwise known as the 'second-hand effects' or 'collateral damage' of drinking (Connor and Casswell 2012)—would represent a large contribution to overall harm from alcohol use.

Key areas of health affected by alcohol's harm to others include death, injury, and disability due to violence, traffic crashes, prenatal exposure, and child maltreatment. Quantifying the health aspect of alcohol's harm to others is necessary to inform comparative risk assessments. Currently, these assessments, such as the Global Burden of Disease study or the Global Status Report (GBD 2019 Risk Factors Collaborators 2020), include alcohol-attributable fractions largely measuring harm caused only to the drinker, thus underestimating the total impact of alcohol use globally and for individual countries (Huckle *et al.* 2019). Valid indicators of harm to others appropriate for comparative assessments are urgently needed to inform decision-making and strengthen policy on alcohol control.

Drinkers can cause a range of social problems to those around them, including intimate partners, family members, children, friends, colleagues, and community members (Laslett *et al.* 2019). The scope of social problems also extends to economic and workplace harm, and diminished neighbourhood amenities and access to public space, as well as impact on well-being and quality of life. Quantifying the nature and size of these social problems is important, as they can impact on the quality of people's lives and negatively affect the social fabric of society (Lange *et al.* 2017; Laslett *et al.* 2019).

4.5.2.1 The health burden of alcohol use's harm to others

The total contribution to mortality of alcohol's harm to others is not currently known. However, in the European Union, in 2004, 3.3% of the total burden measured in deaths (3.1% for men; 3.8% for women) were attributable alcohol's harm to others from alcohol-impaired driving, violence, and fetal alcohol effects (Anderson *et al.* 2012).

Alcohol's harm to others plays a considerable role in some specific causes of death, including homicide, traffic crashes, and, to a lesser extent, fire deaths. The proportion of homicides related to the perpetrator's drinking ranges from 50% to 80%, although smaller proportions have also been reported (Rossow and Bye 2013). Around a third of family violence deaths are due to someone else's drinking (Connor and Casswell 2012). In Germany, 15% of all interpersonal violence deaths are due to another's alcohol use (Kraus *et al.* 2019). In 2016, 13% of all traffic deaths globally were attributable to another's drinking (Shield *et al.* 2020). For both deaths and DALYs, the alcohol-attributable fractions for traffic harms due to other people's drinking were markedly higher for women, compared to men. In New Zealand, 24% of those killed in alcohol-related fires were people other than the drinker responsible for the fire. Of these deaths, 45% were children (Connor and Casswell 2012).

Studies on hospitalizations attributable to another's alcohol consumption are relatively scarce. Available studies provide evidence of a large contribution of other's alcohol consumption to violence-related hospitalizations (Rehm *et al.* 2017a). For example, one study estimated that 45% of hospitalizations for assault in Australia are attributable to alcohol consumed by others (Laslett *et al.* 2010). In emergency departments across 14 countries, 15% of violent injury presentations where alcohol was reported as the cause were due to another's drinking (Cherpitel *et al.* 2012).

4.5.2.2 Child-specific health burden

Fetal alcohol syndrome (FAS) and **fetal alcohol spectrum disorders** (FASD) are the leading preventable birth defects, including intellectual and neurodevelopmental disabilities (Williams and Smith 2015). The worldwide prevalence of FASD among children and youth in the general population was estimated to be 7.7 per 1000 (Lange *et al.* 2017). There is substantial variation across the world, with South Africa reporting the highest prevalence (111 per 1000 population), followed by Croatia (53 per 1000 population) and Ireland (47 per 1000 population). Some populations—including adoptees, correctional populations, and some indigenous populations—have considerably higher rates of FASD than the general population (Lange *et al.* 2017). For FAS, the most severe presentation of FASD, 1 out of every 67 women who consumes alcohol during pregnancy will deliver a child with FAS—translating to more than 100,000 children born every year with FAS (Popova *et al.* 2017a). Table 4.2 describes the estimated prevalence of FASD and FAS among children and youth in six global regions of the world.

There are clear links between alcohol consumption and harm to the fetus during pregnancy. The causal link between HED during pregnancy and the risk of FAS is well established (Jones *et al.* 1973; Jacobson and Jacobson 1999; Sood *et al.* 2001; Kelly *et al.*

Table 4.2 Estimated prevalence of FASD and FAS among children and youth in the general population

	Prevalence of alcohol use during pregnancy	Prevalence estimate per 1000 population	
		FASD	FAS
African region	10.0%	7.8	1.5
Eastern Mediterranean region	0.2%	0.1	0.02
European region	25.2%	19.8	3.7
Region of the Americas	11.2%	8.8	1.7
South East Asia region	1.8%	1.4	0.27
Western Pacific region	8.6%	6.7	1.3
Globally	9.8%	7.7	1.5

Sources: data from Lange S, Probst C, Gmel G, *et al.* (2017) Global Prevalence of Fetal Alcohol Spectrum Disorder Among Children and Youth: A Systematic Review and Meta-analysis. *JAMA Pediatrics*, 171, 948–956; and Popova S, Lange S, Shield KD, *et al.* (2019) Prevalence of fetal alcohol spectrum disorder among special subpopulations: a systematic review and meta-analysis. *Addiction*, 114, 1150–1172.

2009; Alvik *et al.* 2011). HED also seems to underlie the impact of alcohol use for FASD where the type and severity of birth defects induced by prenatal alcohol exposure are largely dependent on the pattern of exposure and the quantity of alcohol consumed (along with the developmental stage of the embryo at the time of exposure) (Lange *et al.* 2017). Populations with a high prevalence of HED have a high prevalence of FASD (Sood *et al.* 2001; May *et al.* 2005; Viljoen *et al.* 2005; Urban *et al.* 2008; Popova *et al.* 2017b).

Consumption at levels considered lower than 'heavy drinking' during pregnancy can also have adverse effects on neurodevelopment when the mother consumes 42–56 g of absolute alcohol per week (Sood *et al.* 2001; Rehm *et al.* 2017a). Studies have, however, reported no increased risk of behavioural and developmental deficits in children for lower amounts of alcohol use (8–28 g per occasion) (Sood *et al.* 2001; Linnet *et al.* 2003; Testa *et al.* 2003; Gray and Henderson 2006; Kelly *et al.* 2009).

According to one meta-analysis, heavy alcohol consumption leads to increased risks of low birthweight, preterm birth, and being small for gestational age (Patra *et al.* 2011). Another meta-analysis found evidence that alcohol consumption during pregnancy is associated with a dose-mediated increase in miscarriage risk (Sundermann *et al.* 2019).

Child maltreatment and neglect due to someone else's drinking also put children at risk (Gilbert *et al.* 2009). When drinking, carers may lose vigilance or initiate conflict or violence. The strongest evidence is based on meta-analyses and on objective documentation of alcohol involvement in maltreatment. In one meta-analysis, measures of more severe drinking problems were related to physical child maltreatment (Stith *et al.* 2009). When parents are identified as having severe alcohol problems during a hospital admission, children have a 30% higher odds of experiencing violence, compared to children of parents who are not identified (Christoffersen and Soothill 2003).

Approximately 25% of fatal child maltreatment cases in England were associated with parental alcohol misuse (Sidebotham *et al.* 2011). This percentage is very similar to that for maltreatment deaths and hospitalizations in Australia (Laslett *et al.* 2010) and deaths in New Zealand. However, the New Zealand percentages (Child and Youth Mortality Review Committee 2011) also include persons other than the parents. For child injury deaths, which can indicate neglect and lack of supervision (Raitasalo *et al.* 2015), a 10% decrease in per capita consumption was associated with a 3.3% reduction in child injury deaths in Australia (Laslett *et al.* 2018).

4.5.2.3 Social harm related to other people's drinking
4.5.2.3.1 *Violence*
Alcohol use is an important causal factor in interpersonal violence and increases the likelihood of aggressive behaviour (Giancola 2013). Despite solid evidence that alcohol use is involved in a large fraction of violent incidents (Rossow and Bye 2013), in many cases, there is no clear distinction between perpetrator and victim, and often both parties had been drinking (Pernanen *et al.* 2002). This complicates the assessment of violent injuries attributable to someone else's drinking. The estimated proportion of homicides or non-fatal violent injuries related to the perpetrator's drinking differs substantially across studies; some are in the magnitude of 15% (Kraus *et al.*

2019), and others higher (Connor and Casswell 2012), and even exceeding half of all violent incidents (Rossow and Bye 2013).

Just as the acute effects of alcohol on the drinker usually arise from intoxication, alcohol's harms to others—particularly violence—can result from the same underlying mechanism (Connor *et al.* 2015). Frequent intoxication is associated with a higher risk of violent behaviour (Rossow and Bye 2013), and level of intoxication, rather than alcohol involvement per se, predicts aggression severity (Wells and Graham 2003). Both individual- and aggregate-level studies suggest that 'explosive' drinking patterns (e.g. irregular, heavy drinking occasions) are linked to a higher incidence of homicide (Rossow and Bye 2013).

Aggregate-level studies suggest that the average volume of consumption at the population level is related to violence. For instance, a 1-litre increase in annual **alcohol per capita consumption** (APC) was associated with an 8% increase in the Australian homicide rate (Ramstedt 2011), and an increase of 9% in the United States (Norström 2011). Similar findings are reported from European countries, with stronger effects in Nordic countries where the traditional drinking culture includes more irregular heavy drinking occasions (Ramstedt 2002; Norström and Ramstedt 2005). In the former Soviet Union, known for its HED pattern (Zaridze *et al.* 2014), male homicide deaths decreased by 40% when APC dropped by 25% (Shkolnikov and Nemtsov 1997).

4.5.2.3.2 Harm to others in the family

Women and children bear much of the burden of harm due to others' drinking in the family. Harms to women come largely from male intimate partners and family members, whereas harms to men more often come from male friends, distant relatives, and acquaintances (Laslett *et al.* 2011; Huhtanen and Tigerstedt 2012; Stanesby *et al.* 2018). Men are also more likely than women to report that their drinking causes harm to others (Wilsnack *et al.* 2018).

Alcohol consumption increases the likelihood of intimate partner violence, and more so for perpetration by males. A meta-analysis showed that binge or heavy drinking was associated with intimate partner violence perpetration more than the frequency of drinking (Foran and O'Leary 2008). HED can double the risk of perpetration of intimate partner aggression (Connor *et al.* 2011). In countries with substantial alcohol consumption, almost half of intimate partner violence incidents involve intoxicated perpetrators (Fonseca *et al.* 2009), and HED predicts intimate partner violence perpetration, for which the underlying mechanism is likely intoxication (Connor *et al.* 2011). Meta-analyses have also found that measures of more severe drinking problems (e.g. **alcohol use disorder**) predict intimate partner violence perpetration (Stith *et al.* 2004) and have larger **effect sizes** relative to other consumption measures (Foran and O'Leary 2008). There is a small effect size for the association between alcohol abuse and female-to-male partner violence (Stith *et al.* 2004; Foran and O'Leary 2008). When both partners are drinking, rates of victimization and perpetration may be similar for males and females (Connor *et al.* 2011). In intimate relationships, females also are more often victims of sexual violence than men (Smith 2018). Ten per cent of Australians with partners reported being forced or pressured into sexual activities due to their partner's drinking (Laslett *et al.* 2015).

4.5.2.3.3 Sexual assault

The contribution of alcohol use to sexual assault is considerable. While estimates of sexual violence are almost always underestimated because most go unreported, around 50% of reported sexual assaults are committed by men who have been drinking alcohol (Connor *et al.* 2009). Even though men experience sexual violence related to other people's drinking, studies of this association are exceedingly rare. Fewer than 5% of men report being forced or pressured into sex due to a problematic family member's drinking (Laslett *et al.* 2015).

4.5.2.4 Other harm burden

4.5.2.4.1 Subjective quality of life and health

Ratings of subjective quality of life and health status are lower among those with a heavy drinker in their life (Livingston *et al.* 2010; Greenfield *et al.* 2016; Laslett *et al.* 2019). The perceived well-being of those exposed to heavy drinkers is similar to that of those who care for people with disability (Casswell *et al.* 2011b).

4.5.2.4.2 Diminished access to neighbourhood amenities and public space

Surveys in both LMICs and HICs show that negative impacts on the general public's use of local amenities and public space are the most common harms experienced from other people's drinking (Laslett *et al.* 2011; Waleewong *et al.* 2018). Between 32% and 43% of people go out of their way to avoid intoxicated people or the places where they drink (Casswell *et al.* 2011a; Laslett *et al.* 2011). Public space amenity harms are greater among women and younger people (Laslett *et al.* 2011), and in socially deprived communities.

4.5.3 Social cost of alcohol

Studies of the social cost of alcohol attempt to estimate the full economic costs of alcohol use from a societal perspective. They comprise both direct and indirect costs where the latter subsumes productivity losses (e.g. by alcohol-caused absenteeism, disability, or premature mortality) (Single *et al.* 2003). Direct cost categories usually comprise health care and legal costs (e.g. policing, court, and prison costs). Direct costs are defined as any costs incurred by a society which would not have happened in the absence of alcohol; thus, in some studies, prevention efforts, alcohol research, or alcohol-attributable traffic costs have been included. Overall, the costs of alcohol are substantial, with one review (Rehm *et al.* 2009) indicating a toll of between 0.7% and 2.4% of the gross domestic product (GDP), as measured by purchasing power parity (PPP).

A review of 29 cost studies conducted since 2010 (Manthey *et al.* 2021) found that the majority showed costs of between 1% and 2% of the GDP. However, in a scenario where all costs to the drinker would be estimated, the proportion of GDP increases to 2.6%. About one-third of costs (38.8%) were incurred through direct costs, whereas the majority of costs were due to losses in productivity (61.2%). Box 4.4 describes how alcohol's harm to others may further increase economic costs.

Box 4.4 The cost of alcohol's harm to others is considerable

The cost of alcohol use to society has usually been estimated for the drinker, while excluding the costs resulting from others' drinking. As new research on alcohol's harm to others has become available, so too have new cost estimates. An Australian study has provided a first approximation to estimating the full social cost of harm from others' drinking. In 2016, the harm related to others' alcohol consumption cost $19.8 billion, with tangible costs accounting for 58% of total costs, which is 0.68% of the GDP, and cost roughly the same as the cost of harm to drinkers themselves. Thus, the social costs from others' drinking are of the same order of magnitude as the costs that drinkers impose on themselves.

Source: Jiang H, Doran CM, Room R, Chikritzhs T, Ferris J, Laslett AM, (2022) Beyond the drinker: Alcohol's hidden costs in 2016 in Australia. *Journal of Studies on Alcohol and Drugs*.

In summary, alcohol's harm to others is a new research paradigm still in its infancy. If cost estimates are taken into account, in some countries, harm to others can be as important as harm to the drinker. Although alcohol's harm to others is certainly very important, it cannot yet be quantified as clearly as can harm to the drinker. Just as research on the role of passive smoking contributed to the development of more effective public policy governing the use of tobacco, alcohol's harm to others may have considerable policy significance (Laslett *et al.* 2019).

4.6 Conclusion

Alcohol use is a risk factor for a wide range of health conditions and social problems. The effects of alcohol use on the drinker account for approximately 3 million deaths worldwide and 5% of the global burden of disease (Shield *et al.* 2020), placing it alongside tobacco use as one of the leading preventable causes of death and disability. In addition to health harm and social consequences to the drinkers themselves, alcohol use causes significant health and social harm to persons other than the drinker and these effects are not yet represented adequately in the statistics.

Alcohol-attributable harm is not distributed equally across social strata or countries of different wealth. For any individual, the lower his/her stratum and the poorer the country in which he/she lives, the higher the harm experienced per litre of alcohol consumed, suggesting that effective alcohol policy can be an important contributor to more equitable health outcomes.

The level of alcohol consumption matters for the health and social well-being of individuals and for the population as a whole. In addition to this, the predominant pattern of drinking in a population can have a major influence on the extent and nature of harm from alcohol consumption. Patterns that seem to add most to the harm are drinking to intoxication, whether intermittently or frequently, sometimes linked with consumption of beverages with high alcohol content (Rehm and Hasan 2020). In sum, the overall conclusion for alcohol policy is that alcohol contributes to both social and health burdens, and good public policy will be needed to reduce both of these burdens.

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5

The alcohol industry: a nexus of considerable influence

5.1 Introduction

The alcohol industry comprises a nexus of actors who control the essential commercial processes of production, marketing, and supply. Their practices determine, in large part, trends in consumption and harm, and collectively they exercise considerable influence in the policy arena, In this chapter, we consider the structure and roles of four of these actors: the companies producing alcohol, particularly the large **transnational alcohol corporations**[1] (TNACs); their surrogates, especially the social aspects, organizations, and trade organizations; the marketers, including the digital platforms and global sporting and cultural event organizers; and the distribution sector. These players, large and small, have diverging interests, as well as interests in common regarding policy frameworks. The role of the alcohol industry and its surrogates in the policymaking process (Holden *et al.* 2012) will be taken up in Chapters 14 and 15.

The structure and practices of the alcohol industry, as with other industries producing and marketing commercial determinants of health (Kickbusch *et al.* 2016), are pivotal to the challenges faced by those promoting alcohol control policy. At the heart of the conflict between the alcohol industry and the public health community is the industry's reliance for growth on expanding markets, thereby resulting in higher volumes of alcohol consumed, and their reliance on heavy consumption for sales and profits in existing markets. Box 5.1 explains the industry's conflict of interest in relation to its reliance on sales to heavy drinkers.

5.2 The production sector

In Eastern Europe, the Nordic countries, and, more recently, in Asia, there has been a marked shift away from state ownership of alcohol production in favour of private companies. In Vietnam (Casswell 2022) substantial increases in consumption of recorded alcohol since 1980 have been accompanied by a shift to private ownership. Such privately owned companies are answerable to shareholders, with a very different set of interests from those of public health decision-makers. The size and profitability of these companies arise from, and drive, global expansion to ensure future growth.

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

Box 5.1 The alcohol industry's conflict of interest

The World Health Organization defines heavy episodic drinking using a cut-off of 6+ drinks for men and 4+ for women. The alcohol industry relies on heavier use of alcohol for much of its profits. In higher-income countries, heavier drinking occasions make up approximately 65% of sales, and in middle-income countries, it is closer to 75% (Casswell *et al.* 2016). It is this reliance on the heavier use of alcohol which underpins the conflict between the interests of the transnational alcohol corporations and those of public health. Partnerships or collaborations between government and policymakers and the alcohol industry are unlikely to lead to effective policies when heavier drinking provides a large share of industry sales and profit. These conflicts of interest militate against alcohol industry involvement in the alcohol policy arena and should serve to ensure their efforts to influence policy are interpreted in this light.

Industry consolidation nationally and internationally has greatly increased capacity to promote alcohol brands and normalization of drinking in many contexts and settings.

5.2.1 Global consolidation of alcohol production

The global alcohol market is dominated by a handful of large corporations, most of which are transnational in character and highly profitable. AB InBev, the largest alcohol corporation in 2021, had an annual revenue of US$45.6 billion in 2017, which puts it ahead of half of the world's countries in terms of their gross domestic product (GDP) (Casswell 2019). As of January 2019, profitability, based on net income, of the alcoholic beverage industry was higher than non-alcoholic beverages and food processing (but less profitable than tobacco) (Damodaran 2019). This consolidation and profitability have implications for public health because the resulting economies of scale and profit growth provide these companies with unprecedented resources for buying into new markets, promoting alcohol brands, controlling distribution, and influencing policy.

Most of the global companies trace their origins back to the nineteenth and early twentieth centuries as small local breweries or distilleries. These companies grew through mergers or acquisitions in the 1960s and 1970s, began to operate internationally and consolidate regionally in the 1980s, went global in the 1990s, and continued consolidation until the last decade. Local acquisitions provided the TNACs with production facilities, distribution networks, and cultural knowledge for marketing purposes. An even faster route to new markets was to buy a global competitor in order to obtain its profitable brands and its share of established and new markets, as Pernod Ricard, Heineken, Carlsberg, and Inbev all did in 2008.

The megadeal that created AB InBev in 2016 provided increased access to new markets in **low-and middle-income countries (LMICs)** (see Box 5.2), Despite some increase in local artisanal production, e.g. craft beer, TNACs and large Chinese producers now dominate global alcohol production, as indicated by the sales and profit data presented in Table 5.1.

Box 5.2 How the biggest alcohol corporation came into being

In 2004, InBev was created through a merger of AmBev and Interbrew, an amalgam of Latin American, Canadian, and European brewery interests. In 2008, Anheuser-Busch was acquired, and acquisitions of Grupo Modela in 2012 and South Korea Oriental Brewing in 2014 helped international penetration. In 2016, a merger was negotiated with African rival SABMiller to create AB InBev. The AB InBev merger was the third largest in corporate history, establishing a dominant market position at an estimated one-third of all beer sold worldwide (Collin *et al.* 2015).

The size of the AB InBev corporation was made possible because of access to very cheap capital and the business tactics of the Brazilian finance company 3G Capital, which had been involved with the precursors of AB InBev for decades (Dowd 2019; Wehring 2020b). The business case for this merger was based on exploiting complementary geographical strengths of the two companies in key regions with emerging economies and strong growth prospects, including Africa, Asia, and Central and South America. Sub-Saharan Africa, in particular, was considered a critical driver of growth for the combined company (Collin *et al.* 2015). This reflects SAB Miller's South African heritage and regional strengths (Collin *et al.* 2015).

Table 5.1 The world's ten largest alcohol corporations

Name of company (country of registration)	Sales (US$)	Profits (US$)
1 Anheuser-Busch InBev (Belgium)	52.3 billion	9.1 billion
2 Diageo (United Kingdom)	16.8 billion	3.9 billion
3 Heineken (The Netherlands)	26.8 billion	1.2 billion
4 Kweichow Moutai (China)	11.3 billion	6.2 billion
5 Pernod Ricard (France)	10.6 billion	1.6 billion
6 Asahi Group Holdings (Japan)	19.2 billion	1.3 billion
7 Kirin Holdings (Japan)	17.8 billion	547.1 million
8 Carlsberg (Denmark)	9.9 billion	984.8 million
9 Wuliangye Yibin (China)	5.2 billion	2 billion
10 Constellation Brands (United States)	8.3 billion	−11.8 million

Source: Publicly trading companies ranked by composite score of sales, profits, (Forbes Global 2000, as of May 2020) (Murphy A, Tucker H, Coyne M, *et al.* (2020, May 13) GLOBAL 2000: The World's Largest Public Companies https://www.forbes.com/global2000/#491698da335d)

5.2.2 Beer industry

Globally, beer dominates the recorded alcohol market, placing the world's leading brewers at the forefront of the industry and reflecting the size of mergers and acquisitions in this sector.

Box 5.3 Development of a TNAC from a middle-income country

ThaiBev expanded operations during a 5-year-long partnership with Carlsberg and is now one of South East Asia's largest beverage companies. ThaiBev was listed on the Singapore stock exchange in 2006, following an attempt to list in Thailand which was successfully opposed by Buddhist monks and other health-oriented civil society groups. ThaiBev now also has significant operations in Europe, producing Scotch whiskey, vodka, gin, and liqueurs at five distilleries in Scotland in the United Kingdom, and owns a majority share in Sabeco, a Vietnamese brewery. The logo of Chang beer, a flagship brand of ThaiBev, is seen throughout Thailand, ostensibly advertising Chang mineral water, in an example of **brand-stretching** to avoid Thailand's restrictions on alcohol marketing. ThaiBev, like other TNACs, is also engaged in cross-border marketing using **digital platforms** and branding of sports events (Inside World Football 2018).

One aspect of the producers' consolidation is that it creates greater control over distribution, forcing other brands into less prominent positions on store shelves or out of these locations altogether. In the case of AB InBev, this allowed for increased prices which led to increased profit margins (Hoium 2018). However, a shift by consumers to craft beer has contributed to stagnation in the volumes of 'big beer' consumed in recent years. AB InBev spent more on sales and marketing in 2017 than it did 10 years ago, just to maintain its volume.

Most TNACs developed from corporations that were headquartered in **high-income Countries** (HICs), but the past two decades have seen the emergence of TNACs headquartered in middle-income countries. Box 5.3 describes the development of a TNAC from a middle-income country.

5.2.3 Spirits industry

Spirits, a category which includes a variety of distilled alcoholic beverages (including blended or mixed beverages), is the second most important segment by value in the global market. As volume demand has been mostly flat or falling in mature markets (Statista 2020a), in recent years, upward trends in value have been mostly driven by **premiumization**, a strategy that encourages consumers to move towards beverages with higher prices.

Consolidation of producers has occurred in the spirits sector, as in the beer sector. By 2006, production of Western spirits was dominated by just two TNACs, namely Diageo and Pernod Ricard, with the latter also owning a considerable part of the world's wine production. Diageo remains a major player in distilled spirits. Its share of the global market is double that of its nearest TNAC competitor Pernod Ricard (Jernigan and Ross 2020). By 2019, half of Pernod Ricard's sales were in the Americas and Asia. It remains a dominant influence in Asia and, in 2020, was building a new distillery in China. The aim is to produce a new product for China, a type of malt

Table 5.2 Most valuable spirits brands[a] in 2019

Brand	Brand value in 2019 (in US$, billion)
1 Moutai	30.47
2 Wuliangye	16.04
3 Yanghe	9.06
4 Luzhou Laojiao	5.37
5 Johnnie Walker	4.64
6 Jack Daniel's	4.33
7 Hennessy	3.87
8 Bacardi	3.66
9 Smirnoff	3.5
10 Gujing Gong Jiu	2.7

[a] Brand value reflects both marketing and financial information to provide estimates of the value of the intangible asset—the brand.

Source: data from Brand Finance (2019) Spirits 50 2019. https://brandirectory.com/download-report/brand-finance-spirits-50-2019-preview.pdf

whiskey, to encourage consumption outside of meals where **baijiu**—the national spirits drink—is usually consumed (Morton 2019).

National Chinese spirits brands are of greater value than the TNACs' brands, reflecting China's large population. The four most valuable spirits brands are Chinese, dwarfing well-known global brands such as Johnnie Walker. Table 5.2 shows the ten most valuable spirits brands globally in 2019. The consumption of 'national spirits', such as baijiu (China), **soju** (Korea), and **shochu** (Japan), was expected to grow slowly (i.e. by 2.1%) between 2016 and 2021 but would nevertheless constitute almost half of global spirits (The Spirits Business 2018).

Just as Western spirits beverages emerged from national origins to become global beverages (e.g. Scotch whiskey), some large Asian spirits producers are looking to become global, such as soju producer HiteJinro, which has aspirations to join Diageo and Pernod Ricard as global spirits companies. The large baijiu producers are adapting beverages to meet Western tastes, partnering with distributors and using global marketing opportunities (see Box 5.4).

5.2.4 Wine sector

There has been some consolidation in the wine sector, though it has been much less than in beer and spirits. Wineries have merged, and beer and spirits companies have acquired wineries because their own markets were stabilizing and entry into the wine business was seen as a mechanism for re-energizing revenue growth. For example, large Japanese beverage companies, including Kirin Holdings, Suntory, and Sapporo,

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Box 5.4 Baijiu producers going global

Luzhou Laojiao, China's fourth largest baijiu producer, has promoted its cocktail products via sponsorship at the Soccer World Cup and, in 2018, established Ming River, a New York-based joint venture. Aiming to put the Chinese white spirit on the global cocktail map, Ming River has partnered with Sazerac's Hi-Spirits unit in the United Kingdom and the Southern Comfort and Buffalo Trace distributor in the United States. Luzhou Laojiao baijiu is also on sale through local distributors in Germany, France, Japan, and Indonesia (Morton 2020d). In 2019, Pernod Ricard agreed to distribute Wuliangye baijiu (the number two brand to Moutai) in other countries of South East Asia, as part of the baijiu producers' attempts to build an increasingly global presence (Woodward 2020).

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all own wineries in Japan and have increasingly shifted their focus to the international market. Suntory operates several wineries in France and Germany.

There are substantial differences in the structure of the wine industry around the world. In 2011, there were 232,900 wine producers in France, and the top ten brands controlled only 4% of the market. In contrast, four firms controlled over 75% of the Australian wine market. Overall, there is a marked difference in industry structure between 'New World' producers (e.g. Australia, New Zealand, Chile, United States) and 'Old World' firms (European producers), partly for historical reasons, but also reflecting competitive strategies. European wine production was traditionally a family affair and there are still more private companies in Europe, while most of the largest winemakers in the United States and Australia have become publicly traded corporations (Roberto 2011).

Consolidation by wine producers and distributors may have been a response to the market power of retailers and distributors, with the goal of gaining valuable shelf space and achieving favourable contracting terms (Roberto 2011). Emphasis on branding and advertising creates the potential for increasing scale and scope. Larger firms have greater influence with advertisers and can leverage a brand image by creating a prestigious high-end wine and then extending the brand to offer a full range of wines at various price points (Roberto 2011). Private equity investors are also entering the wine industry—in 2018, the Catalan Cava house Raventós Codorníu, the oldest winegrowing business in Spain, announced the sale of a large stake to the global Carlyle Group, a private equity company (Pellechia 2018).

The move to online sales is supporting growth in the wine sector, as selling and delivering wine direct to the consumer is an effective strategy. Large companies are beginning to take positions in established online operators, also acknowledging the value of the data that can be obtained online (Rannekleiv and Castroviejo 2018). Recognizing the popularity of e-commerce in China, E & J Gallo Winery, the largest wine producer in the United States (Thornton 2013) has started a flagship store on Tmall, a retail platform owned by Alibaba, the world's largest online and mobile commerce company (E&J Gallo Winery 2018). Other international wineries have similarly entered the Chinese market via the large Chinese e-commerce platforms Tmall, Taobao, and JD. More recently, the wine industry has been using WeChat to promote

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Box 5.5 Growth of the wine market in China

With its vast population, despite relatively low per capita wine consumption, China is now Asia's top wine consumer, accounting for around 7% of the world total. The country has the second largest vineyard surface area among vine-growing countries in the world, although wine production has decreased since 2015, in part due to competition from imported wines which now comprise 40% of the Chinese wine market.

Hong Kong has served as a major wine trading and distribution hub for mainland China and the Asia-Pacific region, following the elimination of all duties on wine in 2008. Free trade agreements with New Zealand, Chile, and Georgia meant that wine could be imported to China under zero tariffs, while recent trade wars with the United States have led to total tariffs of up to 40% on wines from the United States.

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and sell Australian wines (Young 2019). While imported wine remains a small part of the Chinese alcohol market, it is expanding in the context of trade and investment agreements which allow relatively free access. Box 5.5 describes how this is happening.

5.3 Industry strategies in response to stabilization of consumption in high-income countries

The TNACs are responding to stabilization of consumption in HICs, which they describe as reflecting increased health consciousness, with development of new low-alcohol and non-alcoholic beverages and a focus on issues such as sugar and calorie content. International brewers have launched hard seltzers under newly created brands. In the United States, AB InBev's Bud Light Seltzer was joined by Constellation Brands' Corona Seltzer and Molson Coors Beverage Co's Coors Seltzer. Coca Cola entered the 'hard seltzer' market in 2021 in partnership with Molson Coors (which also introduced a cannabis-based non-alcohol beverage) (Hancock 2020).

The market for hard seltzers is expected to experience substantial growth, owing to the growing popularity of low-content alcoholic beverages among the millennials in the developed economies, including the United States, Canada, and Australia, assisted by strong marketing. While marketed as a low-alcohol beverage, most hard seltzers are comparable with beer at 4.5–7% alcohol by volume (ABV) but are typically 100 calories per can or less (Eads 2020). Other types of alcoholic beverages marketed as 'better for you' include no- and low-sugar, low-calorie, low-carbohydrate, and gluten-free products (IWSR Drinks Market Analysis 2020a).

Non-alcoholic beverages are now produced by most TNACs. For example, Diageo owns non-alcoholic brands, including Seedlip and Pure Brew, a non-alcoholic Guinness. The company also produces two non-alcoholic beers under the Guinness brand—Malta Guinness in Africa and Guinness Zero in Indonesia.

This trend to low- and no-alcohol beverages is presented in annual reports to shareholders as consistent with the TNACs' **corporate social responsibility** (CSR) strategy

to promote responsible drinking or a 'positive drinking culture'. However, these beverages may add to, rather than replace, full-strength brands. Hard seltzers are marketed as suitable for all drinkers and for consumption throughout the day; the marketing campaign for High Noon Sun Sips, for example, was centred around the day-drinking occasion and brand aficionados as 'nooners', implying drinking at midday (IWSR Drinks Market Analysis 2020b). Heineken 0.0 was said to bring new volumes and new occasions, even replacing the 'lunchtime glass of milk' for some (Morton 2020a). The promotion of no alcohol brands with the same logo and packaging also allows for brand stretching where advertising alcohol brands is restricted.

In the stabilizing HIC markets, there is also a strong focus on premiumization. As designs and recipes for different brands of a beverage are broadly similar, what makes a product 'premium' is largely a marketing strategy targeting the high end of the market. The brand image is tailored to attract a demographic group or market niche.

5.3.1 Targeting volume growth in LMIC markets

In the first years of the twenty-first century, the TNACs were reporting to shareholders the strategic importance of expansion into new markets and working to support trade and investment treaties (see the second edition of this book). While the expansion into new markets in LMICs and support of trade and investment agreements are no longer presented as an innovative strategy by the TNACs in their annual reports, this remains a key part of their commercial platform.

The industry strategy of expansion into new markets was enabled by high operating profits (7–12% a year in the early 2000s), which meant companies had money to spend on entering new markets through distribution partners, joint ventures where required, buying shares in existing companies, building new plants, or, quite typically, simply buying the local competitor.

Growth occurred through sales in new markets with developing or recovering economies, growing middle classes, and population growth among young adults. In the first decade of the twenty-first century, there was a focus on new markets in the deregulating countries of Eastern Europe and the growing economies of Latin America and Asia. China, in particular, was recognized to have great sales potential for beer producers. Spirits producers also targeted the fast-growing BRIC economies—Brazil, Russia, India, and China. In 2005. Diageo reported spirits volume increased by 21%, 51%, 26%, and 78%, respectively, in these countries, compared to 3% globally. Once established in these BRIC countries, the global corporations reported using their base to extend production, marketing, distribution, and sales to neighbouring cities, states, or countries in the region.

The stabilization in consumption in countries across Western Europe, North America, Australasia, and Eastern Europe has led to a continued focus on key alcohol markets for expansion and investment in Latin America, Asia-Pacific, and now the Middle East, and—increasingly—Africa (Collin *et al.* 2014; Jernigan and Babor 2015; Robaina *et al.* 2020). Within the spirits sector, the Asia-Pacific region has been key to market expansion, with the massive Chinese and Indian markets as principal drivers of growth. In 2016, the Asia-Pacific region accounted for around 60% of volume

growth for global spirits; only the much smaller Middle East and Africa regions expanded more in relative terms (Euromonitor International 2017h, cited in Collin and Hill 2019).

Demand in emerging markets is still growing, and growth in value for the industry is from this growth in volume. Industry strategy in the LMICs includes the development of cheap beverages, known as 'affordability initiatives', to compete with informal alcohol and to provide a transition to higher-priced brands. In Latin America and South Africa, these have also been used to expand consumption to new occasions and appeal to new consumers, including women (The Motley Fool 2020).

5.3.2 Consumer marketing

Marketing has long been the dominant feature of the global alcohol production network (Jernigan 2009). More detail about alcohol marketing and marketing control policies is found in Chapter 9. Marketing activities are controlled by corporate leadership and marketing departments located in global headquarters, often in HICs, even when carried out in collaboration with local actors. Therefore, the majority of modern marketing can be considered to cross national boundaries (Jernigan and Ross 2020). Most of the TNACs are headquartered in HICs and profits return there, while increasingly based, in part, on expanding sales into LMICs, with associated increases in alcohol harm. Issues of equity arise, given the profitability of selling alcohol and the extraction of the profits, usually to HICs and individuals, while responsibility for responding to alcohol harm remains that of the national governments in LMICs.

The importance of marketing is verified by the proportion of revenue devoted to 'investment in brands'. In 2019, AB InBev was the eleventh largest advertiser in the world. Another six TNACs were among the top 100 advertisers in 2019: Suntory, Heineken, Diageo, Pernod Ricard Kirin, and Molson Coors (Adbrands 2018).

With the advent of marketing through digital platforms, the TNACs quickly recognized their value to market their products. Diageo now conducts most of its online presence through Facebook and was among the top 20 Facebook advertisers in 2019 (Joseph 2020). By 2017, Heineken had concentrated its advertising and marketing budget on digital platforms, primarily Google and Facebook, in place of traditional broadcasting (Joseph 2017). Industry statistics show alcohol brands elicited the highest digital engagement rates in cross-industry comparisons on Facebook and Twitter (Feehan 2019).

In the mature alcohol markets, digital marketing is playing a key role in relation to younger consumers who live their lives through social media, and is used to promote premiumization and new beverages. 'The Gen Z demographic is "dictating the pace" of no- and low-alcohol, … and brands must look to create new consumption occasions for no- and low- while at the same time ensuring products share the same online space as full-strength alcohol' (Morton 2020b). Many products also target consumption at new social occasions or venues favoured by young people, including home drinking.

Digital marketing is also playing an important role in the growth markets in LMICs. In one example, Pernod Ricard partnered with the Chinese technology

conglomerate Tencent, which holds an immense pool of Internet user data used to target marketing at specific groups. The two companies created many marketing initiatives, including a live chat cocktail platform integrated in WeChat and a local Chinese music channel. Digital connectivity has expanded rapidly into LMICs. In 2020, more than half of the world's population were Internet users (Hootsuite 2020), and the number has been fast increasing, with 300 million people globally going on-line for the first time in 2019. In Africa alone, where connectivity has been relatively low, there was an increase of 42 million going online in 2019. Social media is an important part of digital marketing; globally, 3.8 billion people, i.e. 49% of the world's population, were active social media users in 2019 (Hootsuite 2020). With more than 2.6 billion monthly active users, Facebook is the most popular social network world-wide. Most of Facebook's revenue is generated through advertising, and over 90% of Facebook's ad revenues come in via mobile phone use. Like the TNACs, digital platforms are not subject to international law or treaty (Kelsey 2020; Room and O'Brien 2021) and are now major players in the maintenance and expansion of global alcohol consumption.

Another set of actors important in the nexus of industries promoting alcohol use are the promoters of global events, which are now commonly branded by alcohol products, often replacing tobacco sponsorships. Satellite TV and digital platforms are used to broadcast international sporting events such as FIFA World Cup and Formula 1 racing. Social media engages fans in these events to a far greater extent than previously. Similarly, music festivals are opportunities which are used to ex-pose alcohol brands to young consumers and enhance their engagement with the brands.

Alcohol brands have long-standing relationships and considerable power to nego-tiate the conditions under which these mega events are held. In addition to branding of the events, the teams, and the stadia, conditions are imposed to ensure the sale of alcohol as part of the event. Prior to the 2014 soccer World Cup, the FIFA General Secretary, visiting Brazil to lobby for the repeal of a decades old law which prevented sale of alcohol in football stadia, stated: 'Alcoholic drinks are part of the FIFA World Cup, so we're going to have them. Excuse me if I sound a bit arrogant but that's some-thing we won't negotiate . . . The fact that we have the right to sell beer has to be a part of the law' (BBC News 2012). Similarly, in Russia, advertising restrictions for beer were loosened to allow sponsorship of the FIFA 2018 World Cup by AB InBev's Budweiser brand, and municipal authorities were challenged in court in order to ensure their attempts to maintain alcohol-free sports stadia were overturned (World Cup Russia 2018). A further requirement is that the host government must waive taxes on the sponsor's profits, with an estimated £312 million lost to the Brazilian government in 2014 (Gornall 2014).

5.3.3 Corporate social responsibility

CSR is a primary strategy to burnish the corporate citizenship image of the TNACs and divert attention away from evidence-based effective strategies (Casswell 2019). Where CSR activities reduce environmental impact, as in an area of water use (it

takes approximately 300 litres of water to make one litre of beer from barley) (Water Footprint Network, no date), there are positive environmental outcomes. Heineken has won awards for its efforts to reduce water use in beer production (Business Today 2019). However, the TNACs' alignment of their sustainability agenda to the United Nation's Sustainable Development Goals provides opportunities for increasing their involvement and influence in the global governance arena (Casswell 2019). CSR around water issues also provides opportunities to highlight support for communities through local initiatives. For example, Diageo operates community water, sanitation, and hygiene programmes in Africa and India, which are water-stressed areas that supply their raw materials.

Much CSR activity is focused on mitigating threats inherent to the product such as promotion of 'responsible drinking' programmes in schools in societies with low youth drinking prevalence where the messages normalize drinking (Yoon and Lam 2013). These initiatives have been critiqued for the ambiguity of their messages and lack of focus on the cost-effective, evidence-based alcohol policies included in the United Nation's 'best buys'. A key concern for public health is that such CSR initiatives not only exclude best buys but are concurrent with opposition to them. CSR strategies now incorporate the use of digital media, including messaging about 'drinking responsibly' while offering cues to drink and messaging which increases exposure to misinformation about alcohol harms (Petticrew *et al.* 2020).

CSR activities are promoted by TNACs themselves and by the trade associations which represent alcohol industry interests to the media, the public, and the government, frequently operating beyond national borders, regionally and globally. These are sometimes referred to as **social aspects and public relations organizations** (SAPROs) and have been established to manage issues that may be detrimental to the alcohol industry (Anderson 2004; Babor and Robaina 2013).

Global organizations such as the International Alliance for Responsible Drinking (IARD) and foundations set up by TNACs such as AB InBev (AB InBev Foundation 2020) are complemented by regional organizations such as Cerveceros Latinoamericanos, which represents brewers from 18 countries around the Latin American region and plays a key role in engaging governments in Latin America in the discussion related to **harmful use** of alcohol, and also sponsors activities to reduce alcohol-related harm (Robaina *et al.* 2020). In the South East Asian region, most of the TNACs have CSR foundations which fund training, scholarships, research, and entrepreneurship, as well as charities and disaster relief. In addition to short-term and one-off CSR activities, most TNACs and foundations have long-term CSR initiatives that are often carried out on an annual basis with partners in government and civil society organizations (Amul 2020), building long-term relationships which are valuable in increasing influence in the policy arena (Casswell 2020).

The TNACs and their proxies and affiliated interest groups are influential global players, reflecting their size and profitability. They are responsive to changing circumstances such as increased health consciousness in HICs and the coronavirus disease (COVID-19) pandemic. As described in Box 5.6, the TNACs employ both consumer and stakeholder marketing techniques to maintain profitability.

> ## Box 5.6 COVID-19 pandemic and the alcohol industry's response
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> The coronavirus disease (COVID-19) pandemic presented major challenges to the alcohol industry, particularly with closure and curtailment of sales from restaurants, bars, and pubs. Several countries, including South Africa, India, and Thailand, introduced temporary total bans on alcohol sales (Neufeld *et al.* 2020).
>
> Despite an apparent increase in online sales of alcohol, the pressure of declining on-premises sales has prompted the alcohol industry to seek alternative strategies to maintain profits. TNACs launched various programmes to support jobs and equipment in the hospitality sector. As governments implemented lockdown restrictions, the alcohol industry framed their products as 'essential' and lobbied for retail outlets and takeaway or home delivery services to remain open (Casswell 2020; Collin *et al.* 2020).
>
> The industry was quick to market online in the context of the coronavirus disease (COVID-19) pandemic's restrictions on people's movement and gathering. One study showed that a personal Facebook and Instagram account received one alcohol advertisement every 35 seconds during coronavirus disease (COVID-19) pandemic restrictions (Foundation for Alcohol Research and Education and Cancer Council Western Australia 2020). Ads for Budweiser commiserating with fans about the lack of sporting events, and for Guinness about the closure of St Patrick's day, responded to the frustrations being experienced in lockdowns. According to the researcher analysing these ads, '[a]dvertising during recessionary periods not only shields brands from short-term impacts, but more importantly provides a platform for achieving exponential growth in the long-term' (Toppi 2020).
>
> Many TNACs manufactured alcohol-based hand sanitizers and disinfectants, both highly sought-after products, donating them to health care organizations in LMICs. One brand combined the disinfectant purpose with consumption. Liviko, an Estonia-based global vodka brand, marketed a 'Travel Safe' vodka (ABV of 60%) packaged in small bottles for the Global Travel Retail channel that can double as a disinfectant and a drink (Wehring 2020c).

5.4 Alcohol retailers

Alcohol retail is an important part of the industry nexus, and ensuring easy access to purchasing alcohol is essential for the producers. The International Alcohol Control (IAC) study reported it was common for drinkers in all of the ten participating countries, both high- and middle-income, to be able to access alcohol in 10 minutes or less (Gray-Phillip *et al.* 2018). An aborted CSR public–private partnership between Heineken and the United Nations' Global Fund (in order to facilitate delivery of vaccines and medicines) was predicated on Heineken's excellent distribution networks in rural Africa, enabling it to distribute beer to 'the last mile' (Casswell 2019).

Alcohol is sold for consumption on premises and to take away. HICs have developed licensing systems or other forms of regulation such as public ownership of retail

outlets. In these, a clearer distinction between licensing on- and off-premises retail is apparent; however, in LMICs, the distinction is less clear, with grocery stores/eateries selling alcohol for takeaway and for drinking on premises (including in informal seating outside) (Gray-Phillip *et al.* 2018).

Globally, more than 40% of expenditure on alcohol drinks is attributable to consumption away from home, highlighting the importance of on-premises sales for the production industry (Statista 2020b). Reflecting this, during the coronavirus disease (COVID-19) pandemic, TNACs around the world supported provisions for on-premises retail outlets to stay open during lockdowns, or to recover their Latin-American losses by selling alcohol in other ways (Morton 2020c; Sousa 2020). While the revenue from on-premises sales is significant, it is common for only a minority of the alcohol sales to be consumed in on-premises outlets (Gray-Phillip *et al.* 2018).

Countries vary in the extent to which takeaway alcohol, and sometimes a specific alcoholic beverage, is sold only in alcohol-specific shops and whether general convenience stores and supermarkets can sell alcohol. For example, in the Nordic countries (other than Denmark) which have retained some public ownership of alcohol retail, alcohol is sold mainly from alcohol-specific outlets, although less potent beverages are sold in grocery and convenience stores (Karlsson *et al.* 2020; Olsson *et al.* 2002). In many other countries, the sale of alcohol alongside other commodities is common.

The expansion of alcohol into supermarkets in some HICs increased consumption (Zhang and Casswell 1999) and made it more palatable for women to purchase (Wyllie *et al.* 1993). Supermarkets have advertised cheap alcohol products, suggesting they are being used as 'loss leaders' to attract customers to shop for groceries once in the store. Supermarkets have become a major retail segment in many countries. In Mexico, for example, Superama is the leading operator in the hypermarket and superstore sector, and accounts for almost half of all alcohol sales (Robaina *et al.* 2020). Superama is owned by Walmart, which is one of the biggest corporate entities globally, and was ranked the number one retailer in 2019, based on company revenue, size, and investments in online marketplaces. In 2020, Walmart expanded its alcohol product range to include more premium products in the United States. Alcohol is also widely sold in convenience stores. The largest global chain of 24-hour convenience stores, 7-Eleven (Lindenberg 2020), sells alcohol in many countries and has considerable market share.

Various governments have tried to control the extent to which retailers' interests are linked to those of the major alcohol producers by supply agreements, financial loans, or sometimes ownership. The United States established a three-tier system to separate producers, wholesalers, and retailers. However, in 2011, Costco, a large retailer that also covers wholesaling functions for other products, managed, after two campaigns, to get a ballot initiative approved by voters in the state of Washington, abolishing the state's liquor monopoly, as well as the three-tier system in that state (Jernigan and Ross 2020). The rapid spread of online delivery will further weaken the United States' three-tier system (Wehring 2020a).

The expansion of online purchase and delivery, often by a third party, has implications for public health (see Box 5.7). Globally, many consumers experienced online delivery for the first time in the coronavirus disease (COVID-19) pandemic. In New Zealand, for example, 18% used online delivery for the first time during coronavirus disease (COVID-19) pandemic restrictions and use was more likely among heavier drinkers; most reported seeing at least one ad for online delivery every day, and one in

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Box 5.7 Expansion of availability via online sales

Online alcohol delivery is a rapidly emerging industry strategy, in line with on-line purchases more generally, and has increased the availability of alcohol. Growth in online retailing has occurred in high- and low- and middle-income countries, with China's online alcohol delivery market growing annually by 15% (Wang 2018). Online alcohol delivery is associated with heavier drinking and may facilitate heavier drinking through rapid and repeat delivery to drinkers already intoxicated (Mojica-Perez *et al.* 2019). Studies have shown age identification checks of younger recipients are not always made. Home delivery of alcohol is commonly promoted on social media, providing a seamless transition from the marketing message to purchase. A sudden expansion of online alcohol delivery occurred in many countries during the coronavirus disease (COVID-19) pandemic, an industry response to restrictions on the sale of alcohol through other outlets during lockdowns (Huckle *et al.* 2021). For example, 'Tienditas Cerca', a programme conducted by Grupo Modelo in Mexico and Cervepar in Paraguay, offered a free online ordering platform for home delivery services to more than 12,000 retailers (Ze Delivery 2020). The increased use of online delivery services has highlighted an already existing problem—insufficient policy in place to mitigate harms from online alcohol delivery.

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four male users of online delivery reported ordering again after running out of alcohol during a drinking session (Huckle *et al.* 2021).

Retail outlets and bars have long participated in the marketing of alcohol by advertising price promotions and venue events; however, there has been an expansion in marketing by retailers driven by digital technology opportunities. The digital platforms are multi-sided market infrastructures which optimize relationships among consumers, businesses, and the platforms (Nieborg and Helmond 2019) and combine sale of advertising with retail and distribution plug-ins (Carah and Brodmerkel 2021). Data collected from online shopping are analysed to create a valuable profile of the user (Stillman and Letang 2015; Martínez-Martínez *et al.* 2017) for further marketing purposes, as well as for providing a seamless purchasing opportunity.

Emphasizing the importance of the link with online delivery, Amazon, the major global marketing platform, has introduced its own alcohol brand. Amazon launched its Tovess gin label in the latter half of 2019, signalling the platform's ambitions in the premium spirits space (IWSR Drinks Market Analysis 2020a).

The complex relationships among producers, wholesalers, and retailers mean that the hospitality and alcohol retail industries have their own distinct perspectives on some regulatory issues but align with alcohol producers on others.

5.5 Unrecorded alcohol supply

Informal production is part of what is often referred to as 'unrecorded' consumption—alcohol not registered in the jurisdiction where it is consumed (see Chapter 3). Health risks due to informal alcohol often receive considerable publicity; however, the extent

of these risks is often overestimated. Media coverage often relates to methanol poisoning. However, recent reviews (Okaru *et al.* 2019; Lachenmeier *et al.* 2021) came to the conclusion that, except for methanol poisoning, the public health impact of unrecorded alcohol is similar to that of recorded alcohol and is mainly dependent on the volume of ethanol consumed and the patterns of drinking.

Low prices and ready availability of informal or illegal alcohol are of concern to commercial producers, as it undercuts their products in the market. TNACs moving into markets in LMICs lobby for policy moves against informal products as part of their CSR activities. They emphasize the quality of their production methods, offer technical advice, support the regulation and taxation of alcohol from all sources (International Alliance for Responsible Drinking 2018), and ask for taxation decreases to take away the competitive advantage of unrecorded alcohol (Lachenmeier *et al.* 2021).

Some global companies have also moved into direct competition with informal beverage producers by marketing industrialized forms of traditional beverages and offering products at competitive price points. For example, SABMiller played a role in bringing village production and sale of traditional 'cloudy' beer made from sorghum under South Africa's licensing system (Parry 1998), and now makes sorghum beer, as well as European style lager, on an industrial scale. Pricing strategies to increase consumption of commercial brands have also been used, e.g. in South Africa where SABMiller priced beer at or below the inflation rate deliberately in order to challenge consumption of informal alcohol and doubled the commercial market (Bouckley 2012).

5.6   Conclusion

The globalization of the alcohol industry in recent decades has been facilitated by trade and investment agreements and the highly profitable nature of alcohol products. The TNACs, particularly the largest beer and spirits producers, have—through investments, mergers, and acquisitions—expanded into LMICs in Latin America, Asia Pacific, the Middle East, and Africa, and these have become increasingly important for their global markets. In the context of economic growth, extensive marketing, and limited alcohol policy controls at the national level, as well as no regulation at the global level, this expansion into LMICs has created a 'perfect storm' reflected in increased consumption and harm (Casswell 2020).

Stabilization in alcohol consumption in HICs has encouraged not only expansion into new markets in LMICs, but also a focus on increased value in HICs. Profits are enhanced by premiumization, in which consumers move to more highly priced brands, and the development of new products, such as no- and low-alcohol beers, in response to increasing health consciousness.

Marketing to both consumers and stakeholders remains a crucially important industry strategy. The development of digital platforms in the past decade has dramatically changed the nature of alcohol marketing and provided powerful opportunities for the industry. In 2019, alcohol brands were reported to elicit the highest digital engagement rates in cross-industry comparisons in major social media platforms (Feehan 2019). Digital marketing has provided increasingly seamless opportunities

for online purchase, supplementing traditional retail outlets and creating new challenges for alcohol policy. The size and profitability of TNACs and their proxy organizations also support extensive CSR activities to indirectly promote the policy interests of the industry, as will become apparent in Chapters 14 and 15.

The supply side and marketing developments described earlier have implications for how we understand national alcohol markets and the need for effective local and national alcohol policies to be supported by international and regional responses. The challenge countries face in efforts to reduce alcohol harm using the effective strategies outlined in Chapters 7 to 13 are met by highly sophisticated, integrated marketing strategies and other well-funded industry efforts to influence policy outcomes. The lack of regulation to protect health at the global level provides considerable challenges for researchers, the public health sector, and governments alike. Responses using both national and global public health strategies are needed to minimize the health consequences and social harms resulting from expanded use of alcohol beverages.

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6

Overview of strategies and interventions to prevent and reduce alcohol-related harm

6.1 Overview

By all accounts, the global scope of alcohol-related problems is enormous, representing one of the most significant and preventable threats to population health globally. Previous chapters of this book have explored the causes and consequences of alcohol-related problems and the issues that need to be addressed for reasons of public health. In this chapter, we set the stage for a review of policy evaluation research to be described in more detail in Chapters 7 to 13.

Table 6.1 presents an overview of the seven key policy areas that constitute the current public health approaches to alcohol-related problems. It also describes the theoretical assumptions and broad policy goals that underlie these different approaches to alcohol policy. The assumptions suggest that alcohol consumption and alcohol-related problems can be reduced by a variety of mechanisms, including demand reduction, supply control, environmental constraints, deterrence, social pressure, health information, marketing restrictions, and treatment services. Subsequent chapters document the extent to which these assumptions are supported by available research evidence.

As indicated in the last column of Table 6.1, many policies and interventions are directed toward reversing problems resulting from practices of the alcohol industry (described in Chapter 5). These practices are epitomized by the seven Ps of the 'marketing complex,' a term that refers to the products and services used to develop loyal customers and to increase profitability (Borden 1964; Gummesson 2008): (1) the Product; (2) its Price; (3) its Place (how the product is distributed and made available to the customer); (4) the Promotion (how the customer is identified and persuaded to buy); (5) the People (all those in the production and supply chain); (6) the Process (the systems and processes that deliver the product to a customer, e.g. targeting of susceptible 'market segments'); and (7) the Physical characteristics (product packaging and sales environment). Table 6.1 specifies how alcohol policy responses are implicitly or explicitly directed at each of these practices.

Pricing strategies (see Chapter 7), often implemented through taxation policies, can be used to control alcohol consumption, reduce problems, and raise revenues to compensate for societal economic costs imposed by alcohol. Strategies directed at the physical availability of alcohol (see Chapter 8) are translated into laws and regulations that make alcohol less convenient to use and thereby prevent short- and long-term consequences of over-consumption. Controls on the marketing of alcohol are strategies (see Chapter 9) designed to reduce the attractiveness of alcohol, particularly to

Table 6.1 Public health policy options, theoretical assumptions, broad policy goals, and industry strategies addressed

Public health options	Examples of public health strategies and interventions	Theoretical assumptions and broad policy goals	Industry strategies addressed
Pricing and taxation policies	Alcohol excise taxes; minimum price; bans on price discounts and promotions; additional taxation on youth-oriented beverages	Increasing economic cost of alcohol relative to other commodities and to available income will reduce demand for alcohol by decreasing affordability of alcohol	Use of price promotions to increase sales and to promote higher amounts of drinking
Regulating physical availability	Restrictions on time, place, and density of alcohol outlets; minimum legal purchase age; government monopoly of retail sales	Reducing supply by restricting physical availability will increase effort to obtain alcohol, and thereby reduce total volume consumed as well as alcohol-related problems	The greater the number of places where alcohol products can be sold and consumed, the greater the profits from increased sales
Regulating alcohol marketing	Total ban; partial ban; age restriction on access to alcohol industry websites	Reducing exposure to marketing which normalizes drinking and links it with social aspirations will slow recruitment of young drinkers and reduce heavier drinking	Alcohol promotion stimulates brand loyalty and sales
Education and persuasion	Public service announcements; social media campaigns; warning labels; low-risk drinking guidelines; school-based and other youth education programmes; comprehensive community programmes	Health information that increases knowledge and changes attitudes may prevent drinking problems	Alcohol promotion helps to recruit new consumers, stimulates brand loyalty, and increases sales

(continued)

Table 6.1 Continued

Public health options	Examples of public health strategies and interventions	Theoretical assumptions and broad policy goals	Industry strategies addressed
Drink-driving countermeasures	Low or lowered blood-alcohol concentration (BAC) levels; random breath testing; sobriety checkpoints; administrative licence suspension; severity of punishment; graduated licensing for novice drivers; intensive supervision programmes; interlocks	Deterrence and punishment will reduce drink-driving	Places where alcohol is served to drinking drivers, and the people who serve them, account for significant profits to the industry
Modifying the drinking context	Peer-focused interventions; on-premises training and policies; enhanced enforcement; proactive and targeted policing; regulatory coordination; legal liability; targeted regulations; comprehensive community approaches	Environmental and social constraints will limit alcohol consumption and reduce alcohol-related problems	Staff behaviours (People, Process) and contextual characteristics (Price, Place, Promotion, Process, Physical characteristics), can increase sales in commercial drinking contexts
Conduct screening and brief intervention in health care settings; increase availability of treatment	Brief intervention with at-risk drinkers; mutual help/self-help attendance; mandatory treatment of drink-driving repeat offenders; medical and social detoxification; talk therapies; pharmacological therapies	Alcohol problems will be prevented by motivating heavy drinkers to drink moderately; various therapeutic interventions will increase abstinence or reduce drinking levels among persons with alcohol use disorders	All of the above

youth and other vulnerable populations, and to disrupt the normalization of alcohol use and patterns of heavy consumption.

Beyond these universal strategies directed at the entire population, alcohol control options also include interventions directed at individual drinkers, the environments in which they drink, and specific problems such as alcohol-impaired driving (see Chapters 10 to 13). Interventions may be implemented by a variety of organizations, including governmental agencies, health departments, and non-governmental organizations. Common types of intervention include school-based prevention classes, screening programmes, treatment services, random breath testing of automobile operators, and controls imposed on the drinking environment to prevent intoxication and alcohol-related problems.

Often interventions are implemented in an uncoordinated way, without consideration of potential synergistic effects (see Chapter 16) or their unintended consequences. This may be especially true for strategies focused on individuals and drinking environments. Ironically, many of these strategies and interventions can be seen as direct attempts to reverse the problems resulting from the practices of the alcohol industry, as described in Chapter 5.

In some cases, policies persist despite evidence that the strategy is flawed or the outcome is inconsequential with regard to reducing alcohol-related problems (e.g. alcohol education as a prevention activity for adolescents). To understand why policies succeed or fail to accomplish their aims, the growing area of alcohol policy research not only evaluates the effectiveness of policies, but also considers the mechanisms that explain how policies are related to outcomes. In Section 6.2, we describe the methodological approaches and rules of evidence that establish the scientific basis for the strategies and interventions to be discussed in more detail in Chapters 7 to 13.

6.2 Methodological approaches

A variety of methodological approaches have been used to assess the impact of alcohol control strategies, as well as policy-relevant prevention and treatment interventions. These include experimental studies, survey research, analysis of archival and official statistics, **time-series analyses**,[1] qualitative research, and **natural experiments**.

The appropriateness of any research method for alcohol policy evaluation depends on the strategy or intervention under study, the current state of knowledge, the availability of valid measurement procedures, and the ways in which the information will be put to use (McKinlay 1992). The most conclusive evidence in the behavioural and medical sciences comes from **randomized clinical trials** (RCTs) or randomized experiments where individuals or entities (e.g. drinkers, bars, communities) are randomly assigned to an intervention group or an untreated control group, and the results compared. RCTs are considered the gold standard in evaluation because the random assignment rules out other explanations for differences found between

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

the experimental and control conditions. An example of the use of an RCT design is the evaluation of a school-based preventive intervention where some students or schools are randomly assigned to a no-intervention control group and other students to a programme that teaches alcohol resistance skills. As with other methodologies, RCTs can have limitations, such as a lack of generalizability (Greenland 2017), when well-resourced programmes are used that are not typical of the real world.

Though they are few in number, there are now some intervention studies that take the community as the unit to be randomized (e.g. Wagenaar *et al.* 2000). And in very rare cases, studies have even tested the effects of an alcohol control measure by random assignment of different regions of a country to the intervention and the control condition (e.g. Rossow and Grøtting 2021). However, RCTs are difficult to implement for some types of interventions. For example, it is usually not feasible to randomize a group of communities to pay higher taxes on alcohol, while a comparison group of communities pay lower taxes. For these reasons, researchers often use non-experimental (observational) methods to infer what happens when a policy is implemented or changed in a particular area, or cross-sectional studies to compare sites that have different policies. However, these studies provide only weak evidence of effectiveness because of potential sources of **confounding**. For example, a policy may be implemented when the problem to be addressed is abnormally high and the observed reduction in the problem may reflect the problem returning to its normal level. This is known as **regression to the mean**. Similarly, findings of lower problems associated with policies that are in one community but not in another may reflect differences between the communities that have nothing to do with the policy.

Quasi-experimental research is used when RCTs are not possible, feasible, and/or ethical. This method typically involves before- and after-measurement of a group, community, or other jurisdiction that is exposed to an intervention (experimental condition), with similar measurement conducted in comparable groups or communities where no intervention took place (control condition). It is called 'quasi-experimental' because it lacks the random assignment to conditions that is part of a true experiment and therefore cannot rule out pre-existing differences between the communities.

Natural experiments, a type of quasi-experimental design, have played an important role in the evaluation of many alcohol policy interventions. It is called a 'natural' experiment because the researcher typically has no control over the change and when it happens. For example, when sobriety checks (see Chapter 11) are implemented in one jurisdiction, and not in an adjacent one, the relative impact of the programme can be examined through comparative analysis of archival data such as accident rates or drink-driving arrests. Such studies have credibility insofar as they are conducted under real-world conditions; however, we cannot draw causal inferences as confidently from them as we can from RCTs. Studies of natural experiments typically involves before- and after-measurement of a group, community, or other jurisdiction that is exposed to an intervention, compared to the same measurements in comparable groups where no intervention took place. Natural experiments have played an important role in the alcohol policy evaluation literature, despite the possibility of bias and confounding. Evidence relevant to alcohol policies also comes from studying what happens when an intervention is removed, in comparison with another time or place when there is no change in the intervention, although the effects of removing an intervention may not be symmetrical with the effects of its introduction.

Studies that monitor the change process using methods such as time-series analysis provide the strongest evidence from natural experiments. Box 6.1 and Figure 6.1 describe the use of interrupted time-series analyses to evaluate changes in alcohol-related mortality and morbidity following implementation of a policy or intervention,

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Box 6.1 Interrupted time-series methodology for evaluating alcohol control interventions

Alcohol control policies are designed to reduce attributable harm. The simplest way to evaluate their effects is to compare either alcohol consumption or alcohol-related harm before and after the intervention. There are a number of problems associated with this 'before–after' approach (Cook and Campbell 1979; Shadish *et al*. 2002):

1. Other events may have happened at the same time which had an impact on the outcome variables of interest.
2. Secular trends (i.e. market activities likely to continue in the same general direction over a long period of time) may have produced differences independent of the interventions.
3. If the intervention has been discussed in public, the effects may start even before its implementation.
4. Depending on the policy and its implementation, the effects may actually be delayed, and therefore not measurable soon after the change.

One methodology that is able to control for many of these problems is interrupted time-series analysis (Bernal *et al*. 2017; Beard *et al*. 2019). Time-series analyses are regression-based statistical methods used to assess trends in repeated measurements and their associations with events, such as a new policy, which are expected to 'interrupt' the trend. This means that secular trends are identified as a key feature. The interrupted time-series tests must also include details on external events that may have an impact on the time-series, in addition to the implementation of an alcohol control policy. In simple terms, it establishes a time trend before the intervention. For example, alcohol-attributable mortality was increasing in Alaska before the 1983 tax increase, dropped sharply shortly after, and then increased gradually to the pre-tax levels over a 20-year period (Wagenaar *et al*. 2009). With interrupted time-series analyses, it was possible to quantify the impact of the intervention. To do so, seasonal patterns (mortality rates fluctuate seasonally in a systematic way) were identified and removed, as well as long-term trends and potential confounders such as economic factors. To make sure that no other event happening at the same time had an impact on the series, control series are often introduced. For instance, in the above-cited example regarding Alaska (Wagenaar *et al*. 2009), the authors used all other US states as a control and this was incorporated into their analyses. Similarly, in the first evaluation of the effect of implementation of a Minimum Unit Price on alcohol purchases in Scotland, data from Northern England, a similar region without this kind of a policy change, were used for the control series (see Chapter 7, as well as O'Donnell *et al*. 2019).

> In summary, interrupted time-series with a control series is an ideal way to evaluate the short- and long-term impact of alcohol policies, and its increased use in alcohol research is an indication of how the rigor of experimental designs can be combined with the practical reality of evaluating a natural experiment. Despite these advantages, suitable data are not always available for such analyses.

and to illustrate how this research method can be used to study both short- and long-term effects of new policies.

The various modes of data collection used in policy evaluation research have different advantages and drawbacks. Social surveys, for example, generally measure attitudes, intentions, and behaviours through direct questioning. Studies based on survey data tend to be descriptive, correlational, and subject to the limitations of self-report methods, sample representativeness, and non-response (Rehm *et al.* 2021b). Data collected by social and health agencies (e.g. police statistics, hospital discharge data, mortality records) have different strengths and weaknesses. By definition, they give a good picture of the agency response in an area, but the available data, often collected for administrative, rather than research, purposes, are influenced by cultural perceptions,
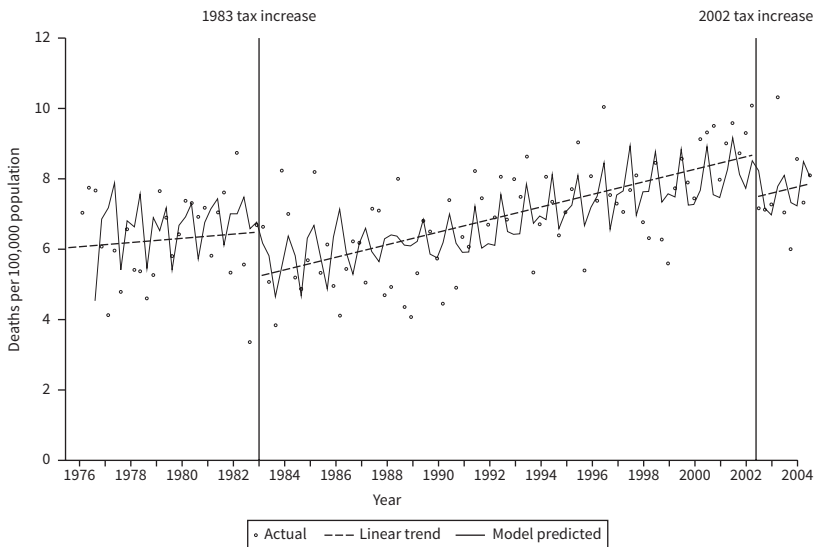
Figure 6.1 Example of interrupted time-series analysis showing how increases in alcohol excise taxes in 1983 and 2002 affected the quarterly rate of alcohol-related disease mortality per 100,000 population aged 15 years and older in the State of Alaska, United States, between 1976 and 2004.

Reproduced with permission from Wagenaar AC, Maldonado-Molina MM, and Wagenaar BH (2009a) Effects of alcohol tax increases on alcohol-related mortality in Alaska: Time-series analyses from 1976 to 2004. *American Journal of Public Health* 99, 1464–70.

agency priorities, and recording practices (and may also be reactive to the intervention itself, e.g. arrest rates may go up, even when crime goes down, if an intervention makes the police feel under scrutiny). Quantitative research methods can be complemented by qualitative studies, such as ethnographic interviewing, participant observation, case studies, and focus group interviews.

In addition to studying whether and how a policy works, it is also valuable to evaluate a policy's effectiveness and societal benefits in relation to its costs. The two most widely used forms of economic evaluation are cost–benefit analysis (CBA) and cost-effectiveness analysis (CEA). In CBA, the evaluation examines the relationship between benefits and costs of a policy, with both variables expressed in monetary terms, making it possible to determine whether the monetary benefits of a particular policy exceed its costs. A crucial issue in interpreting such analyses is whether private costs, as well as costs to governments, are measured and included. In CEA, the evaluation focuses on the least costly way to achieve the benefits of a policy. Typically, this form of economic analysis compares alternative policies or programmes that could be used to achieve the same objective (e.g. sobriety checkpoints vs random breath testing for drink-driving), with the results expressed as costs needed to produce a unit of a health outcome such as a life saved. Both approaches provide useful information to the policymaker.

6.3 Rules of evidence

With these methodological considerations in mind, the strategies and interventions discussed in Chapters 7 to 13 were systematically evaluated on the basis of the following rules of evidence. First, the world literature on each area was reviewed and critically appraised by one or two of the authors, with others serving as secondary reviewers. Special attention was given to research developments during the last decade, in part because of the dramatic increase in research since the second edition of this book was published. Where appropriate, the emphasis was on studies with better research designs.

The variety of approaches, wide scope of the literature searches, and expert involvement have led to detailed evaluations and careful weighting of the existing evidence. Still, potential biases may be present due to missed studies and selectivity of inclusion. For some strategies and interventions, the research basis is relatively small, and for others, the conclusions drawn from review articles can differ because the authors focused on different parts of the literature or used different statistical techniques. Box 6.2 provides additional explanations for apparent contradictions in assessments of the literature.

Another limitation of an undertaking of this kind is that most of the research reviewed in Chapters 7 to 13 originated in English-speaking and European countries. To compensate for the relative lack of research in other parts of the world, the authors gave careful consideration to the cross-national generalizability of findings from particular studies and external experts were commissioned to review the policy developments and relevant scientific literature in key countries (Gururaj *et al.* 2021) and regions (Medina-Mora *et al.* 2021; Morojele *et al.* 2021; Neufeld *et al.* 2021; Rehm *et al.*

Box 6.2 Contradictions in assessments of the literature

The scientific literature on effects of alcohol policies comprises a large number of published studies. In any one specific policy area where the preponderance of evidence suggests effectiveness, there will be single studies showing no effect or even the opposite effect.

An intervention effect may vary across societies or between population groups, due to differences in local circumstances or cultural framings. Thus, contradictory findings with regard to policy effects may sometimes reflect real differences.

Conservative methodology and relatively small effect sizes can often explain why single studies have reported no statistically significant effect. **Meta-analyses** thus yield more robust evidence on effectiveness. Also, some published primary studies report findings based on inadequate methodology. Hence, a critical review and assessment of primary studies is essential. This is often done in **systematic reviews**.

Among literature reviews, there are also examples of different reviewers of the same literature coming to different conclusions. For instance, the vast majority of reviews conclude that taxation and pricing do impact consumption and harms, yet a few exceptions exist. There are several reasons for why authors may come to different conclusions, including differences in the selection of primary studies and in the ways used to summarize the findings.

One underlying factor is vested interests in study outcomes. Research funded by the alcohol industry is often biased toward industry interests (McCambridge and Mialon 2018). Correspondingly, prevention programme developers may have economic or other interests in obtaining favourable results when evaluating their own programmes (Pape 2009). Unfortunately, funding sources that entail financial conflicts of interest are not always revealed. In policymaking, there are many examples of 'cherry-picking' from the research literature. Those who look for studies that fit their initial views will almost certainly find such examples in the literature. This explains why findings in a specific area are rarely consistent.

Despite inconsistencies in the interpretation of research findings, eventually the cumulative literature on many of the strategies and interventions considered in this book becomes so compelling that a clear scientific consensus emerges. No amount of legitimate differences between study findings, research bias connected with funding sources, or cherry-picking of results can negate the preponderance of evidence in many areas of alcohol policy research, as will become apparent in the following chapters. Although science can never be expected to provide definitive answers to every policy question, confidence in the kinds of causal statements policymakers hope for (i.e. under circumstances 'C', intervention 'A' reduces alcohol-related mortality by X%) increases with the number of replication studies, the quality of the research evidence, and the plausibility of the confirmed hypothesis.

2021a) where the majority of the world's drinking population can now be found; however, there is little in the English language literature on the effectiveness of alcohol policies there. Finally, the book's co-authors had a series of meetings and teleconference calls to review and critique the contents, findings, intervention ratings, and conclusions of each chapter.

6.4 Conclusion

Evaluation research is necessary in order to measure whether a policy has any impact and to provide a 'reality check' to high expectations often attached to promising new initiatives. Evaluation also needs to be part of ongoing monitoring. Evidence from one time period may not necessarily be applicable to situations emerging in another era, and policy effects may erode over time. And evidence from **high-income countries** may not always be applicable to **low- and middle-income countries**, and vice versa. Furthermore, policymakers often want locally based evidence, rather than relying on findings from far afield, fearing lack of applicability of findings to their jurisdiction.

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7

Controlling affordability: pricing and taxation strategies

7.1 Introduction

This chapter considers the aims, mechanisms, and effects of alcohol taxation and pricing policies, two crucial economic strategies that have substantial implications for the prevention of alcohol-related problems. Economic research and theory are reviewed to evaluate how alcohol prices affect alcohol consumption and associated harms and what other factors moderate the effects of price changes.

7.2 Aims of formal controls over beverage prices

In the absence of any formal controls over production, distribution, and sales, the prices of alcoholic beverages would be set by market conditions purely on the basis of supply and demand. However, 95% of the 164 countries reporting to the World Health Organization (WHO) in 2016 have policies that increase alcoholic beverage retail prices over their production and distribution costs, and generate revenue to help cover the cost of alcohol-attributable harm (see Chapter 4) (World Health Organization 2018, pp. 109–10).

In the nineteenth century, taxation of alcoholic beverages was an essential source of state revenue (Room *et al.* 2002) in many **high-income countries**[1] (HICs), but currently, alcohol taxation accounts for about 1–2% of state revenues in HICs and a somewhat higher proportion in **low- and middle-income countries** (LMICs).

Apart from tax revenue generation, governments also apply taxation and pricing regulations as policy instruments to control alcohol consumption and its related harms (World Health Organization 2013), since a higher price encourages less consumption by drinkers and discourages initiation of drinking by non-drinkers. Taxes can be used specifically to cover costs of alcohol's harms to the drinker and to others, which is known as a **Pigouvian tax** (Sornpaisarn *et al.* 2017).

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

7.3 Mechanisms and terminology: supply, demand, price, and contextual factors

Basic economic theory posits that an increase in alcoholic beverage prices will reduce alcohol consumption, as consumers with limited resources will choose to purchase less.

A state may impose or increase alcohol excise duties, or increase the price of alcoholic beverages in some other way. Increased excise duty rates usually lead to increases in alcoholic beverage prices (Nelson and Moran 2019), and the increase in beverage prices usually leads to a reduction in alcohol consumption. How responsive the demand for alcoholic beverages is to changes in price will determine how the change will affect consumption and related harms.

Economists use the term **price elasticity of demand** when describing how changes in price impact consumption. This is defined as the percentage change in consumption resulting from a 1% increase in its price, keeping all other factors (e.g. income, price of other products) constant. For example, price elasticity for alcohol of −0.5 implies that a 1% increase in its price would reduce alcohol consumption by 0.5%. If the price elasticity of demand has a value between zero and −1.0, the demand for a commodity is said to be **price inelastic** with respect to its own price, as a change in its price results in a relatively smaller change in its consumption. Conversely, with a value below −1.0, the demand is said to be **price elastic**, as the consumption change is proportionally greater than the price change. A rise in price will thus produce some reduction in consumption, even if the commodity is price inelastic, so long as the price elasticity of demand is not zero or higher. In this situation, alcohol excise taxes can serve two purposes—reducing consumption and harm, and raising government revenue.

Alcohol taxation typically differs by beverage (Österberg 2011), and a tax change will often apply to one beverage category. A resulting increase in price for one beverage may not only result in lower demand for that beverage, but also increase the demand for other alcoholic beverages. The magnitude of this effect is termed **cross-price elasticity of demand** and is defined as the percentage change in demand for one commodity (e.g. spirits) resulting from a 1% increase in the price of another commodity (e.g. beer) (Moffatt 2013). For example, a cross-price elasticity of spirits with respect to beer of 0.5 implies that spirits consumption increases by 0.5% because of a 1.0% increase in beer price. Economists describe two commodities as substitutes if, when the price of A increases and demand for it falls, consumers buy more of B, but if they also buy less of B, the commodities are called complements.

Many factors, including taxation and other government regulations, influence alcohol prices. The effectiveness of an alcohol tax increase will depend on the **tax pass-through** to price, which is influenced by market conditions, product heterogeneity, price level, and retailer concentration and location (Nelson and Moran 2019). A systematic review and **meta-analysis** of research on tax pass-through to price, using 29 studies conducted in many countries, concluded that taxes of all alcoholic beverage categories are generally fully passed through to prices, with price effects occurring within 3 months of tax changes (Nelson and Moran 2019).

Other factors that influence the effectiveness of alcohol taxation include affordability, income, and inflation; these are further discussed in Section 7.8.1. While taxation has been shown to work in general to reduce alcohol-attributable harm, this is influenced by an array of contextual factors (Room *et al.* 2009). Often tax increases do not cover the decrease in currency value from inflation, so even after tax increases, the affordability of alcohol still increases. For example, among the seven increases in taxation over the past two decades in Lithuania (Rehm *et al.* 2019b), only one of them (in 2017) led to decreases in affordability. Not all taxation is passed through to the price. Sometimes the producers decide not to raise the price proportionately, and at other times, they use taxation as an excuse to increase the price disproportionately (e.g. Ally *et al.* 2014).

7.4 Policy interventions affecting the affordability of alcoholic beverages

A range of alcohol policy interventions can influence the affordability of alcoholic beverages. **Excise taxation** imposes a tax on specific goods, usually luxury goods or goods considered to generate harms or costs to others (**negative externalities**), the latter applying to alcoholic beverages (Cnossen 2005). **Minimum unit pricing** prohibits the sale of alcoholic beverages to consumers below a designated price per unit of ethanol (Sornpaisarn *et al.* 2017). In some countries, there are also minimum prices for specific beverages often marketed to youth and heavy drinkers. Bans on sales below cost prevent sellers from setting the price below their cost of doing business or some other proximal price (Hunt *et al.* 2011). Restrictions on sales promotions prohibit discount marketing strategies that sellers temporarily use to enhance alcohol sales, such as 'two-for-one' promotions, volume discounts, and 'happy hours' (Hunt *et al.* 2011), all marketing activities that facilitate heavy drinking.

There are enormous variations among countries worldwide in applying such policy strategies affecting affordability. Of the 164 countries worldwide that responded to the 2016 Global Survey on Alcohol and Health, 95% employ excise taxation for beer, 7% utilize minimum unit pricing, 2% have bans on below-cost selling, and 4% employ bans on volume discounts (World Health Organization 2018). However, only 26% reported adjusting their excise taxes for inflation, despite the fact that a fixed tax rate will be reduced by inflation as a relative cost.

7.5 Effectiveness of taxation

Three main types of taxation are utilized for alcohol products: general tax (e.g. value-added taxes and sales taxes), customs taxes (imposed on imported goods), and excise taxes (imposed on specific goods such as alcohol and tobacco) (see details in Sornpaisarn *et al.* 2017). In this chapter, the focus is on excise taxation, a widely used policy tool applied to alcohol products specifically, not only because of the potential for revenue generation, but also because of alcohol's detrimental social and public health consequences.

7.5.1 Effects of price/tax changes on alcohol consumption

The effect of price changes on alcohol consumption has been extensively investigated. Since 2006, eight meta-analyses have systematically summarized the results of relevant econometric studies (Fogarty 2006, 2010; Gallet 2007; Wagenaar *et al.* 2009b; Collis *et al.* 2010; Elder *et al.* 2010; Nelson 2013a; Sornpaisarn *et al.* 2013). The reviews mainly covered studies from HICs, and only one review specifically examined studies from LMICs (Sornpaisarn *et al.* 2013). All eight reviews consistently reported that a price increase leads to a decrease in consumption, and when prices go down, consumption goes up. Table 7.1 provides the summary measures of price elasticity of demand by beverage type from these eight meta-analyses. Overall, total alcohol has an average short-run price elasticity of approximately −0.5, with −0.4 for beer and −0.7 for both wine and spirits. Price elasticity tends to be lower for the alcoholic beverage used most in a country (Fogarty 2006). The lower value for beer probably reflects the fact that the majority of studies of alcohol price elasticity are from beer-drinking countries. Recent studies from Australia (Jiang *et al.* 2015, 2016), Chile (Araya and Paraje 2018), Ecuador, Mexico, and Venezuela (Medina-Mora *et al.* 2021), India (Kumar 2017; Gururaj *et al.* 2021), and Vietnam (Chelwa *et al.* 2019) consistently corroborate the robust findings of an inverse relationship between alcohol price and consumption. Figure 7.1 provides an illustration of such an inverse relationship in Ukraine (Chaloupka *et al.* 2019).

Price elasticities in HICs and LMICs are similar (see Sornpaisarn *et al.* 2013). Short-run estimates are typically more inelastic than long-run estimates (Gallet 2007; Nelson 2013b), meaning that consumers reduce their drinking more in the longer than in the shorter term after a tax increase.

While meta-analyses provide a consistent overall picture of demand responsiveness to alcohol price changes, there is large variation in price elasticity estimates across individual studies (e.g. Fogarty 2010; Sornpaisarn *et al.* 2013; Medina-Mora *et al.* 2021). Some of the variation may reflect methodological differences across studies. There are also examples where tax changes had no effect on alcohol consumption. For instance, there was no increase in consumption after a tax cut in Denmark in 2003 (Room *et al.* 2009), and consumption increased even though prices increased in Ireland during 1969–1980 (Thom 1984) and in Sri Lanka (Selvanathan and Selvanathan 2005a). However, in such instances, other factors have supervened. In Ireland, there was a substantial increase in national income and prosperity during that period.

Studies suggest that the effects of price on consumption may also be affected by other alcohol control measures in place. For example, in the United States, alcohol was generally less price elastic in states with restrictive alcohol controls (Trolldal and Ponicki 2005), and the effect of price on youth alcohol consumption decreased following an increase in the minimum legal drinking age to 21 years (Laixuthai and Chaloupka 1993).

Elasticity estimates for a particular population vary over time, with alcohol becoming less price elastic in recent years (Fogarty 2006; Mazzocchi 2006; Gallet 2007). This trend probably reflects increasing affluence as alcohol becomes more affordable

Table 7.1 The price elasticity of demand by beverage type, and the number and publication range of studies included in eight meta-analyses

Meta-analysis report	Number of studies	Years studies published	Parameter	Total alcohol	Beer	Wine	Spirits
Fogarty (2006)	64	1945–1993	Mean	NA	−0.38	−0.77	−0.70
			Median	NA	−0.28	−0.76	-0.59
Gallet (2007)	132	1942–2002	Median	−0.50	−0.36	−0.70	−0.68
Wagenaar *et al.* (2009b)	112	1972–2007	Mean	−0.51	−0.46	−0.69	−0.80
Elder *et al.* (2010)	72	1972–2005	Median	−0.77	−0.50	−0.64	−0.79
Fogarty (2010)	141	1948–2006	Mean	NA	−0.44	−0.65	−0.73
			Median	NA	−0.33	−0.55	−0.76
Collis *et al.* (2010)	33	1949–2005	Mean	NA	−0.56	−0.90	−0.75
			Median	NA	−0.40	−0.86	−0.72
Sornpaisarn *et al.* (2013)	10	1988–2010	Mean	−0.64	−0.50	−0.79	
Nelson (2013a)	182	1958–2012	Mean	−0.50	−0.30	−0.45	−0.55
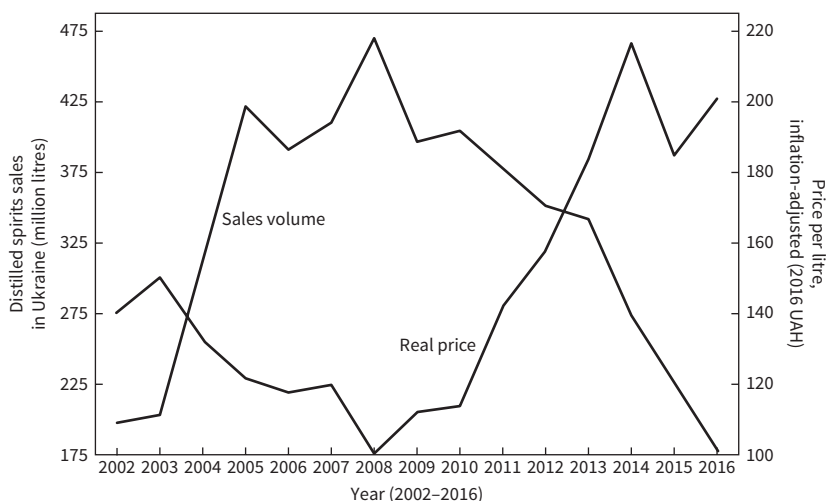
Figure 7.1 Distilled spirits sales and prices in Ukraine, 2002–2016, adjusted for inflation. Data from Euromonitor, World Bank, and Chaloupka *et al.*'s calculations. UAH, Ukrainian hryvnia.

(Blecher *et al.* 2018). Elasticity may also be lower when per capita alcohol consumption is high or when a beverage type becomes more popular (Babor *et al.* 2010, pp. 112–15).

7.5.2 Price elasticities for particular groups of drinkers

In econometric studies based on time-series data, the price elasticity values reflect the overall reactions in sales to price changes. In alcohol policymaking, the concern for particularly high-risk groups, including young people and heavy drinkers, implies a need to know how price changes will affect consumption in these particular groups. A meta-analysis (Gallet 2007) found that the median price elasticity for young adult drinking was slightly less (−0.39) than that for adult consumption (−0.56). The effects of price changes for young people are also reflected in harm rates. Price increases lead to reduced rates of suicide, traffic injuries, and sexually transmitted diseases among young people (Elder *et al.* 2010; Wagenaar *et al.* 2010).

 Adult drinkers are also responsive to changes in alcohol prices, and thus a price increase leads to reduced consumption among heavy drinkers and a reduction in **heavy episodic drinking**. This is demonstrated in numerous studies (Brennan *et al.* 2008; Wagenaar *et al.* 2009b; Elder *et al.* 2010; Jiang *et al.*,2016; Sharma *et al.* 2017). As an elasticity coefficient, the change may appear to be lower among heavier than light drinkers. Although a change from five to three drinks a day is proportionally less than a change from two to one drink a day, the heavier drinkers' change is larger in absolute

terms and matters more in terms of the risk of harm. Indeed, the effect of price on consumption among heavy drinkers is also apparent from studies showing a reduction in alcohol-related mortality in response to price increases (Wagenaar *et al.* 2010; Xu and Chaloupka 2011).

One review of the relationship between price or tax indicators and heavy episodic drinking (Nelson 2015) deviates from this overall picture by reporting that in more than half of the studies, there was no association or mixed results were found. The review included studies employing survey measures of the association between self-reported binge drinking and any available price- or tax-related variable, and utilized a 'vote counting' method of data synthesis (see also Box 6.3, Chapter 6) which does not take into consideration the quality of the studies, the size of the samples, or the size of the effects (Xuan *et al.* 2016). Nelson's argument is that many studies were not statistically significant with respect to the impact of taxation increases on drinking. Unfortunately, he did not use meta-analysis, the most appropriate method for testing the consistency of results where single relationships are not significant.

7.5.3 Differential prices by beverage and substitution

In many countries, taxation systems incorporate varying tax rates for different beverage categories (Österberg 2011). Usually, this entails higher tax rates per litre of alcohol for distilled spirits than for wine or beer, reflecting particular concerns relating to spirits consumption and offsetting the lower production and distribution costs per centilitre of ethyl alcohol for distilled spirits. In a similar vein, substitution of low-alcohol beverages for higher-alcohol alternatives is encouraged via tax concessions. For instance, in Australia and Sweden, no alcohol tax is charged on beer containing a very low alcohol by per cent of volume (Olsson *et al.* 2002; Econtech 2004).

Alcohol consumption substitutions can occur between and within beverage categories (Gruenewald and Remer 2006). In California, Treno *et al.* (1993) showed that even among the ten most popular products in each beverage category, prices varied by a factor of 60. Furthermore, prices paid for on-premises consumption (e.g. at a restaurant or bar) are significantly higher than those paid for alcohol purchased in off-premises outlets (Donnar and Jakee 2004; Gruenewald and Remer 2006). In many countries, this price disparity has resulted in '**pre-loading**' (sometimes also called pre-drinking or prinking) among young people, with substantial drinking before attending venues such as bars or clubs (e.g. Wells *et al.* 2009). Minimum unit price provisions generally reduce the price gap between on- and off-premises alcohol.

Differential taxation of beverage categories makes cross-beverage substitution an important issue. If taxes are raised on a particular beverage category, do drinkers simply transfer their drinking to a different beverage, or is an actual reduction in consumption achieved? There have been no systematic reviews of cross-price elasticities between alcoholic beverage categories, and most studies have focused on gradual price changes over time or price changes in different regions. Selvanathan and Selvanathan (2005b) examined cross-price elasticities in ten developed countries over more than 30 years, finding small, but statistically significant cross-price elasticities, suggesting that consumers do shift their consumption between beverages when prices change,

but that substitution is not complete. This finding has been supported in a number of other econometric studies (Okello 2001; Osoro *et al.* 2001; Özgüven 2004; Ramful and Zhao 2008), although some studies found no evidence of a substitution effect (e.g. Huang 2003; Mangeloja and Pehkonen 2009). Moreover, large increases in spirits taxes in Denmark in 1917 and in Switzerland in 1999 resulted in some substitution to other beverages; however, this accounted for only a fraction of the former consumption (Heeb *et al.* 2003; Skog and Melberg 2006). In short, no study has found complete substitution between beverage types following price changes, although tax-induced changes in relative price have some influence on consumers' choices for particular types of alcoholic beverage.

In response to the growing concerns about the **harmful use** of **alcopops**, also known as premixed spirits, ready-to-drink (RTD) spirits, or designer drinks, some countries have increased taxes on these products to reduce risky drinking by young people. In Australia and Switzerland, such taxation has led to substantial reductions in alcopops sales (Niederer *et al.* 2008; Chikritzhs *et al.* 2009), but also partial cross-beverage substitutions by other alcoholic beverage types (Niederer *et al.* 2008; Doren *et al.* 2011). Mixed findings are reported from studies evaluating the impact of the alcopops tax in Australia on alcohol-related harms. Some studies found no (Kisely *et al.* 2011, 2016) or small effects (Lensvelt *et al.* 2016), and one study (Gale *et al.* 2015) found the expected inverse relationship between tax changes and emergency department presentations for acute alcohol problems among young people. While the examples mainly dealt with a specific category of RTDs—sugared alcoholic beverages often used for initiation to drinking—differential taxation for RTDs may affect other groups of drinkers with similar preferences.

7.5.4 Alcohol prices and problems related to alcohol use

Whereas alcohol sales data are not routinely available for subgroups of the population, measures of alcohol-related problems are often more specific. These include statistics on morbidity and mortality focusing on alcohol-related liver disease, traffic accidents, violence, and suicide. Thus, one way to study the effects of price policy on some population subgroups, including heavy drinkers, is to examine problem rates related to alcohol use. One benefit of this approach is that it takes into account the possible substitution of recorded alcohol for **unrecorded alcohol** (see Chapter 3).

The strong and consistent evidence of the effects of prices on alcohol consumption is further evident from the literature demonstrating a negative association between prices and harm rates for conditions typically associated with alcohol consumption; when prices go up, harm rates go down, and vice versa. This is shown for violence, traffic injuries, suicide, sexually transmitted diseases, robberies, and other crimes, as reported in two systematic reviews and meta-analyses (Elder *et al.* 2010; Wagenaar *et al.* 2010) and a subsequent review (Xu and Chaloupka 2011). More recent studies add to this picture. An alcohol tax increase in Illinois in 2009 led to a substantial reduction in alcohol-related motor vehicle crash fatalities (Wagenaar *et al.* 2015). In

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Box 7.1 Alcohol taxation, all-cause mortality, and life expectancy

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Alcohol taxation can have marked effects on mortality or other indicators of health (Wagenaar *et al.* 2010). However, up to now, there has been no evidence that alcohol taxation can impact rates of all-cause mortality of the whole population of a country. The natural experiment of Lithuania with the implementation of a number of staggered alcohol control policies (Rehm *et al.* 2019b) allowed the study of such an effect, specifically for the taxation change on 1 March 2017. This change entailed an increase in excise taxes of over 100% for wine, beer, and intermediate products, and of 23% for ethyl alcohol, bringing it more or less in line with average taxation rates in the European Union (European Commission Directorate General Taxation and Customs Union 2020).

The effect of this policy on all-cause mortality was estimated in interrupted time-series analysis, against a background of overall decreasing all-cause mortality rate (Štelemėkas *et al.* 2021). It was estimated that the taxation change resulted in a reduction of 11.1 deaths for 100,000, which translates into 1452 deaths avoided (95% confidence intervals −166 to −2,739) in the year following implementation of the policy. Overall, this evaluation showed that well-designed alcohol taxation increases can have an immediate and lasting impact on all-cause mortality, and thus on life expectancy.

Lithuania, the implementation of increased taxation in 2017 was associated with reduced adult all-cause mortality (Štelemėkas *et al.* 2021) (see Box 7.1). These studies suggest that raising the price of alcoholic beverages is likely to result in a reduction in harm often caused by alcohol consumption.

Cost-effectiveness analysis, an economic tool used to examine the costs and health gains of alternative interventions, has found that alcohol taxation and pricing policies are not only effective alcohol control measures, but also highly cost-effective, compared to other alcohol control interventions (Anderson *et al.* 2009; Chisholm *et al.* 2018). For particularly vulnerable population groups, such as young people and heavy drinkers, tax increases can also reduce harm rates. There is good evidence that for young people, a price increase leads to reduced rates of suicide, traffic injuries, and sexually transmitted diseases, with the opposite effect with a price decrease (Elder *et al.* 2010; Wagenaar *et al.* 2010). Alcohol harms that are typically attributable to long-term heavy drinking are also found to change in response to tax changes. Thus, the tax increases in Denmark in 1917 and in Alaska in 1993 and 2002 led to substantial decreases in alcohol-related mortality rates (Skog and Melberg 2006; Wagenaar *et al.* 2009a), and the tax decrease in Finland in 2004 led to a substantial increase in alcohol-related mortality (Koski *et al.* 2007), particularly in lower socio-economic groups (Herttua *et al.* 2008). More generally, the impact of price changes on alcohol-related mortality is demonstrated in systematic reviews (Brennan *et al.* 2008; Wagenaar *et al.* 2009b; Elder *et al.* 2010) and other studies (Jiang *et al.* 2016; Sharma *et al.* 2017), thus offering further evidence that the effects of pricing policies on consumption also influence the heaviest drinkers in society.

7.5.5 Unrecorded alcohol consumption

In many parts of the world, there are substantial price differences between recorded and unrecorded alcohol, and particularly in LMICs, unrecorded consumption constitutes a substantial part of total consumption (see Chapter 3). The most significant downside to raising alcohol taxes is the possibility of substitution to untaxed alcoholic beverages, particularly via illegal smuggling or illegal in-country alcohol production, which is more likely when there are existing capabilities for tax avoidance. Studies from Africa reported that increases in market beer prices produced substantial increases in the consumption of local beer, and in Zimbabwe, an increase in alcohol taxes was quickly rescinded following a net drop in taxation revenue due to cheap and readily available illegal alcohol products (Jernigan 1999). However, in Russia, a tax increase in 2010–2012 was followed by a reduction in consumption of both recorded legal vodka and unrecorded spirits ('samogon') (Radaev 2015). Recent history with tax increases in North Eastern Europe has shown that unrecorded consumption does not necessarily result from taxation increases, but the potential for increases in unrecorded consumption should be counteracted in the implementation of such increases (Lachenmeier *et al.* 2021).

There is some evidence suggesting that the prices of unrecorded alcohol follow those of recorded alcohol over time. For instance, in Thailand, the average prices of unrecorded alcohol products remained about half the average prices of recorded products over an 18-year period with several tax increases (Laichuthai *et al.* 2001; Thaikla and Ratchusarnti 2015). This suggests that the price strategy for vendors of illegal alcohol products was to set their price between the pre- and post-tax prices of legal alcohol products, so that the consumers paid less and the producers earned more for the illegal product.

There are examples that tax changes in one country can influence cross-border purchases of alcohol when it is relatively convenient (Smith 2005). In Denmark, the tax reduction by 45% on spirits in 2003 reduced spirits sales in Sweden by around 2% (Asplund *et al.* 2007). Correspondingly, the taxation increases in Estonia and Lithuania led to higher cross-border purchases, particularly from Latvia (Neufeld *et al.* 2021).

Unrecorded consumption thus needs to be considered in tax decisions if there is already an established market for unrecorded alcohol in a country (Anderson *et al.* 2009). The example of Russia showed that marked increases in the price of alcoholic beverages do not necessarily need to be accompanied by increases in unrecorded consumption if other measures are taken in parallel (Neufeld *et al.* 2020, 2021). Policy options for handling unrecorded alcohol consumption are discussed in recent publications (Neufeld and Rehm 2018; Lachenmeier *et al.* 2021). It may also be argued, as Chaloupka *et al.* (2019) did concerning tobacco, that tax increases produce revenue and health benefits even in the presence of illicit products, albeit with smaller benefits than with full compliance with sales and tax laws.

7.5.6 Alcohol taxation and drinking initiation

Alcohol taxation and pricing measures that reduce consumption have short-, as well as longer-, term preventive effects, whereas policies that prevent drinking initiation are primarily long-term prevention policies (Sornpaisarn *et al.* 2012; Sornpaisarn *et al.* 2015b). Even though the prevalence of lifetime abstainers is high in LMICs (see Chapter 3), scholars have paid little attention to possible effects of alcohol taxation or other pricing policies on preventing drinking initiation (Sornpaisarn *et al.* 2013). Studies from Thailand (Sornpaisarn *et al.* 2015b) and Chile (Paraje *et al.* 2020) both found that tax or price increases were associated with delayed drinking initiation.

7.6 Effectiveness of minimum unit pricing

Habitual and heavy drinkers tend to drink the cheapest alcoholic beverages (e.g. Callinan *et al.* 2015). The minimum unit pricing (MUP) for alcohol has recently received attention as an economic policy that could target heavy drinkers without imposing an added expense on moderate or light drinkers from increased taxation. In 2012, the Scottish Parliament unanimously passed legislation to introduce an MUP; however, implementation was delayed until 2018 because of challenges from the alcohol industry (Sharma *et al.* 2016). The MUP in Scotland resulted in a 7.9% increase in average price (O'Donnell *et al.* 2019). However, additional analyses with the same methodology indicated that it was women, rather than the heaviest drinkers, who reduced their level of drinking (Rehm *et al.*, in press).

Studies from Canadian provinces and Scotland (see Box 7.2 and Figure 7.2) showed that increasing or introducing minimum prices can significantly reduce alcohol consumption and alcohol-related deaths and hospital admissions (Stockwell *et al.* 2011, 2012, 2013, 2015; Zhao *et al.* 2013; O'Donnell *et al.* 2019). In Canada, these effects were more significant for off-premises sales than on-premises sales, and for higher-strength beers (>6.5% alcohol by volume) than lower-strength beers (Stockwell *et al.* 2012).

Several modelling studies have supported the idea that MUP could reduce alcohol consumption by heavy drinkers and subsequently reduce the ensuing harms in England (Brennan *et al.* 2008, 2014; Holmes *et al.* 2014; Sheron *et al.* 2014; Meier *et al.* 2016) and Australia (Sharma *et al.* 2014; Vandenberg *et al.* 2016). For instance, MUP could be used to reduce off-premises alcohol drinking among adolescents (**pre-drinking**) before they go to drink at on-premises venues. Based on an analysis of practical experiences in applying the MUP in Canadian provinces, Thompson *et al.* (2017) suggested the following recommendations for the implementation of MUP: (1) set minimum prices for the sale of alcohol in both on- and off-premises establishments for all beverage categories; (2) carefully choose the level of MUP to affect the targeted alcohol products; (3) base the calculation of MUP on litre volumes of ethanol for each beverage type; and (4) ensure prices are adjusted for inflation at least annually.

Box 7.2 Canadian and Scottish experiences in employing the minimum unit pricing for alcohol

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Canada has applied the minimum unit pricing (MUP) for alcoholic beverages at the provincial level since the 1990s, and Scotland commenced its MUP in 2018. There are large variations across Canada in the way each province sets minimum prices in terms of the MUP rates imposed, the differences by types of beverages, whether or not the MUP is indexed to the cost of living, and whether it applies for both on- and off-premises sales (Stockwell 2014), whereas in Scotland, there is a simple price per unit and nothing can be sold below that price (O'Donnell *et al.* 2019).

Canada: British Columbia

The government of British Columbia has adjusted the minimum prices for alcohol products intermittently from 1989 to 2010. An evaluation by Stockwell *et al.* (2011) estimated that a 10% increase in MUP of alcohol reduced consumption by 6.8% for spirits and liqueurs, 8.9% for wine, 13.9% for alcoholic sodas and ciders, 1.5% for beer, and 3.4% for total alcoholic drinks. Furthermore, it was found that the periodic increases in minimum alcohol prices during 2002–2009 were associated with reduced alcohol-attributable hospitalizations (Stockwell *et al.* 2013), wholly (100%) alcohol-attributable deaths (i.e. alcoholic psychosis and alcohol dependence), and delayed reductions (2–3 years later) in acute and chronic alcohol-attributable deaths (Zhao *et al.* 2013), as well as reductions in alcohol-related traffic violations and crimes (Stockwell *et al.* 2015).

Canada: Saskatchewan

The Saskatchewan Liquor and Gaming Authority (SLGA) introduced new minimum prices for liqueurs, cocktails, and coolers, and increased minimum prices for spirits, wine, and beer in April 2010. An evaluation found that a 10% increase in minimum prices significantly reduced consumption of beer by 10.1%, spirits by 5.9%, wine by 4.6%, and all beverages combined by 8.4%. These effects were more significant for off-premises sales than on-premises sales, and for higher-strength beers (>6.5% alcohol by volume) than lower-strength beers (22.0% and 8.2% reduction in consumption, respectively) (Stockwell *et al.* 2012).

Scotland

The introduction of MUP of 50p per UK unit (6.25p per gram of alcohol) in Scotland in 2018 was followed by an increase in purchase price of 0.64p per gram of alcohol (a 7.9% increase), and a reduction in weekly purchases of 9.5 grams of alcohol per adult per household (a 7.6% decrease) (see Figure 7.2). The increase in the purchase price paid was higher in lower-income households and in households that purchased the largest amount of alcohol.
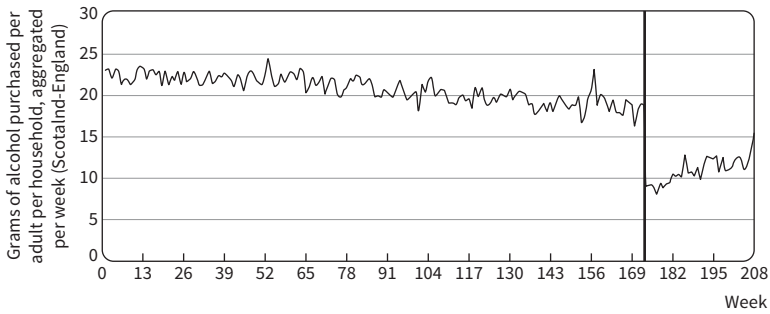
Figure 7.2 Plot of difference between Scotland and England in grams of alcohol purchased per adult per household aggregated by week (1 = first week of 2015; 208 = last week of 2018). Vertical line = introduction of minimum unit price, week 174.

Reproduced with permission from O'Donnell A, Anderson P, Jané-Llopis E, *et al.* (2019) Immediate impact of minimum unit pricing on alcohol purchases in Scotland: controlled interrupted time series analysis for 2015–18. *bmj*, 366, l5274. doi: 10.1136/bmj.l5274

A concern regarding MUP is that the added revenue goes to the sellers, unlike tax revenues that go to the government (Sornpaisarn *et al.* 2017). To address this concern, excise taxation could serve the same purpose as MUP by increasing prices of cheap alcohol products, with the difference between the MUP price and the producer price going to the government as tax revenue.

7.7 Effectiveness of policies forbidding below-cost sales and restricting sales promotion

The discounting of alcoholic beverages occurs in a number of ways. In on-premises settings, alcohol discounting usually takes the form of 'happy hours', which are periods of time in which alcohol is sold at lower than normal prices. There is consistent evidence that these promotions increase alcohol consumption and alcohol-related harms (Puac-Polanco *et al.* 2020). While a number of jurisdictions have restricted or banned happy-hour promotions, there has been little well-designed research into the effects of these restrictions, and the findings of the only study that evaluated a particular law are inconclusive (Smart and Adlaf 1986; Puac-Polanco *et al.* 2020).

In off-premises settings, particularly when sold in chain grocery stores, alcohol is often heavily discounted to encourage customers to enter the store, acting as a loss leader. In the United Kingdom, this practice has been widespread, with grocery stores regularly selling alcohol at below-cost prices (Scottish Health Action on Alcohol Problems 2007). It has been estimated that a total ban on off-trade discounting would reduce consumption by 2.8% in England (Brennan *el al.* 2008). However, further modelling suggested there was less impact of a ban on below-cost selling than there would be from implementing an MUP (Brennan *et al.* 2014).

7.8 Special issues concerning economic policy interventions

7.8.1 Income, affordability, inflation, and alcohol consumption

Affordability, a result of an individual's income relative to alcohol prices, could predict the level of alcohol consumption even better than the alcohol price alone (Wall and Casswell 2013). This chapter has reviewed the strong evidence of the effectiveness of taxation and pricing policies, a part of affordability, in reducing alcohol consumption and its related harms. Economic theory and empirical studies suggest that income, the other part of affordability, will also impact alcohol consumption because consumption tends to increase with income (Gallet 2007; Fogarty 2010; Nelson 2013a). The importance of affordability for public health is illustrated in a study from Belarus, which found that each 1% increase in vodka affordability (combining both price and income changes) was related to a 0.3% increase in the prevalence of alcohol dependence and in the number of patients receiving treatment for alcohol dependence (Razvodovsky 2013).

At the national level, aggregate alcohol consumption is generally pro-cyclical; drinking rises when the economy booms and declines during economic recessions (Ruhm and Black 2002; Krüger and Svensson 2010). However, problematic drinking may be counter-cyclical (Dee 2001; Johansson *et al.* 2006). One study (Selvanathan and Selvanathan 2005a) found that the income elasticity of alcohol was substantially higher in LMICs than in HICs, suggesting that prices are most effective at reducing consumption when aggregate income is low.

In many countries, real prices for alcoholic beverages have declined substantially since 1950 (e.g. Xu and Chaloupka 2011; Blanchette *et al.* 2020). For example, in the United States, both insufficient and infrequent tax increases led to substantial declines in the real value of alcohol taxes between 1970 and 2018 (Blanchette *et al.* 2020). A similar trend was observed for Europe between 1996 and 2004 (Rabinovich *et al.* 2009). A major cause of this decline is that inflation automatically reduces the real tax value, resulting in greater alcohol affordability. One way to prevent the erosion of the beneficial effects of tax measures is to link alcohol tax rates to a cost-of-living index, rather than setting them at a fixed value. This is now the case in Australia where alcohol excise duty rates are adjusted every 6 months, in line with the Consumer Price Index (Australian Tax Office 2006). Several former Soviet Union countries have inflation-adjusted taxes for all or some types of alcoholic beverages (Neufeld *et al.* 2021).

7.8.2 The regression issue: alcohol tax/minimum unit price and the poor

Economists describe a tax that has greater effects on the poor than the rich as 'regressive'. From a public health perspective, however, such a differential effect would decrease health inequality, since a given level of drinking has greater effects on the health of poorer than richer drinkers (see Chapter 4). The evidence generally supports the proposition that alcohol taxes are regressive, that is, they have a greater fiscal impact on

the poorer than on richer drinkers. But studies from New Zealand (Ashton *et al.* 1989), African countries (Younger 1993; Younger and Sahn 1999), Russia (Decoster 2005), and Australia (Vandenberg and Sharma 2016) found little evidence of regressive effects of alcohol taxes on the whole population. Abstention from alcohol is more common among the poor, compensating for the greater effect on heavy drinkers who are poor.

Studies from Finland found no systematic difference across income groups in the effect of a tax reduction on alcohol consumption (Mäkelä and Österberg 2009), but substantially greater increases in alcohol-related mortality among less privileged people (Herttua *et al.* 2008). Correspondingly, modelling studies also suggest that a tax increase may reduce social inequality in health by reducing alcohol-related harm to a greater extent among economically disadvantaged people (Brennan *et al.* 2014; Meier *et al.* 2016).

7.8.3 Tax avoidance and evasion

Alcohol business operators and consumers often try to bypass some of the government-imposed tax burden whenever possible (Sornpaisarn *et al.* 2017). Tax avoidance is legal in certain situations, as when consumers purchase alcohol products from duty-free shops or breweries produce the least-taxed beers. Tax evasion, on the other hand, involves illegal activities aimed at escaping tax payments. For example, alcohol producers or importers may falsely describe the product or under-invoice its price in order to reduce the tax on their product. Tax evasion also includes smuggling and illicit production.

Tax avoidance and tax evasion can reduce tax revenue and undermine the health benefit of increased alcohol taxation. Strategies available to governments to handle tax avoidance and evasion include having an effective licence and tax system for alcohol products and investing in a sound enforcement system for production, importation, distribution, and sale (see details in Sornpaisarn *et al.* 2017). These are similar to strategies used to curtail illicit trade of tobacco: strengthened tax administration, enhanced enforcement, and strong penalties (Chaloupka *et al.* 2019).

7.8.4 Issues concerning tax method selection

There are significant variations in taxation methods used by governments, as reported in the 2012 Global Survey on Alcohol and Health (Rehm and Shield 2017). Among the countries that responded to the survey, 46 used an ad valorem taxation system, 24 used a specific taxation system, five used a unitary taxation system, and 63 used a combination of taxation systems (Rehm and Shield 2017). Ad valorem taxation is based on the value of the alcohol in terms of wholesale or retail price. Specific taxation is based on the ethanol content, and unitary taxation is based on the volume of the beverage, whatever its alcohol concentration. Examples of complex tax systems include ad valorem taxation for wine and specific taxation for all other alcoholic beverages, and both specific taxation and ad valorem taxation for each alcohol product. Ad valorem taxation alone is normally used for tax revenue generation purposes but

is not appropriate for taxing externality-generating products such as alcohol and to-bacco (Keen 1998; Cnossen 2005). Unitary taxation is commonly applied for wine in some countries, often justified because of the difficulty in producing a precise alcohol content by volume (Richupan 2005; New Zealand Law Commission 2010). In wine-producing countries, it also gives cheap wines an advantage in the cheap high-volume end of the alcoholic beverage market. Alcohol companies are usually able to adjust their products to reduce the tax burden corresponding to the tax methods the government employs (Smith 2005; Malcolm 2011) (see details for attributions of various tax methods also in Sornpaisarn *et al.* 2015a, 2017).

Taxation methods based on ethanol content (specific taxation), rather than on price or beverage volume, are usually the most appropriate options for imposing taxes on alcohol products from the perspective of public health benefits (Sornpaisarn *et al.* 2017; Rehm *et al.* 2019a). Specific taxation can reduce total consumption by setting a higher rate for stronger beverages such as spirits. This may also reduce the rate of alcohol poisoning and violence, which have been linked to consumption of spirits and rapid ingestion of large amounts of alcohol (Mäkelä *et al.* 2007; Rehm and Hasan 2020). Another way would be to keep specific taxation based on ethanol content, but with beverage types favouring the products with lower alcohol content (Rehm *et al.* 2016).

Studies of these specific taxation approaches indicate successes in both HICs and LMICs. For instance, in response to specific taxes closely related to alcohol content in Sweden, drinkers shifted from spirits to lower-content alcoholic beverages, resulting in a reduction in total alcohol consumption (Keen 1998). In Thailand, a combination of specific taxation and ad valorem tax led to both reduced consumption of taxed alcohol products and delayed drinking initiation among young people (Sornpaisarn *et al.* 2012, 2016). The specific taxation increased the ethanol price, while the ad valorem tax made costly Western-style beverages preferred by youth more expensive (Sornpaisarn *et al.* 2012, 2015b, 2017). Finally, the Russian Federation used taxation increases based mostly on alcohol content, but with heavier taxation of spirits to shift the overall level of consumption downwards, in addition to shifting beverage preferences from spirits to beer (Korotayev *et al.* 2018; Neufeld *et al.* 2020).

7.8.5 Alcohol pricing policies, the economy, and jobs

A common argument against policies increasing the price is their assumed effects on the economy and employment in the alcohol industry. Anderson and Baumberg (2017) have argued that if people spend less money on alcohol, they will spend more money on other goods, which will create jobs elsewhere in the economy. Therefore, the costs that should be considered are only the adjustment costs in the medium and short term (i.e. over a few years). The costs to society from alcohol use (e.g. with regard to health care, policing, courts, prisons, productivity loss, unemployment, and premature mortality) should also be taken into account. Public health-oriented alcohol policies are likely to decrease costs in these areas. These reductions in cost are estimated to far outweigh any potential economic disadvantages of alcohol pricing policies.

7.8.6 Tax for health or hypothecated taxes

In some settings, a proportion of excise taxes from alcohol products (and other products such as tobacco) is explicitly allocated to fund health services (Javadinasab *et al.* 2019) and health promotion activities, and to control problems caused by **harmful alcohol use** (Pongutta *et al.* 2019). This can be implemented via non-legislative budgeting by the government (called 'dedicated tax') or by legislation (called 'earmarked tax' or 'hypothecated tax'). Funds can either be allocated from an existing excise tax (earmarked), via an additional charge on top of the existing excise tax ('surcharged tax') (Sornpaisarn *et al.* 2017), or, as in Sweden, be as an allocation from government alcohol monopoly profits. An increasing number of countries have adopted this financial mechanism following its establishment in New Zealand for alcohol in 1976 (Casswell 1985). See Box 7.3 for a brief description of how this fund was established in Thailand. Governments may consider this financial strategy to obtain a sustainable funding mechanism to control problems caused by alcohol consumption. Furthermore, hypothecated taxes globally could support intergovernmental and collaborative efforts to prevent alcohol harms worldwide, beyond the alcohol control policies in single countries.

Box 7.3 Establishment of the Thai Health Promotion Foundation using a surcharged tax from alcohol and tobacco excise taxes

Thai Health Promotion Foundation (Thai Health) is an autonomous governmental organization in Thailand (Pongutta *et al.* 2019). It was established when Thailand's parliament enacted the Thai Health Promotion Foundation Act (B.E.2544) in 2001. Thai Health is not part of the Ministry of Public Health but is under the supervision of the Prime Minister directly. The Foundation's budget comes from a 2% surcharge levied on excise tax from alcohol and tobacco producers. On average, its annual revenue is US$120 million. This type of funding mechanism is the most effective means of securing sustainable and long-term funding support for health promotion activities in the country.

Using its budget, Thai Health is a catalyst for the coordination and empowerment of partner organizations to promote the health of the Thai people (Pongutta *et al.* 2019). Thai Health and its alliances employ health advocacy strategies, mass media campaigns, and community mobilization. The success of the alcohol policy advocacy strategy is illustrated by the number of national alcohol policies in Thailand, which increased from six policies in the half-century between 1950 and 2001 to two policies per year from 2003 to 2008. The 'collective impact' of Thai Health and its alliances includes a reduction in the annual per capita alcohol consumption, which decreased from 8.1 litres pure alcohol in 2005 to 6.9 litres in 2014.

7.9 Summary and conclusions: the impact of tax and pricing policies

This chapter has evaluated the role of alcohol prices and taxes as a means to curb total alcohol consumption and alcohol-related problems. Hundreds of studies, conducted mostly in HICs, but also in several LMICs, have demonstrated that alcohol prices have an effect on alcohol consumption and related problems, including mortality rates, crime, and traffic accidents.

As described in more detail in ⊜ Online Appendix 1 and Chapter 6, the strategies and interventions reviewed in this chapter were rated by the authors in two major areas: evidence of effectiveness and amount of research support. Table 7.2 provides the authors' consensus ratings of the policy options reviewed in this chapter. These evaluations also considered other issues such as population reach and relative cost of the intervention to governments in terms of time, resources, and money. These are summarized in the comments section of the table.

Table 7.2 shows that there is strong evidence of effectiveness and a wide breadth of research support for alcohol taxation in reducing alcohol consumption and related problems. The effect applies to all groups of drinkers, including heavy drinkers and adolescents. Furthermore, the cost of implementing alcohol taxation is low. There is some evidence of a moderate effect of MUP on consuming cheap alcoholic beverages and its related harm. This price control measure particularly affects heavy drinkers and the poor, who usually prefer cheap alcohol. There has been moderate evidence showing that additional taxation on alcopops and youth-oriented beverages reduces consumption of these taxed beverages. However, there is uncertainty about its ability to mitigate harms because adolescents can substitute beverages that are taxed at a lower rate and are therefore more affordable. There is little evidence demonstrating the effectiveness of bans on price discounts and promotions, and of differential pricing by beverage.

Apart from tax rates, some governments have used other means to influence price, such as establishing minimum sale prices or restricting discounted sales, in order to reduce rates of alcohol problems. Evidence supports the proposition that raising the minimum price of the cheapest beverages is especially effective in influencing heavy drinkers, and in reducing rates of harm. There is little evidence that bans on sale below cost and restrictions on sales promotion have any impact on consumption or harms at the aggregate level; however, there have been few studies of this issue.

Box 7.4 provides guidance for designing and implementing alcohol taxation policies, based on the evidence reviewed in this chapter. Alcohol taxes are thus an attractive instrument of alcohol policy, as they can be used both to generate direct revenue for the government and to reduce alcohol-related harms. Beyond their revenue potential, they are among the most cost-effective ways for a government to reduce alcohol-related harm in both HICs and LMICs. The specific tax method (taxing on ethanol content) is good for controlling alcohol consumption. While restrictive taxation and pricing policies are unlikely to hinder economic development, given some time for adjustment, the most crucial downside to raising alcohol taxes is the possibility of substitution to untaxed alcoholic beverages, particularly via illegal smuggling or illegal

Table 7.2 Consensus ratings of policy-relevant pricing and taxation strategies and interventions[c]

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Alcohol taxes	+++	+++	Increased taxes reduce alcohol consumption and harm for the whole society, including heavy drinkers and adolescents. Some evidence of benefit from delaying drinking initiation among adolescents. Effects depend on initial tax, size of increase, government oversight, control of total alcohol supply, disposable income, and effect of increased taxes on affordability of alcohol, which can be enhanced by indexing tax rates to the cost of living. Wide population reach, but high taxes may increase unrecorded consumption
Minimum price policies, which include minimum unit price (MUP) as the prime example	+/++	++	Evidence of effectiveness from countries applying MUP is relatively recent. Newly imposed and increased MUPs can reduce alcohol consumption and harm but not in all cases. Since on-premises drink prices include the costs of service, MUP primarily affects cheap alcohol sold for off-premises drinking, which is preferred by heavy drinkers and the poor. Revenue from the increased price of cheap alcohol does not accrue to government, and will increase the profit margins of industry, unless sales are made through a state monopoly
Bans on price discounts and promotions	?	+	Numerous studies show that 'happy hour,' drink specials and price promotions are associated with increased drinking and intoxication, but almost nothing is known about the effects of laws restricting drink specials. Effectiveness may depend on enforcement of ban and whether there are alternative sales points or forms of cheap alcohol
Differential price per unit of alcohol by beverage	+	++	Higher prices for distilled spirits may shift consumption to lower alcohol content beverages, which may result in less overall consumption and reduce alcohol overdose. Evidence for the impact of tax breaks on low alcohol products is suggestive, but few studies have been conducted
Special or additional taxation on youth-oriented beverages	+	++	Higher prices reduce consumption of youth-oriented beverages by young drinkers without causing substantial substitution

[a] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ Evidence of a strong effect on consumption or problems; ? One or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[b] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include LMICs; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in LMICs.

[c] For further information, please see 🗐 Online Appendix 1

Box 7.4 Recommendations for designing and implementing alcohol taxation policies

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1. Impose excise taxes on alcohol products to cover the costs of alcohol's negative externalities. To reduce harmful use of alcohol and its related harms, the government should increase taxes to make alcohol less affordable, especially for those who drink heavily.
2. Use the specific taxation option (taxing on ethanol content) to reduce total alcohol consumption. Employ the mixed method combining specific taxation (taxing on ethanol content) and ad valorem taxation (taxing on alcohol price) to simultaneously reduce total alcohol consumption and prevent drinking initiation. The latter approach is appropriate, especially for countries with a high prevalence of lifetime abstainers if abstention is seen as an important and healthy option to be encouraged in these countries.
3. Regularly increase tax rates for alcohol products or tie them to inflation to prevent real alcohol prices from falling and alcohol affordability from increasing over time.
4. Invest in law enforcement to reduce the illicit alcohol market.

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in-country alcohol productions. However, the net effects of tax and price increases tend to be a reduction in alcohol consumption and related problems.

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8
Regulating the physical availability of alcohol

8.1 Introduction

Research generally indicates that when alcohol is readily available, consumption and associated problems increase, whereas they decrease when restrictions are placed on availability (Fitterer *et al.* 2015). Controls on availability can be imposed at a population level (e.g. hours of sale) or at an individual level (e.g. restrictions by age or as directed by a court order).

Alcohol markets are generally regulated by the government, whether at the community, regional, and national level. Alcohol regulation is usually separate from, and more extensive than for, other commodities, reflecting health and welfare concerns specific to alcohol use. Beverage alcohol that is produced or distributed outside government regulation and oversight is described as **unrecorded alcohol**[1] or 'informal alcohol'. Informal alcohol constitutes about 25–30% of the world alcohol supply (Okaru *et al.* 2019) and is especially prevalent in some **low- and middle-income countries** (LMICs), accounting in some places for as much as 90% of total consumption (Room *et al.* 2002). Informal markets diminish the effectiveness of availability regulations. While there are several policy options to address informal markets (Okaru *et al.* 2019), research evidence on their effectiveness or cost-effectiveness is relatively sparse. Therefore, this chapter primarily addresses regulating the availability of recorded alcohol.

8.1.1 The overall system of alcohol control

There are three options for governance of the alcohol market: complete prohibition; government **alcohol monopoly**; and government licensing and regulation. Different options may coexist in the same jurisdiction for different types of alcoholic beverages and for **off-premises** sales vs **on-premises** purchase and drinking.

Outright prohibition received considerable attention worldwide between the 1830s and 1930s and still exists in some jurisdictions. Prohibition laws were passed in the early twentieth century in 13 self-governing countries (Schrad 2010), and were imposed by colonial and settler governments on many Indigenous peoples (e.g. Brady 2000), or later by Indigenous peoples themselves (Lee *et al.* 2018). National-level prohibitions were generally repealed by the 1930s, and other prohibitions mostly

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

disappeared by the 1960s. However, reflecting a much longer tradition with religious authority, prohibition remains in effect in a number of Muslim-majority countries (Al-Ansari *et al.* 2016).

A second approach to alcohol availability is governmental monopoly of the market. This not only provides a means of government income, but it can also be used as a means of controlling alcohol availability in the interests of public health and social order (Room and Cisneros Örnberg 2019). Though now less common, there continue to be government monopolies at some level (import, production, wholesale, or retail) in 50 countries (World Health Organization 2018). For example, off-premises retail monopolies operate in Norway, Sweden, Finland, and Iceland, as well as in Eastern Europe (e.g. Russia), southern Africa, Costa Rica, a number of Indian states, most Canadian provinces, and a number of US states.

A third system of governance of alcohol availability is through **licensing** to sell alcohol. In 2016, 141 of the 164 countries responding to a World Health Organization survey reported having such a licensing system (World Health Organization 2018). Such systems commonly include limitations on **hours and days of sale**, minimum drinking age limits, and civil penalties, including licence suspension for breaches of regulations. However, the extent and enforcement of alcohol market regulation varies greatly; in many LMICs, alcohol availability is effectively unregulated (Pinsky and Laranjeira 2007; World Health Organization 2018).

Alcoholic beverages are generally sold either for on-premises consumption (e.g. in a bar, café, or restaurant) or to take away for off-premises consumption (e.g. when purchased from a liquor store or a supermarket). In mature alcohol markets, both 'on-premise' and 'off-premise' sales, other than by a government monopoly, are typically regulated through a **licensing system** specifying who may sell alcohol, to whom alcohol may be sold (e.g. to minors or intoxicated customers), conditions of sale (e.g. purchase quotas or sales over the counter), and days or hours of trading. For on-premises sales, there are additional opportunities for regulation within the venue (see Chapter 10). Off-premises sales offer fewer opportunities to influence actual drinking behaviour; however, the type, strength, packaging, and price can be regulated, as well as the positioning in the store (e.g. not near the entrance or sales counter), the quantity of purchase allowed, and the number and types of outlets that are permitted to sell alcohol (e.g. whether the store sells only alcohol, whether sales are allowed in supermarkets or in petrol stations).

This chapter describes the effects of changes in alcohol availability on alcohol consumption and related problems. It covers changes in retail availability (when, where, and to whom alcohol is sold); in restrictions on who can purchase alcohol (e.g. by age); and in other factors that influence alcohol availability such as strength of different types of alcoholic beverages and types of alcohol containers, as well as self-service and social availability.

8.2 Changes in retail availability

8.2.1 Total or partial bans

Total prohibition of alcohol sales on a countrywide basis is currently limited to a few Islamic countries, but prohibition is more common in sub-national jurisdictions. For

example, among Indian states, Gujarat has had prohibition since 1947 and so have other states for shorter periods (Benegal 2005). Local prohibition persists in substantial parts of the land area of the United States, though mostly in less populated areas (National Alcoholic Beverages Control Association 2016). In Canada, Australia, and the United States, many Indigenous communities in rural and remote areas have implemented prohibitions on alcohol (Muhunthan *et al.* 2017).

Although prohibition is never completely effective in limiting alcohol availability, historical evaluations of the prohibition periods in North America and the Nordic countries (e.g. Blocker 2006) show that total bans on alcohol sales can reduce alcohol-related problems. Research in India indicates that overall alcohol consumption decreases substantially with total prohibition, and that prohibition of **arrack**, the local spirit, reduces its consumption by as much as 76% (Rahman 2003). But where there is a substantial demand for alcohol, it will be filled partly by illegal operators (Lee *et al.* 2018), and the market's illegality may carry its own adverse consequences—for example, while prohibition in the United States reduced alcohol consumption, homicide rates went up (Jensen 2000).

Prohibition is easier to enforce on islands and in other isolated areas where alcohol imports can be effectively controlled, and has often occurred in isolated communities that have particularly severe alcohol problems (and usually significant Indigenous populations) (Brady 2000). For example, with a ban on possession or importation of alcohol in the small Alaskan town of Barrow, the number of outpatient hospital visits for alcohol-related causes dropped significantly. When the ban was lifted, the rates of outpatient visits went back up but dropped again with the reintroduction of the prohibition (Chiu *et al.* 1997). Complete bans on alcohol in some remote Australian communities produced reductions in alcohol-related problems (Chikritzhs *et al.* 2007). Such restrictions in remote communities have often been implemented as part of a wide-ranging programme and seem to be most successful when implemented with full community support (Brady 2000; Muhunthan *et al.* 2017).

Although in most of the world, total prohibition is not usually a politically acceptable option, the impact of the coronavirus disease (COVID-19) pandemic has shown that it remains an option in some places. As described in Box 8.1, in 2020, South Africa implemented a comprehensive 4-month ban on the sale of alcohol to free up space in the health system to deal with the pandemic.

Partial bans, including limiting consumption by a system of **rationing**, have also been initiated in some places and circumstances, particularly in times of national emergency such as the two World Wars. Rationing can substantially reduce the drinking of heavier drinkers (Room and Livingston 2017). The Swedish motbok system implemented in 1916 combined a general rationing system with individualized controls for problematic drinkers. After its abolition in 1955, deaths from delirium tremens rose from 160 to more than 700 per year, and by 1980, male cirrhosis mortality had quadrupled (Bruun and Frånberg 1985, p. 331; Norström 1987). Other historical evidence from Greenland (Bruun and Frånberg 1985) and Poland (Moskalewicz and Świątkiewicz 2000) supports the effectiveness of rationing systems. However, though rationing reduces heavy consumption and problems, it is generally seen as an unacceptable infringement on individual choice.

Box 8.1 COVID-19 and alcohol bans in South Africa

Due to coronavirus disease (COVID-19) pandemic, South Africa had two periods in 2020, totalling 3 months, of comprehensive lockdown, restricted travel, closed schools and universities, and mandated social distancing. Residents could leave their homes only to access health care or purchase essential items, with alcohol defined as non-essential and alcohol sales banned. Disentangling the impact of the prohibition of sales from the other pandemic-related restrictions is challenging, but it is clear that South Africa saw substantial declines in alcohol-related harm during this period. An early evaluation identified a drop in unnatural deaths of over 50% and a major decline in presentations to a rural hospital for assaults, accidents, and injuries (Reuter *et al.* 2020) (see Figure 8.2 on page 147).

8.2.2 Alcohol monopolies

Retail alcohol monopolies can be an effective way to influence alcohol consumption. By removing the private profit motive for increasing sales, monopolies tend toward fewer outlets, shorter hours of sale, and less advertising and promotion than in privatized systems.

Evidence from Finland suggests that removing even a single beverage from government monopoly control can have dramatic impacts. In 1969, beer up to 4.7% alcohol could be sold by grocery stores, and it also became easier to obtain a restaurant licence to sell beer and wine. The number of off-premises outlets for such beverages increased from 130 to about 17,600, and on-premises outlets from 940 to over 4000. Overall consumption of alcohol increased by 46% from 1968 to 1969 (Mangeloja and Pehkonen 2009). In the following 5 years, mortality from liver cirrhosis increased by 50%, hospital admissions for alcoholic psychosis increased by 110% for men and 130% for women, and arrests for drunkenness increased by 80% for men and 160% for women (Poikolainen 1980). Modelling the potential impact of privatizing Sweden's alcohol monopoly, including the potential impact on pricing, outlet density, trading hours, advertising, and marketing, Stockwell *et al.* (2018) estimated that privatization could lead to increases in consumption of between 20% and 31% and in mortality of up to 80%.

Nevertheless, privatization does not always lead to greater alcohol consumption. After privatization of the liquor monopoly in Washington State in the United States, there was little net impact on alcohol consumption in either official statistics or surveys (Kerr *et al.* 2018; but see Barnett *et al.* 2020). This probably reflects the common North American political compromise on privatization of retail alcohol sales—that the government would not lose revenue (Her *et al.* 1999). This meant retail prices often rose with the addition of private profit and costs of extra stores and hours of operation in the privatized system, thereby countering the potential effect of increased physical availability (Horverak and Österberg 1992).

Monopolies' lack of a private profit motive may have broader effects. For instance, Rossow *et al.* (2008) found that monopoly stores in Finland and Norway were

one-third as likely as private stores to sell alcohol to under-age-appearing 18-year olds without checking identification (see Chapter 10 on enforcement).

8.2.3 Density of retail outlets

Restricting the number and location of alcohol outlets has been widely used to reduce alcohol-related problems by limiting consumption. Regulations of this type are often portrayed as anti-competitive, and in many jurisdictions have been weakened, with corresponding increases in outlet densities (Moskalewicz and Simpura 2000). Limiting licences raises the incentive for licensees to comply with restrictions on sales to the underaged or intoxicated by increasing the value of a licence, whereas increased competition with ready availability of licences increases the incentive to cut corners on restrictions.

Limiting the number of outlets can affect alcohol consumption by increasing the real cost of purchasing alcoholic beverages via the increased time or effort required to access it, and potentially by increasing the monetary cost due to reduced competition (Stockwell and Gruenewald 2004). Increasing densities of alcohol outlets (especially bars, pubs, and nightclubs) might influence harm rates via other mechanisms, such as opportunities for social interaction between potential victims and perpetrators or by concentrating particular types of drinkers within certain venues (Gruenewald 2007; Livingston *et al.* 2007). Density of outlets can refer not only to the number of outlets within a specified area, but also to the proximity of outlets to one another, and adding new licences may increase street violence among pub crowds in what becomes an 'entertainment district'. Studies which have found a relationship between outlet density and harm, even when alcohol sales have been controlled (e.g. Hobday *et al.* 2015), may be reflecting problems arising from patrons going between premises and other factors associated with a large number of premises in close proximity (see Chapter 10 on the drinking context). Importantly, the impact of changes in density are mediated by social, cultural, and market factors, so that changes in physical availability may not have uniform effects across settings or time periods (Holmes *et al.* 2014).

A **systematic review** applying stringent quality criteria found four **natural experiment** studies of major changes in retail alcohol outlet density that examined consumption outcomes (Sherk *et al.* 2018), with three finding that increases (or decreases) in availability led to increases (or decreases) in consumption. The broader evidence base, predominantly from highly regulated markets, supports the conclusions of this review, including studies finding increased harms (e.g. Room 2002).

Studies of partial privatization of retail sales in British Columbia, Canada found that the increase in outlet density via private liquor stores led to increased consumption (Stockwell *et al.* 2009), morbidity, and mortality (Stockwell *et al.* 2013). The dramatic expansion of outlet density in Washington State in the United States following privatization was followed by similar increases in violence, with clear spatial links to the new outlets (Tabb *et al.* 2016), despite mixed evidence of effects on consumption (Barnett *et al.* 2020). Major changes to Russian alcohol policy in the mid-2000s led to sharp reductions in availability via the introduction of licensing requirements and a

range of restrictions on where alcohol could be sold, leading to an estimated reduction of over 8000 deaths per year (Pridemore *et al.* 2014), although economic factors may also have played a role here (Nemtsov *et al.* 2019). Reductions in alcohol availability in Lithuania and in Geneva, Switzerland via prohibition of alcohol sales at petrol stations were associated with reductions in a range of harm outcomes (Wicki and Gmel 2011; Rehm *et al.* 2020), although in both cases, the availability interventions were confounded by other policy changes. Thus, the evidence is generally consistent—major changes involving increased access through a greater number of alcohol outlets influence both alcohol consumption and harm.

Other investigations have studied unplanned variation in density across time and space, exploring changes in alcohol outlet density at the local level. They have generally found links between outlet density and a wide range of outcomes, including street (Mair *et al.* 2013) and domestic (Livingston 2011a) violence, chronic disease (Livingston 2011b), sexually transmitted disease (Cohen *et al.* 2006), road crashes (Lipton *et al.* 2018), youth drinking (Rowland *et al.* 2016), and injury (Hobday *et al.* 2015). These studies broadly focus on alcohol outlet density as their indicator of availability, measured as the number of alcohol outlets of various types per capita (or some other relevant denominator such as area or roadway miles). Although Gmel *et al.* (2016) have noted inconsistencies in findings in this literature, the evidence is generally more consistent for studies with high-quality designs (Morrison *et al.* 2016). In the following, we review high-quality studies that have examined changes in alcohol outlet density over time.

While the natural experiment evidence shows reasonably consistent associations between large changes in alcohol availability and consumption levels, the evidence is less clear for smaller and more gradual changes. Long-term studies that can use robust **time-series** methods to provide better evidence of causality are relatively rare. Using data from four Canadian provinces over a period of 50 years, Trolldal (2005) found little evidence that availability influenced consumption once price was accounted for, whereas an econometric study from the United Kingdom found that wine and beer, but not spirits, consumption was associated with availability (Godfrey 1988).

In a rare longitudinal study of local-level availability and consumption, Fone *et al.* (2016) found that changes in the density of alcohol outlets within 10 minutes' walking distance of someone's home were associated with consumption changes, but more distal density measures (e.g. changes within 10 minutes' driving) were not. A Finnish cohort study examined consumption changes for individuals who changed their home address (Halonen *et al.* 2013), finding that moving closer to a bar increased the risk of heavy drinking for men and women, while moving closer to off-premises outlets increased drinking only for women. Studies focused explicitly on youth drinking have found that neighbourhood availability is associated with alcohol consumption for adolescents (e.g. Chen *et al.* 2009; Rowland *et al.* 2016). Thus, the evidence, though relatively weak, generally suggests that gradual changes in local-level availability do affect alcohol consumption.

There is much more evidence relating local-level alcohol availability to harm rates, using administrative data from police and health services. A 2015 systematic review of the literature found that over 90% of studies on the link between outlet density and violence found significant positive relationships (Fitterer *et al.* 2015). Key spatial-panel

studies from the United States, Wales, and Australia, along with a unique natural experiment from California (Yu *et al.* 2008), provide the most robust evidence. All found significant positive associations for outlets most associated with on-premises drinking (bars, pubs), but most found positive associations for off-premises outlets as well (e.g. Gruenewald and Remer 2006; Yu *et al.* 2008; Livingston 2011b). There is some evidence that associations are stronger in disadvantaged or high-density population areas. Overall, these studies point to a community-level effect of licensing policy on violence, which is supported by a **quasi-experimental** study showing larger reductions in violent crime where local authorities implemented policies to restrict physical availability (De Vocht *et al.* 2017).

There are fewer high-quality studies for other outcomes. Two longitudinal studies of domestic violence using broadly similar designs found associations in opposing directions for off-premises outlets (Livingston 2011a;, Cunradi *et al.* 2012). Longitudinal analyses of road crash outcomes found mixed associations that varied, depending on the outlet type and spatial scale used; however, they provide some support for a positive relationship between on-premises outlet density and crash rates (Lipton *et al.* 2018), especially in local areas (Fone *et al.* 2016). Studies using health data systems to examine the association between alcohol availability and hospital admissions or emergency presentations have also found positive associations (Hobday *et al.* 2015), including a high-quality study of changes in local-level licensing policy in the United Kingdom, which aimed at limiting new licences, especially in dense 'clusters' of existing availability (de Vocht *et al.* 2016). In summary, there is good evidence that local-level alcohol availability is associated with alcohol-related harm, especially violence, although the specific relationships are likely to vary between settings, and most of the high-quality longitudinal research comes from just a few **high-income countries**.

Although there is a substantial literature linking density to consumption and harm, findings in this area are increasingly being challenged by changes to the retail market for alcohol. For example, in Australia, there has been a shift toward 'big box' liquor stores with much larger catchments and sales volumes than existing off-premises outlets (Livingston 2017). This likely complicates the simple relationships drawn between outlet densities and harm rates in most studies. Indeed, the rare studies that incorporate sales data typically show that sales are more important than store density for off-premises outlets (e.g. Hobday *et al.* 2015). An even bigger shift is under way, with the sharp growth of online alcohol sales (usually involving home delivery) in many countries (Allday 2017). Although the proportion of alcohol sold in this way has been relatively low, there has been a sharp increase in some countries during the coronavirus disease (COVID-19) pandemic. There is little research into the impact of new forms of availability, with some early studies pointing to potential risks (Huckle *et al.* 2021). This clearly complicates the simple spatial relationships on which much of the outlet density literature is based.

Overall, there is reasonably strong evidence that changes in alcohol outlet density can affect alcohol consumption and alcohol-related problems, although these effects will likely vary across settings, regulatory systems, and time periods. Studies of natural experiments, especially of large-scale changes to availability, show relatively consistent impact on consumption and harm rates. High-quality studies exploring more gradual changes in availability are also broadly supportive of a relationship between

outlet density and harm, especially violence, and some well-designed studies point toward effects on consumption at the local level. A key consideration for policymakers at the local level is the pervasive inequality in exposure to alcohol outlets, based on neighbourhood demographics and other characteristics (e.g. Morrison *et al.* 2015). Liquor stores and pubs are potentially disruptive to the immediate neighbourhood, and residents of higher-status neighbourhoods tend to have much more influence in keeping them out (Romley *et al.* 2007). These inequalities likely contribute to the on-going socio-economic disparities observed in rates of alcohol-related harm.

8.2.4 Hours and days of trade

Restricting the days and times of alcohol sale reduces opportunities for purchasing alcohol. These restrictions can be focused on either reducing consumption in the general population (e.g. by restricting sales for off-site alcohol consumption on particular days of the week) or reducing specific alcohol-related problems such as violence and disorderly conduct related to late-night entertainment precincts (e.g. by restricting late-night hours for pubs, bars, and nightclubs).

8.2.4.1 Days of sale

A recent systematic review and **meta-analysis** examined the impact of temporal restrictions on consumption outcomes (Sherk *et al.* 2018), based on six well-designed studies from Sweden, the United States, and Canada, examining the impact of allowing an extra day per week for off-premises alcohol sales. All but one of these studies found significant increases in per capita consumption following implementation of the extra day of sale. Combined, they estimated that the additional day of sale per week was associated with a 3.4% increase in per capita consumption—5.3% (beer), 2.6% (wine), and 2.6% (spirits).

In terms of harms, a 2010 review found that changes to days of sale, especially for on-premises sales, correlated with harm rates (Middleton *et al.* 2010). More recently, a study of the effect of opening Swedish monopoly stores on Saturdays found an increase in self-reported experience of crime (Grönqvist and Niknami 2014); however, official statistics showed no significant change following Saturday trading (Norström and Skog 2005). A US study of 14 states where off-premises days of sale had increased found a corresponding increase in traffic fatalities in only one state (Stehr 2010). A study of crime outcomes in Virginia, however, suggested that increases in crime of between 5% and 10% occurred when off-premises Sunday trading was permitted (Heaton 2012). Although the evidence is inconsistent, findings suggest that allowing or restricting alcohol sales on particular days can affect population drinking levels and possibly influence harm rates as well.

8.2.4.2 Hours of sale

Restrictions on allowable hours of sale for alcohol usually focus on reducing availability late at night. This can be for off-premises sales where the aim is to reduce convenient purchasing for people already in the midst of a drinking session, or for

on-premises sales where reductions in late-night problems in entertainment precincts are the usual goal.

Only a few recent studies have addressed changing the allowable hours of sale for off-premises sales. One study focused on the implementation of restrictions in allowable off-premises trading hours in 72 (out of 83) regions in Russia in 2010, finding that restrictions—especially late at night—were associated with lower consumption levels (Kolosnitsyna *et al.* 2014). Studies of night-time restrictions on off-premises sales in Switzerland (Wicki and Gmel 2011; Wicki *et al.* 2020) and Germany (Marcus and Siedler 2015) all found significant reductions in hospital admissions for alcohol intoxication, especially for young people. Similar restrictions in Lithuania were associated with reductions in road crashes and alcohol-related injuries (Rehm *et al.* 2020).

In contrast, there is substantial research on the regulation of late-night trading hours for on-premises outlets, with systematic reviews (e.g. Wilkinson *et al.* 2016; Nepal *et al.* 2020) finding mostly consistent evidence that changes to trading hours generally lead to changes in harm rates (no studies examined consumption outcomes). For example, Nepal *et al.* (2020) identified 22 high-quality studies (including three of off-premises trading hours) and concluded that extensions of trading hours were followed by increases in harm (assault, injury, **drink driving**), whereas restrictions of trading hours were typically followed by reductions in harm. In terms of **effect size**, a study of 18 cities in Norway that implemented a series of extensions and restrictions of late-night trading (Rossow and Norström 2012) found that each additional hour of trading was associated with an increase in police-reported assaults of around 16% (with similar reductions when hours were reduced). Similarly, Kypri *et al.* (2014) showed that reductions in permitted hours in Newcastle, Australia from 5 a.m. to 3.30 a.m. led to reductions in assault of around 33%, with the effect maintained over 5 years.

Nevertheless, there are substantial variations across different settings and study designs, suggesting the relationship is not fixed. For example, in a recent evaluation involving two central areas of Sydney, Australia, assaults in the Kings Cross area fell by 38%, compared with just 10% in the Sydney central business district (Kypri and Livingston 2020). In the United Kingdom, relaxation of trading hour restrictions following the *Licensing Act 2003* had little impact on harms (Callan and Boyle 2018), although studies were generally of low quality and the degree to which availability actually increased varied substantially (Humphreys and Eisner 2014). There is also the possibility that at some point, earlier closing might create more problems than it solves, leading to more rapid consumption in an unsafe place (Graham 2012). Finally, the impact of changes in hours is also going to depend on the number of premises affected. For example, a recent study from New Zealand of new laws banning sales after 11 p.m. (for off-premises outlets) and 4 a.m. (for on-premises outlets) found that the ban affected the trading practices of fewer than 10% of outlets (Huckle *et al.* 2020).

There is little research on restricting hours of sale from outside the Anglo/Nordic jurisdictions, with the exception of a study from Diadema, Brazil (an industrial city near São Paolo) where the city changed from 24-hour on-premises opening to 11 p.m. closing (Duailibi *et al.* 2007). Time-series analysis found a reduction of almost nine murders per month and a non-significant reduction in assaults of women following implementation (see Figure 8.1).

Note: Homicide rate for july 2005 is on the basis of a half-month of data
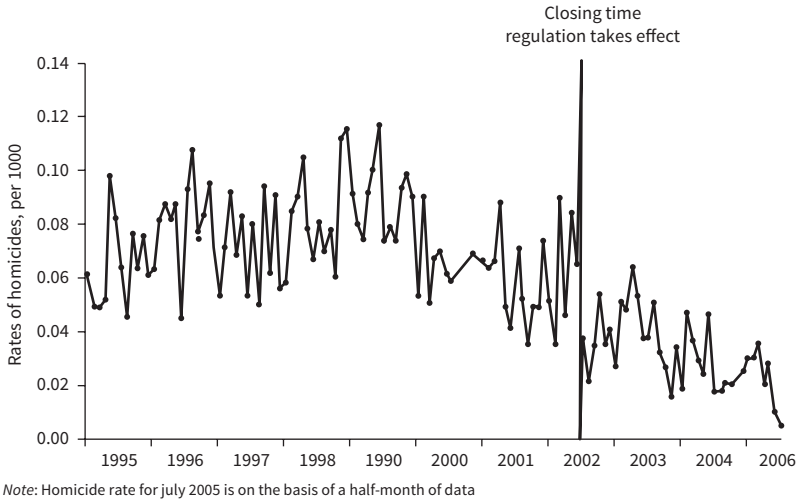
Figure 8.1 Homicide rate in Diadema, Brazil before and after mandated 11 p.m. bar closing times.

Reproduced with permission from Duailibi S, Ponicki W, Grube J, *et al.* (2007) 'The Effect of Restricting Opening Hours on Alcohol-Related Violence.' *American Journal of Public Health* 97(12): 2276–2280.

Regarding other types of alcohol sales, there have been no studies of the effects of changing the hours that alcohol home deliveries are permitted, although exploratory work suggests late-night deliveries are often linked to high-risk drinking occasions (Huckle *et al.* 2021).

In sum, there is strong and reasonably consistent evidence from a number of countries that changes to hours or days of trade have significant impact on the volume of alcohol consumed and on the rates of alcohol-related problems. When hours and days of sale are increased, consumption and harm increase, and vice versa.

8.3 Status and individual restrictions on eligibility to purchase alcohol

In the course of the twentieth century, individual-level and status controls on drinking were commonplace in many societies, particularly where initially restrictive systems of alcohol availability were set up as an alternative to general alcohol prohibition. Except in the specific areas of underage drinking and drink-driving countermeasures, these controls came to be seen in many places as bureaucratic infringements on individual rights, and most were accordingly abolished. Thus, the most common restrictions on sales at the beginning of the twenty-first century are the prohibition of alcohol sales to children and youths and the denial of sale to someone who is intoxicated.

8.3.1 Limiting availability by status: minimum alcohol purchasing age laws

Almost all countries have legal restrictions on the age at which young people may purchase, possess, or consume alcohol in public settings. These restrictions vary widely, ranging from 13 to 25 years of age, although most are set at 18 (World Health Organization 2018). In general, the terms **minimum legal drinking age** (MLDA) and **minimum legal purchase age** (MLPA) are used interchangeably, and in many jurisdictions, they are set at the same level. We use 'MLDA laws' here, unless there are specific issues related to purchasing. From a policy perspective, though, the difference matters—an MLPA implies that enforcement will be focused on the sellers of alcohol, which is likely to be more effective at reducing underage access to alcohol than the consumer-level enforcement implied by MLDA restrictions.

A comprehensive review (Wagenaar and Toomey 2002), based on 135 studies on legal drinking age—mostly from the United States—published between 1960 and 2000, concluded that increasing the legal age for purchase and consumption of alcohol to 21 is the most effective strategy for reducing drinking and drinking problems among high-school students, college students, and other youth, compared to a wide range of other programmes and efforts. A review of the 2006–2013 literature found similar results, i.e. increases to the MLDA in many US states during the 1980s reduced youth drinking and harms, especially traffic-related harms (DeJong and Blanchette 2014).

In two of the more comprehensive recent studies, Carpenter and Dobkin (2011, 2015) estimated the effects of changing the drinking age in the United States on public health and crime, estimating that the 18 to 21 rise in the drinking age reduced night-time traffic fatalities among 18- to 20-year olds by 17%, reduced suicide mortality, and had substantial impacts on arrest rates across a wide range of crimes, including alcohol-impaired driving, assault, and robbery. Carpenter and Dobkin also found that changes to the MLDA in the United States reduced drinking participation for 18- to 20-year-olds by 6.1%, **heavy episodic drinking** by 3.4%, and the frequency of past month drinking by 17%.

Studies from outside North America show similar results. Møller (2002) found that alcohol consumption for 11- to 14-year-olds in Denmark fell by 36% after a minimum 15-year age limit for off-premises purchases was introduced, though the study lacks control data or adjustment for long-term trends. In Australia, several studies (Smith and Burvill 1987; Jiang *et al.* 2015) found that lowering the drinking age to 18 in three Australian states was associated with increases in traffic-related deaths, hospital admissions, and rates of juvenile crime. Similarly, lowering the purchase age in New Zealand from 20 to 18 was associated with increased alcohol problems for 16- to 19-year olds (Gruenewald *et al.* 2015), traffic injuries among 15- to 19-year olds (Huckle and Parker 2014), and prosecutions for disorder offences among 14- to 15-year olds (Huckle *et al.* 2006).

The impact of the MLDA and MLPA on specific harms is probably influenced by the broader context. Thus, for example, a study from New South Wales, Australia found little impact on traffic-related harms when people reached 18, but substantial increases in drinking and hospital admissions, probably reflecting the effectiveness of Australia's existing restrictions on alcohol-impaired driving (Lindo *et al.* 2016) (see Chapter 11).

It is clear that the full benefits of a higher drinking age are only realized if the law is enforced. Research suggests that even moderate increases in enforcement can reduce sales to, and intoxication among, minors (Wagenaar *et al.* 2005). Accordingly, increased enforcement of minimum age laws has been the focus of various community-based interventions. For example, the US Communities Mobilizing for Change on Alcohol (CMCA) project, which focused on restricting access to alcohol at off-premises retail outlets and parties, resulted in reductions in arrests for alcohol-impaired driving and disorderly conduct among underage drinkers (Wagenaar *et al.* 2000). The increasing use of online delivery will also pose a considerable threat to enforcement of purchase age restrictions. In New Zealand, a majority of those under 25 reported no age checks in online sales (Huckle *et al.* 2021). Some jurisdictions set limits on who can *sell* alcohol, typically based on age. While there is some evidence that younger sellers are more likely to sell alcohol to underage purchasers (e.g. Rossow *et al.* 2008), there have been no evaluations of restrictions in this area.

Interventions such as enhanced enforcement and training servers to limit access for persons younger than the legal drinking age can also be included as a component of larger community programmes to prevent underage drinking, as in the CMCA project and other projects (e.g. Komro *et al.* 2017). Recently, several community interventions in Europe have focused on reducing access to alcohol among young people (Quigg *et al.* 2019). Modelled after the Swedish STAD project (described in Chapter 10), the interventions used various strategies such as forming a local steering committee, training alcohol servers, conducting community campaigns, and enhancing enforcement. Early findings reported mixed results, with evidence of increased ID checking and refusal of entry of underage persons in some countries, while other countries showed little impact. Despite the uneven outcomes from the project, the evidence suggests the potential for community mobilization approaches to prevent underage drinking in different countries (Quigg *et al.* 2019).

8.3.2 Limiting or banning alcohol sales to specific individuals

As rates of alcohol-related problems rose in the late twentieth century, politicians and other stakeholders tended to focus more on individual-level controls—particularly as alcohol industry interests were successful in resisting the alternative of increased population-level controls (Room 2012). A recurrent rhetoric by industry interests, indeed, has been to point to deficiencies in the individual drinker, rather than in the product, when discussing how to reduce alcohol-related harms (Room 2004). For example, Søgaard (2018) mentions the

Danish alcohol industry's agitation for more effective controls of 'irresponsible drinkers'. Subpopulations targeted by individual restrictions include college students, Indigenous communities, and those convicted of an alcohol-related crime. The literature on such measures is not well developed, and evidence on their effectiveness remains relatively sparse.

8.3.2.1 Individualized permit systems

Systems where only those with a permit were allowed to purchase alcohol were in operation before the 1960s in several government monopoly systems—including Ontario (Thompson and Genosko 2009, pp. 94–100), Finland (Lanu 1956), and Sweden (Tigerstedt 2000), although evaluation studies are rare and results mixed (Mäkelä *et al.* 2002; Room 2012).

In recent years, permit systems have focused on special populations, particularly Indigenous peoples. For example, a Banned Drinking Register (BDR) was reinstituted in September 2017 in Australia's Northern Territory where about 30% of the population is Aboriginal. Anyone purchasing off-premises alcohol in the Northern Territory must provide electronically scannable identification to be checked against the BDR. People are placed on the BDR by police, courts, or health and social services. Only preliminary evaluations of the BDR are available, with unclear results (Smith 2018).

8.3.2.2 Post-conviction preventive bans and enforcement

Currently, individual-level controls on drinking are mostly imposed following the legal process, often as a condition of parole or probation. The elaboration of such follow-up bans and enforcement is most developed for drink-driving (see Chapter 11). Studies of a driving-related drinking ban in the United States suggest these measures may reduce alcohol-related harm more broadly. The South Dakota 24/7 Sobriety Project required those convicted of alcohol-impaired driving to be breath-tested twice daily or to wear an alcohol monitor for a specified period. Failed tests (i.e. alcohol consumption) resulted in jail for one or two days. In addition to a 12% reduction in repeat drink-driving arrests, there was also a 9% reduction in domestic violence arrests (Kilmer *et al.* 2013) and detectable reductions in population mortality (Nicosia *et al.* 2016). Nevertheless, an attempt to replicate the programme's various elements to South London suggested that local resistance and structural incompatibility may limit its transferability and effectiveness (Bainbridge 2019).

8.3.2.3 Individual-level premises and zonal banning

In the later decades of the twentieth century, individualized drinking-related bans were instituted as a secondary prevention measure for drinking-related violence and disturbance in a number of places. Bans can apply to particular premises, groups of premises, or entire precincts. Evidence that these schemes are effective at reducing alcohol-related problems in entertainment precincts is scarce, whether bans are implemented by groups of licensees (e.g. Pubwatch in the United Kingdom (National Pubwatch 2012), Liquor Accords in Australia (Manton and Zajdow 2014)), or via police order (Søgaard 2018). See Chapter 10 for more details.

8.4 Other approaches to availability

8.4.1 Strength of alcoholic beverages

Lower alcohol-content beverages have been encouraged in some countries through policies that have made them more available or more affordable (see Chapter 8). For example, in the Nordic countries with alcohol monopolies, only low alcohol-content beverages can be sold outside the monopolies (e.g. in supermarkets), and thus availability is markedly lower for all beverages above a certain alcohol limit. As discussed in earlier sections, there have been a number of examples of stronger beer being introduced (and removed) from supermarkets in the Nordic countries, with evaluations generally (but not always) finding that overall consumption increased when stronger beer was made more available (and reduced when it was made less available) (Ramstedt 2002).

Recent years have seen increased attention on reducing alcohol strength as a means of reducing the alcohol's population health impact (Rehm *et al.* 2016). Small reductions in alcohol content of particular beverages would result in lower consumption of pure alcohol, if the volume and speed of drinking stayed the same (Lachenmeier *et al.* 2014). Indeed, Rehm and colleagues (2016) argue that reductions in alcohol strength may provide a rare situation where the interests of public health and those of the alcohol industry might overlap. However, the evidence remains unconvincing. In the United Kingdom, the government and industry have partnered in the Public Health Responsibility Deal (PHRD) involving significant promotion of lower-alcohol products (Knai *et al.* 2015). Although consumption has fallen, this decline is more likely attributable to other drivers of consumption (e.g. tax changes in 2011 and underlying trends in consumption preferences) (Holmes *et al.* 2015). Researchers have also argued that the PHRD allowed industry interests to successfully resist more evidence-based interventions such as minimum unit pricing (Hawkins and McCambridge 2019).

At the local level, many councils in the United Kingdom have implemented initiatives aimed at reducing the availability of high-strength alcohol products (e.g. white cider) under the 'Reducing the Strength' slogan. An evaluation of one such effort involving a large retail chain found little evidence that alcohol consumption was affected by the withdrawal of beer and cider products over 6.5% alcohol by volume (Pliakas *et al.* 2018). In contrast, restrictions on the sale of single-serve malt liquor beverages (typically >6% alcohol by volume) imposed by US cities on off-premises outlets led to crime reductions (McKee *et al.* 2017). In LMICs such as Vietnam and China, where beer has been heavily marketed and has increased in consumption, this has not been at the expense of the higher-potency beverages available (World Health Organization 2020).

8.4.2 Restrictions on containers

Changing the packaging of retail alcohol can influence consumption and harm. Swedish research has shown that the growth of box wine products (typically 3 litres or

more) contributed to an increase in wine consumption (Ramstedt and Trolldal 2017). In the United States, there is some evidence that sales of beer in large containers (>12 oz, 355 ml) contribute to higher road fatality rates (Hoke and Cotti 2015). Similarly, Australian research has shown that restrictions on large-volume containers in remote communities can reduce harm rates (e.g. Midford *et al.* 2010), although this finding may be attributable more to price than availability, as the restrictions apply mainly to cask wine, the cheapest alcoholic beverage in Australia.

8.4.3 Self-service

Over-the-counter sales (where an alcohol purchase has to be requested from a sales clerk) has been another way to restrict alcohol availability, primarily within the state retail monopolies in several countries. The transition from over-the-counter sales to self-service sales in Sweden and Norway was estimated to increase sales by around 10% (Skog 2000).

8.4.4 Non-commercial availability

Drinkers, especially young drinkers, use multiple sources to obtain alcohol. Social sources may be particularly important for underage drinkers, with non-commercial sources (e.g. parents, siblings, friends) making up the majority of supply for young people in many settings (Friese *et al.* 2011; Mattick *et al.* 2017). Thus, policies aimed at reducing alcohol availability for young people cannot focus exclusively on commercial availability but must also address social supply.

Some jurisdictions have enacted laws either prohibiting the supply of alcohol to underaged drinkers by anyone, except their parents (Roche *et al.* 2013), or making adults who supply alcohol to minors liable for any injury or damage they later cause (Grube and Nygaard 2005). There are few evaluations of these policies, with US studies of social host liability laws providing mixed evidence of effectiveness (Whetten-Goldstein *et al.* 2000; Dills 2010). An early evaluation of laws preventing social supply in New Zealand found evidence of small reductions in self-reported supply (Huckle *et al.* 2019). These mixed findings may reflect the lack of a comprehensive programme that makes social hosts aware of their potential liability and of the law's enforcement. Social host liability must be effectively communicated and enforced to have a deterrent effect.

8.4.5 Sales restrictions in particular settings

Policies can also target specific events or locations where drinking occurs, such as drinking in parks or recreational locations or in the workplace. Event-based restrictions have mostly been studied in the context of sporting venues. Bormann and Stone (2001) found dramatic declines in arrests, assaults, and ejections from the University of Colorado stadium in 1996 following a ban on alcohol sales. Similarly, a study of

seven college football stadiums found lower rates of criminal incidents where alcohol restrictions were in place (Menaker and Chaney 2014). This literature remains relatively weak, although alcohol restrictions are common in sports stadiums globally (Bormann and Stone 2001).

Place-based restrictions usually focus on public settings. Such restrictions have the potential to affect youth drinking in particular, since youths often use public venues (e.g. public parks, beaches, lakes, etc.) for drinking (Hibell *et al.* 2004). Banning drinking in such locations could also reduce social access to alcohol (Conway 2002). However, a review of public drinking bans found that while they improve community perceptions of safety and amenity, there is little evidence that they reduce public drinking or harm and they are often enforced in ways that negatively impact already marginalized groups (Pennay and Room 2012).

8.5 Summarizing the impact of regulating alcohol availability

Research supports the conclusion that restrictions on alcohol availability can contribute to the reduction of alcohol problems, especially where changes in availability are substantial. More commonly, availability changes gradually, or restrictions are implemented alongside a range of other policy interventions, which makes causal attribution difficult to ascertain. Implementing a range of evidence-based availability policies can have substantial health impacts, particularly when other interventions (e.g. on price) are also utilized. Lithuania provides a compelling illustration, as described in Box 8.2.

As described in Chapter 6 and ⊜ Online Appendix 1, the strategies and interventions reviewed in this chapter were rated by the authors in terms of their evidence of effectiveness and amount of research support. Table 8.1 provides the authors' consensus

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Box 8.2 Comprehensive alcohol policy interventions in Lithuania

From 2001 onwards, a series of alcohol interventions with a public health orientation have been implemented in Lithuania. These included increases in taxation, changes to drink-driving laws, advertising restrictions, and a series of interventions aimed at reducing availability. Availability restrictions included removal of alcohol sales from petrol stations, restrictions on hours of trade for off-premises outlets, and increases to the minimum legal drinking age (Stelemekas *et al.* 2021). Research has identified major reductions in alcohol-related harms due to these measures (Stumbrys *et al.* 2020), large enough to result in declines in all-cause mortality in the population. Carefully conducted analyses have shown that the availability restrictions were a key component in the decline, alongside price-related interventions. The results from Lithuania provide clear evidence that comprehensive alcohol policy interventions can have dramatic impacts on health at the population level.

Table 8.1 Consensus ratings of strategies and interventions to control alcohol availability[c]

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Total bans	++	++	Can reduce consumption and harm substantially, but in some cases, with adverse side effects from black market, which is expensive to suppress. Ineffective without enforcement
Rationing systems	++	+	Evidence largely from several historical examples in a few countries. Can particularly affect heavy and problem drinkers. Enforcing rations requires a highly regulated market
Bans on drinking in public places	?	+	Generally focused on young or marginalized high-risk drinkers; may temporarily reduce consumption and harms but can also displace harm without necessarily reducing it. Costs associated with enforcement could be substantial
Restricting days of sale	++	++	Reviews generally find evidence that expanding (or reducing) days of sale increases (or decreases) consumption and some associated harms (e.g. traffic accidents). Studies are largely from North America and the Nordic countries. Likely to have a broad population reach
Restricting hours of sale for bars, pubs, etc.	++	++	Clear evidence that violence around entertainment precincts is affected by changes to permitted trading hours late at night
Restricting hours of sale for off-premises outlets	++	+	Relatively few well-designed studies, mainly from high-income countries. Effects on harms from drinking (e.g. injury, intoxication), especially among young people. Likely to have a broad population reach
Policies affecting alcohol outlet density	+/++	+++	Major changes to outlet density (e.g. permitting or restricting sales in supermarkets) clearly affect consumption and harm rates. Evidence for gradual changes varies between jurisdictions, licence types, and outcomes, and is strongest for violence. Specific policies to shape gradual changes in density rarely evaluated
Government retail monopolies	++	++	Effective way to limit alcohol consumption and harm. Priority given to public health and public order goals increases beneficial effects. Have a broad population reach
Minimum alcohol purchasing age laws	+++	++	Clear and consistent evidence across a range of countries. Effective in reducing traffic fatalities and other harms with minimal enforcement, but enforcement substantially increases effectiveness and cost. Community programmes that increase compliance have been effective. Evidence primarily from the United States about changes from age 18 to 21

(continued)

Table 8.1 Continued

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Individualized permit systems	+	+	Limited evidence from historical permit systems in Canada and the Nordic countries, often combined with rationing. Some evidence that consumption and harm increase with abolition of the systems
Post-conviction preventive bans and enforcement	++	+	Intensive intervention requiring comprehensive monitoring of banned individuals. Implemented largely around drink-driving offences, but reductions in other harms detected at the population level in some cases
Individual-level premises and entertainment district banning	?	+	Various systems focused on restricting access to late-night entertainment venues (pubs, bars) or precincts for problematic individuals. Generally poorly evaluated
Availability policies encouraging lower-alcohol content beverages	+	+	Mostly tested for beer in the Nordic countries, with low-alcohol beer more widely available than full-strength or other alcoholic beverages. Evidence from Sweden that differential availability reduced hospitalization rates among teenagers
Restrictions on container sizes/types	?	+	Few studies, none well designed, suggesting that availability of larger containers (e.g. boxed wine) can influence consumption. Probably related to lower price per unit
Sales restrictions in particular settings (e.g. sports stadiums)	+	+	Few studies, but promising evidence in particular settings that restrictions can reduce harms (e.g. banning alcohol in sports stadiums can reduce intoxication/injury)

[a] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ evidence of a strong effect on consumption or problems; ? One or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[b] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include LMICs; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in LMICs.

[c] For further information, please see ⬛ Online Appendix 1.

ratings for the strategies for which there is a minimum number of evaluation studies (see Chapter 7). There are a number of interventions with relatively strong evidence of effectiveness, but these are often infeasible for political and social reasons. These include general rationing systems, creation of government retail monopolies, and total bans on sales. Although total bans are infeasible in most countries, they are possible under some circumstances, as shown in Fig. 8.2 and described in more detail in Box 8.1.

More feasible policies with strong evidence include restrictions on the spatial and temporal availability of alcohol, which are consistently associated with reductions in both alcohol use and alcohol-related problems. This is especially true for policies that lead to major changes in the physical availability of alcohol and those that restrict alcohol availability late at night. More gradual changes to availability at the local level are likely to influence some harm rates, especially violence, but inconsistencies in the literature highlight the need for evidence from a wider range of settings with stronger designs.

For young people, laws that raise the minimum legal purchase age reduce alcohol sales and related problems. This strategy has strong empirical support, with dozens of studies finding substantial impact on traffic and other casualties from changes to the drinking age. Interventions which improve the enforcement of existing restrictions on purchase ages are also effective.

In recent decades, there have been a number of schemes applying individual-level controls selectively on the basis of a problematic event. As the South Dakota 24/7 Sobriety Project (Kilmer *et al.* 2013) shows, when the criterion for success in such an intervention can be openly applied and accurately monitored, as with a requirement of abstinence for a specified period, it can have substantial effects. Experience suggests that effects of individually focused restrictions are muted at best in circumstances short of this.
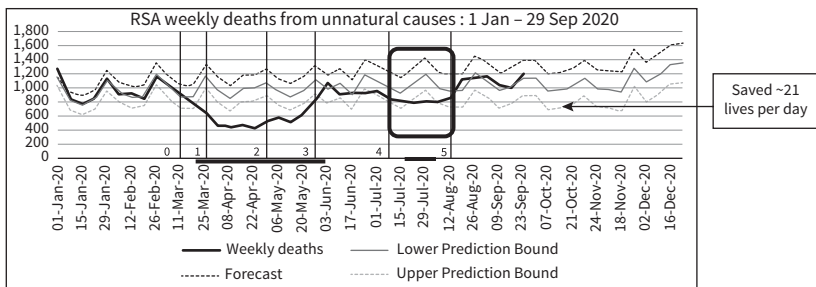
Vertical time lines:
0. Week Disaster Management Act implemented
1. Week lockdown level 5 introduced
2. Week lockdown changed to level 4 with curfew
3. Week lockdown changed to level 3 including unbanning sale of alcohol
4. Week sale of alcohol re-banned and curfew re-introduced
5. Week lockdown changed to level 2 including unbanning of alcohol

Numbers have been scaled to the estimated acutal number of death and for the last week has been adjusted for delayed registrations

Figure 8.2 The impact of alcohol restrictions on unnatural death rates in South Africa.

Reproduced with permission from Duailibi S, Ponicki W, Grube J, *et al.* (2007) 'The Effect of Restricting Opening Hours on Alcohol-Related Violence.' *American Journal of Public Health* 97(12): 2276–2280.

While most of the research on restricting physical availability comes from more economically developed countries, cross-sectional evidence suggests that drinking is lower in LMICs when physical availability regulations are strong (Cook *et al.* 2014). Thus, physical availability policies are likely to be important in managing alcohol-related problems as consumption grows with economic growth in LMICs.

The cost of restricting the physical availability of alcohol is low, relative to the social and health costs related to drinking, especially heavy drinking. Cost-effectiveness analyses have generally shown that reductions in outlet density and trading days/hours and increases in the minimum legal drinking age are cost-effective policy options (Burton *et al.* 2017). Regulation of availability, backed up with enforcement, can be effective and cost-effective in reducing alcohol consumption and problems.

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9

Restrictions on marketing

9.1 Introduction

Marketing refers to all elements of the effort to sell commercially produced alcohol. Along with advertising and other promotions, marketing encompasses the design of the product, the price charged, and the place and ease of access. Also recognized as part of the modern marketing mix are the people who are in contact with consumers, the processes of delivery such as online access, and elements of the physical environment the customer experiences. All of these have long been part of the marketing mix, but the development of digital technology in the twenty-first century has provided powerful new tools for integrated marketing campaigns. In particular, digital marketing enables highly effective targeting of marketing messages (Carah 2017). The marketing effort is now almost ubiquitous globally and alcohol is advertised about three times as much as the average advertised product (Saffer 2020).

The pervasiveness of marketing in **digital platforms** has increased the intensity of cross-border marketing. This has implications for public health policies since marketing is essential to the expansion of the markets of **transnational alcohol corporations**[1] (TNACs) into regions, countries, and population groups not already high users of commercial alcohol products. Cross-border marketing is also used to combat the stabilization of alcohol consumption in some sectors in **high-income countries** (HICs). Large and powerful global actors are involved in cross-border marketing, including TNACs and their public relations operations, satellite TV corporations, digital platforms, global sports organizations, and the travel retail industry.

There have been few examples of comprehensive policy changes in this area. National-level regulations to control exposure to marketing in general or to specific types of content in particular have generally affected only part of the marketing landscape. The fast-developing operations of the digital platforms are neither visible nor well understood and no effective policy constraints have been put in place (Carah and Brodmerkel 2021).

The alcohol and advertising industries and, more recently, the digital platforms have put considerable effort into the establishment of ineffective voluntary codes, under the framing of self-regulation (Noel *et al.* 2017a, b).

The effects of marketing on beliefs and social norms about alcohol counteract possible effects from health promotion activities (Wallack 1983; Alhabash *et al.* 2015). Widespread marketing in both HICs and **low- and middle-income countries**

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

(LMICs) promoting alcohol as a positive and commonplace element of everyday life may, in turn, affect the acceptability of more restrictive policies and practices. In effect, marketing is a force for ensuring that alcohol is dealt with as if it were an ordinary commodity (Casswell 1997).

In this chapter, we first provide a brief introduction to the current state of alcohol marketing; second, the impact of marketing is evaluated, and third, different policy approaches are assessed for their impact on consumption and harm. The marketing potential of **corporate social responsibility** (CSR) activities is dealt with in Chapter 5.

9.2 Alcohol marketing practices

9.2.1 Integrated marketing campaigns

Integrated marketing campaigns previously focused on ensuring consistent advertising messaging in numerous channels, including broadcast and print mass media, billboards, and direct mail. Integration now incorporates the 'hard' analytic components of marketing (research and data analytics for targeting, product design, servicescape design, distribution design) with the 'soft' cultural and communicative elements such as advertising, public relations, and CSR (Carah 2017).

Data analytics allows marketing to reach targeted consumers at particular moments, including particular affective states, identifying links between consumers and products or sending direct purchase invitations targeted to specific times and responsive to consumers' moods, expressions, or location (Carah and Brodmerkel 2021). The viewer's response to the marketing (e.g. the click of the 'buy' button) provides new data. In this way, an ever more powerful marketing resource is developed. The platforms now rely less on public posts and more on ephemeral and **influencer**-oriented tactics, many of which are 'dark' (i.e. obscure) to others than those being targeted (Carah and Brodmerkel 2021). Influencers (especially social media users with large followings) partner with brands to promote products, in many cases by incorporating the product into their content without clear disclosure of their financial relationship with the brand or the seller. A content analysis of Instagram posts by influencers in 2019 showed that the majority had posted about alcohol recently, and only a few of these posts disclosed this as an advertisement. Posts without sponsorship disclosures yielded more likes and comments than posts with such disclosures (Hendriks *et al.* 2020).

9.2.2 The alcohol industry and digital marketing

The alcohol industry were early adopters of digital marketing, with Diageo, one of the world's largest producers of spirits and beers, entering an agreement with Facebook in 2011 (Shearman 2011) and cross-directorates and cross-appointments allowing expertise to be shared (Bevnet 2014). By 2012, alcohol brands were reported to have the highest engagement rate of any industries on Facebook (Social Bakers 2012). By 2017, TNACs such as Heineken had concentrated their advertising and marketing budgets on digital platforms, in place of traditional broadcasting (Joseph 2017).

The shift of much of the TNACs' marketing expenditure to the digital platforms relies for its effectiveness on the fast expansion of digital connectivity. In 2020, more than half of the world's population were Internet users and 49% of the population were active social media users (Hootsuite 2020). Smart phones are a primary mode of digital marketing. In LMICs, they are more likely to be owned by the prime targets for alcohol marketing, namely younger, better educated, and higher-income people (Silver 2019). In Asia, a major target market for TNACs, more than half of the population of most countries use social media (Statista 2020).

Africa has lower penetration but it is increasing fast and digital technology supplements other marketing approaches. For example, in Nigeria, the Diageo brand Guinness is heavily advertised in football viewing centres, commercial venues in which internet facilities are provided to allow those without a private connection to follow live football games (Dumbili and Williams 2017).

9.2.3 Branding via sponsorship and brand stretching

Sports and cultural events, particularly those with appeal to young people, are widely sponsored and branded by alcohol companies. Branded sports events provide the opportunity to build the brand into the experience of the event through sports commentaries and signage on clothing, sports grounds, and products retailed to fans. Social media activations, for example, using augmented reality apps, have vastly expanded the reach of sponsorships and their ability to increase engagement with brands (see Box 9.1). Sports played entirely in the digital world provide new opportunities for alcohol branding (see Box 9.2).

Box 9.1 International sporting events as marketing opportunities

Alcohol brands have replaced tobacco sponsorships following the success of the Framework Convention on Tobacco Control. In 2018, sponsors of Formula One included four alcohol brands (Martini, Chandon, Singha, and Kingfisher) branding specific teams, and Johnnie Walker and Heineken were Formula One sponsors (Rencken 2018).

Formula One has expanded its audience and fan base by encouraging participants to use social media to disseminate behind-the-scenes activities (Global Marketing Professor 2019) and by the introduction of a global digital subscription channel providing ad-free live streams of each race, with on-board cameras showing live content from the driver's point of view.

These mammoth international sporting events also allow the TNACs to promote their CSR activity. Bacardi-owned drinks brand Martini shared Facebook, Twitter, and Instagram content about the team and its drivers ahead of each race and stressed its commitment to responsible drinking through a deal with Formula One in 2014. Heineken has also used its major sponsorship of Formula One to promulgate a 'Don't drink and drive' message in emerging markets such as Vietnam (Lim 2019).

Box 9.2 New opportunity for branding within the digital world—eSports

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China's oldest beer brand Harbin has been targeted at males aged 18–29 through a series of collaborations and sponsorships of China's eSports leagues. The Anheuser-Busch InBev-owned brand is the most successful domestic beer brand in China. In order to reposition the beer, AB InBev rolled out a new marketing campaign revolving around eSports (video game events), which are popular among young Chinese millennial consumers. AB InBev's innovative marketing strategy is claimed to have dramatically raised sales volumes of Harbin at a time when domestic sales of beer were slowing down by successfully appealing to Chinese millennial men who are willing to spend more on premium beer products.

A senior marketing director at AB InBev commented: 'We spare no efforts in targeting people who have different interests, whether it is music or eSports. We believe young people no longer focus on boring TV commercials, as many are not watching TV any longer' (Kuiler 2017).

Sponsorships also provide opportunities for CSR initiatives, such as the promotion of gender equality, and at the same time increase drinking by women (see Box 9.3).

At music festivals, brands create themed venues where consumers are encouraged to circulate images and videos that weave brands into the stories they tell about themselves using their smart phones. These images and videos then provide brands with data that are used to better target them (Carah and Brodmerkel 2021).

Brand stretching, the use of alcohol brand logos on non-alcohol products, which allows circumvention of restrictions on alcohol marketing, is common. In Russia,

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Box 9.3 Marketing to increase women's drinking

Marketing strategies to increase and normalize drinking by women are used throughout the world in both LMICs and HICs. These include the development and packaging of products such as ready-to-serve drinks, including Snapp, advertised as a 'naturally refreshing, fruit flavoured alcoholic drink for the modern, sophisticated and classy woman' and promoted on the African continent in 2012.

Most recently, some alcohol companies have taken to using themes of women's empowerment (Tunney 2018; Emslie 2019) and social responsibility to market to women (Mart and Giesbrecht 2015). For example, in 2018, Smirnoff partnered with the digital music service Spotify to create the 'Smirnoff Equalizer' playlist that has an equal proportion of male and female artists (Diageo 2018). Smirnoff Equalizer aims to increase the representation of women in music by using an algorithm to suggest songs by women artists that match the listener's music preferences. The association of Smirnoff with women's equality presents them as a socially aware company that tackles issues directly impacting women, while simultaneously promoting their products.

> **Box 9.4   Marketing implications of non-alcoholic beer**
>
> Heineken switched its sponsorship of the Union of European Football Association's Europa League from its Amstel brand to Heineken 0.0 (Sousa 2020), with the resumption of the competition in 2020 through to June 2024. This reflects the strength of the alcohol-free trend. The partnership was the largest single sponsorship deal involving a single non-alcoholic beer brand.
>
> Implications for alcohol marketing regulation have been raised: 'Heineken 0.0 may be an alcohol-free variant but it is still a beer made by Heineken. Given its name and livery, any advertising or promotion of Heineken 0.0 also benefits the core Heineken brand' (Cooper 2020). Whether non-alcoholic beer is a way to promote alcoholic beer has been debated in Malaysia, a predominantly Muslim country where Heineken 0.0 has been promoted in convenience stores, and in Thailand which has relatively strict restrictions on alcohol marketing (Neo 2019).

which restricts many forms of alcohol marketing, the legislation nevertheless allows the promotion of alcohol brands through non-alcohol products such as ice cream. Box 9.4 describes the use of this practice in several other countries.

9.2.4   Product placement

The marketing value of product placement is suggested by reports of Heineken having paid an estimated US$45 million for placement in the 2012 James Bond movie Skyfall, in which Bond no longer drinks Martini, but Heineken (McKee 2014). Placements occur in digital media such as console-based video games, online games, mobile phone apps, music videos, and social media sites (Eagle and Dahl 2018). Between 2005 and 2007, one in five songs sampled from US pop music had explicit references to alcohol. One-quarter of these mentioned a brand. References were commonly associated with wealth, sex, partying, and other drugs (Primack *et al.* 2012). YouTube videos, including those containing branding, were found to overtly encourage excessive drinking and drunkenness (Cranwell *et al.* 2017).

9.2.5   Product design

Increasing health consciousness is perceived by industry analysts as a trend that strongly affects the alcohol industry and is addressed through product development and marketing in relation to avoidance of sugar and preservatives, and to adding nutrients and promoting lower-potency, including non-alcohol, products (Keric and Stafford 2019). Molson Coors promoted a low-alcohol beer in response to popular engagement in Dry January, a consumer-driven month of non-drinking, which was reframed in their social media campaign: 'Because why go completely dry when you could go Dry-ish?' (Beverage Industry 2019).

9.2.6   Distribution

Marketing at the place of sale has become increasingly important, with the expansion of alcohol sales into more retail outlets and retailers playing a greater role in marketing (White *et al.* 2015). Alcohol is increasingly available via online sales, with digital platforms providing a seamless opportunity to make a purchase in connection with tailored promotions (Carah and Brodmerkel 2021). Analysis of online sales in Australia has shown that retailers offer products cheaply, accompanied by heavy promotion and price discounting, without adequate age verification (Colbert *et al.* 2020).

9.2.7   Summary

As one of the most highly advertised products, alcohol brands make use of every promotional opportunity. Product design and distribution are integral parts of alcohol marketing and there is a brand for every preference and price point, made as easily available as possible. Increasingly, marketers use digital marketing and collection of digital data has dramatically increased the level of potential targeting, raising concerns about the increased risk to people already experiencing problems from alcohol use, as well as to younger people. LMICs are important markets for growth, and marketing is an essential part of this. Section 9.3 reviews the extensive research on the impact of alcohol marketing.

9.3 Impacts of alcohol marketing

9.3.1 Empirical evidence of alcohol marketing effects

A series of econometric studies investigating the impact of marketing on total population consumption were carried out between 1970 and 2010, often using expenditure on measured media as a proxy for exposure to advertising. They reported mixed results. A **meta-analysis** of 132 econometric studies found a small positive **elasticity** between advertising and alcohol consumption that was significant, but only in relation to spirits advertising (Gallet 2007). Small **effect sizes** of marketing at the aggregate level have been found in better-designed econometric studies (Saffer 2020). However, econometric studies have been criticized on several grounds, including the presumption that expenditure is equivalent to the power of advertising and the lack of identification of subgroups such as younger consumers (Saffer 1998, 2020; Hastings *et al.* 2005). Expenditure on the measured media, usually television and print media, was also known to have been an underestimation of marketing activity (Stewart and Rice 1995). Aggregate-level analysis using expenditure on advertising over time has been limited by the minimal amount of variability over time in the levels of marketing relative to the total marketing effort, especially in HICs. Targeting of messages is an integral part of marketing. Exposure to messages that are not pertinent means that

small effect sizes found in studies which rely on aggregate measures of exposure and **alcohol per capita consumption** (APC) could also be caused by inadequate study designs (Meier 2011; Niederdeppe *et al.* 2021).

Experimental methods have investigated the effect of short-term exposure to alcohol marketing. A meta-analysis integrating seven studies carried out with students found that viewing alcohol advertisements increased immediate alcohol consumption, relative to viewing non-alcohol advertisements (Stautz *et al.* 2016). A subsequent experimental study compared students' responses after exposure to Facebook ads for either beer or water. Participants were more likely to select a gift card for a bar than for a coffee shop upon exposure to beer ads (Alhabash *et al.* 2016).

The evidence of short-term impacts of alcohol marketing is important, but the full effect of exposure to ads with consistent messages is likely to be cumulative—over time, effects are likely to be bigger (Gerbner 1995; Zwarun *et al.* 2006; Stautz *et al.* 2016; Martino *et al.* 2018). Longer-term effects over several years have also been reported in industry case studies of alcohol marketing effects (Hessari *et al.* 2019).

Longitudinal studies are especially valuable for investigating the cumulative effect of marketing. A systematic review of longitudinal studies published between 2008 and 2016 concluded that young people who have greater exposure to alcohol marketing appear to be more likely subsequently to initiate alcohol use and engage in binge and **hazardous drinking** (Jernigan *et al.* 2017), supporting previous reviews of earlier longitudinal studies (e.g. Anderson *et al.* 2009; Gordon *et al.* 2010).

A systematic review of cross-sectional studies from 1980 until 2015 found alcohol marketing exposure was associated with adolescents' and young adults' alcohol use behaviours. These positive associations were observed across the past four decades, in many different countries, and with small and large samples (Finan *et al.* 2020). This review of cross-sectional studies suggested, in general, that alcohol promotions such as free samples and owning alcohol-related merchandise were more consistently related to increased drinking than other types of advertising exposures (Finan *et al.* 2020). Alcohol-branded merchandise has a longer shelf-life than other forms of alcohol marketing and it has the potential to become integrated into people's self-identities. A review of alcohol-branded merchandise ownership has found associations with current and future drinking (Jones 2016). In Thailand, the ownership of alcohol-branded merchandise, available despite restrictions on alcohol marketing, showed a relationship with binge drinking (Jauchuen *et al.* 2015). Free samples given to young people in two LMICs were associated with survey reports of intoxication (Swahn *et al.* 2011, 2013). In South Africa, a middle-income country, exposure to alcohol promotions and advertising through SMS messages and free offers when buying alcohol all impacted heavy drinking (Petersen Williams *et al.* 2019).

A summary of both systematic and narrative reviews of extensive research on the impacts of (mainly non-digital) marketing on consumption by young people concluded that the research, conducted in a variety of countries using different, but complementary, research designs, is consistent with the judgement that the association between alcohol marketing and drinking by young persons is causal (Sargent and Babor 2020).

Similar conclusions can be drawn from reviews of the digital marketing literature. Studies of digital marketing suggest that exposure to, and engagement with, alcohol

marketing is positively associated with increased alcohol consumption and increased binge or hazardous drinking behaviour. A meta-analysis of 19 studies of impacts of social media on alcohol use among adolescents and young adults found greater alcohol-related social media engagement was correlated with both greater self-reported drinking and alcohol-related problems (Curtis *et al.* 2018). A review of 15 studies reported that exposure to internet-based alcohol-related content was associated with intentions to drink and positive attitudes toward alcohol drinking among young people (Gupta *et al.* 2016).

In the digital media, influencers, people paid to promote products, are major contributors to alcohol posts which show a positive social context and are therefore likely to affect alcohol-drinking behaviours in the same way user posts have been shown to do (Hendriks *et al.* 2020). Industry reports confirm the value of their investment; influential shoppers in New York and Toronto recruited to become 'ambassadors' for Stella Artois were described as the brand's most powerful sales force (WARC 2011).

9.3.2 Mechanisms of marketing impact

A neurobiological model, which considered neurodevelopmental risk factors, social influences, and reward sensitization to alcohol cues, suggested that exposure of young people to alcohol marketing could plausibly influence underage drinking by sensitizing prefrontal-reward circuitry (Courtney *et al.* 2020). Much advertising is processed using low cognitive involvement (Heath 2001) and mere exposure enhances liking (Grimes 2008); thus, preference can be created by simply repeating message exposure, with no active cognitive involvement (Zhu *et al.* 2015). Exposure in the context of an exciting and dynamic sports or cultural event increased positive attitudes toward alcohol, as well as toward the specific brand. These effects seem to rely on non-conscious automatic processes (Zerhouni *et al.* 2019). A systematic review of research on alcohol-branded sports sponsorship found consistent positive associations between exposure to alcohol sponsorship and increased levels of consumption, including risky drinking among both adult sportspeople and schoolchildren (Brown 2016).

Exposure to marketing is an essential precursor to marketing effects. In addition to evidence for effects of 'mere exposure' (Alhabash *et al.* 2016), engagement (i.e. requiring greater cognitive and emotional involvement) has become a major aim of marketing. Engagement is reflected in the physical world (e.g. ownership of branded merchandise) (Jones *et al.* 2016) and in the digital world (e.g. liking, sharing, commenting on alcohol brand material and co-creating marketing material) (Alhabash *et al.* 2015; Carrotte *et al.* 2016; Buchanan *et al.* 2018). A systematic review of literature up until 2017 found more evidence for an effect of increased alcohol consumption from participation and engagement in digital marketing than from exposure to more traditional forms of marketing (Noel *et al.* 2020). Research published since the systematic review supports the importance of the participatory aspects of social media for commercial marketing, and the impact of user-created promotion on high-risk consumption and brand identification (Critchlow *et al.* 2019).

Interactive relationships with specific brands resulting in a brand allegiance predicted heavier consumption later in life (Casswell and Zhang 1998; Jernigan *et al.* 2017). Marketing also impacts perception of peer norms, which, in turn, is related to problem drinking (McClure *et al.* 2013). The behaviour and attitudes of peers are used to assess whether an individual's own actions are consistent with group norms (de Gregorio and Sung 2010; Atkinson *et al.* 2017). For example, YouTube videos containing alcohol brand promotion and featuring young adults who appear to be under the legal age for alcohol consumption (Barry *et al.* 2015) are likely to influence norms around youthful drinking (Eagle and Dahl 2018). Much of the marketing that targets young people is driven by an understanding of the importance of alcohol consumption for identity formation. The advertising is designed to provide humour, ideas, images, phrases, and other resources that are used in the process of peer-to-peer interaction, as identity is formed and communicated (McCreanor *et al.* 2005). Children as young as 14 have been found to be selecting brands with which to engage on social media in order to communicate identity (Purves *et al.* 2018).

9.3.3 Target markets and vulnerability

The impact of alcohol marketing is greater among some population subgroups and may reflect characteristics of the audience and its disproportionate exposure. Marketing research suggests that the cumulative effect of repeated exposure, coupled with other socio-psychological factors, contributes to increased alcohol consumption among vulnerable populations (Alhabash *et al.* 2016, p. 56). While early research conducted by Anheuser-Busch aimed to increase the potency of advertising by linking products with the personality types of consumers (Ackoff and Emshoff 1975a, b), targeting has moved to new levels, given the opportunities to use digital data to identity individuals and subgroups most susceptible in order to tailor marketing to them.

Much research on alcohol marketing has focused on children and teenagers. As outlined earlier, systematic reviews of exposure and engagement with both established and digital marketing have shown an impact of marketing on young people's attitudes and drinking behaviours. Heavier alcohol use among those with extensive social media use suggests that these online platforms are arenas where adolescents are exposed to positive alcohol preferences and alcohol advertising without parental supervision (Larm *et al.* 2019).

While young people have been the subject of most research, there is also growing evidence that marketing influences adults as well. Exposure to TV ads among adults in the United States was consistently associated with the likelihood of drinking in the past month and with drinking more alcohol (Niederdeppe *et al.* 2021). Liking or following digital alcohol marketing pages is common, regardless of age. It was associated with riskier alcohol consumption in a study of young adult Australians (Carrotte *et al.* 2016). In another study (Critchlow *et al.* 2016), digital marketing was associated with increased frequency of **heavy episodic drinking** (HED) in young adults and was more successful than traditional media in reaching them.

Heavier adult drinkers have been found to be more receptive to alcohol marketing, making them more vulnerable to its effects. For example, an experimental study of exposure to beer ads on Facebook found that the ads had stronger effects on intentions to consume alcohol among those with higher scores on a measure of alcohol involvement and those with greater familiarity with the brand shown (Alhabash *et al.* 2016). Students with a history of heavy alcohol use perceived greater amounts of alcohol being consumed in alcohol ads, compared with those without such a history, and they perceived this consumption, which often met the definition for HED, to be 'responsible' (Noel *et al.* 2018). Exposure to marketing had stronger impacts among more frequent drinkers (Koordeman *et al.* 2011), as well as on riskier drinkers (Alhabash *et al.* 2016). Qualitative research has shown negative impacts of alcohol marketing on those trying to reduce problematic drinking (Thomson *et al.* 1997). It is likely that the algorithmic models of digital platforms, which are designed to learn the preferences and vulnerabilities of consumers, are used to identify high-volume consumers and target them with discounted alcohol products (Carah and Brodmerkel 2021).

In emerging markets, the recruitment of non-drinking adults to become drinkers is a critically important function of marketing for the alcohol industry (Benegal 2005), and the marketing also contributes to normalization of drinking for an expanding range of occasions (Walls *et al.* 2020).

In both mature and emerging markets, women are an untapped sector for which marketing can play an important role in expansion of the industry's customer base. Exposure to alcohol advertisements was related to hazardous drinking among South African women (Amanuel *et al.* 2018), who also report greater liking for marketing than men (Petersen Williams *et al.* 2019). In many jurisdictions, there is clear evidence of marketing aimed directly at women through the development of female-oriented beverages, packages, and campaigns (Emslie 2019) (Box 9.3).

9.3.4 Normalization of alcohol use

Models of message interpretation processes predict that with repeated exposure, alcohol marketing messages perceived as relevant will become progressively internalized, so that they are cognitively more available during the actual decision-making situation. This is a process of normalization, with alcohol appearing ubiquitous and a part of normal life (Meier 2011), which may, in turn, have broader effects in justifying a lack of specific alcohol regulation (Casswell 2012).

9.3.5 Summary

There is considerable research showing the impact of both traditional and digital marketing techniques. One of the strengths of this research is the range of methodologies employed (avoiding over-reliance on any one method), the rigour with which they have been employed, and the wide range of contexts in which research has taken place.

The research shows consistent effects across many HICs and growing evidence from LMICs. There are plausible mechanisms to explain how marketing impacts drinking behaviour via both simple exposure and building engagement, resulting in adverse impacts on young people and other vulnerable populations.

9.4 Current approaches to restricting marketing

A study of policies to combat **non-communicable diseases** (NCDs) in 151 countries has shown that government restrictions on alcohol marketing is one of the least well-enacted strategies (Allen *et al.* 2020). In addition to partial and complete bans on alcohol marketing, a third, non-governmental option has been industry self-regulation.

9.4.1 Response of vested interests: self-regulation

Vested interests (i.e. groups such as the alcohol industry that benefit the most from alcohol sales) have widely promoted alternatives to public health regulatory approaches. One such response is CSR messaging. Most companies have promotional messages on their websites and brand advertisements telling their customers to 'drink responsibly'. However, such messages are ambiguous, and studies have concluded that the seemingly pro-health messages can serve to subtly advance alcohol sales and public relations aims (Smith *et al.* 2006; Hessari and Petticrew 2017).

Other elements of alcohol industry messaging call into question the effectiveness of marketing regulation and promote industry-wide voluntary codes as an alternative (Savell *et al.* 2016). These codes, written and implemented by vested interests, aim to substitute 'self-regulation' for government regulation (see, for example, International Alliance for Responsible Drinking 2018). Evaluation of voluntary codes has shown poor compliance (Noel *et al.* 2017), inherent instability (Hill and Casswell 2004), and ineffectiveness in preventing exposure to potentially harmful content (Noel *et al.* 2017). Televised advertising retains its appeal to young people despite having been approved by systems relying on codes of content. Humour is an important aspect of many highly appreciated ads and is not generally covered by the codes (McCreanor *et al.* 2005). Research has also demonstrated the failure of voluntary codes, as applied to the digital media, to prevent objectionable and non-compliant content from appealing to youth (Barry *et al.* 2018).

In addition to controls on content, another common approach included in the voluntary codes is a pledge to limit exposure of younger people by not broadcasting or displaying ads to an audience where the proportion of underaged individuals exceeds a certain percentage (e.g. 30%). However, a restriction framed in terms of the percentage of young people in the audience does not prevent exposure of a significant number of young people (Jernigan *et al.* 2005; Pierce *et al.* 2019). For example, it was estimated that approximately 325 million youths aged under 16 years could have been exposed to alcohol marketing images during the 2014 FIFA World Cup games, most

of which (86%) had at least one violation in the industry's voluntary marketing code (Noel et al. 2017b).

Voluntary codes (and similar partial regulations) commonly include a watershed time, e.g. 9 p.m., before which alcohol advertising cannot be broadcast on television. Evaluation of such a policy in The Netherlands found that, while exposure to the youngest viewers was reduced, there was increased exposure for the high-risk teenage population (Ross *et al.* 2013). The expansion of digital alcohol marketing resulted in vested interests expanding their voluntary codes to include digital media, with a strong focus on eliminating exposure to young people under the legal purchase age (International Alliance for Responsible Drinking 2019). Studies of age gating on platforms such as YouTube, Twitter, and Instagram have shown the ineffectiveness of age verification technology (Noel *et al.* 2020).

9.4.2 Partial restrictions

In many jurisdictions, partial restrictions are imposed relating to specific media or specific beverages, and few have restrictions on digital marketing (Global Advertising Lawyers Alliance 2015).

France's Loi Évin was held up as a model of partial restriction reflecting its use of a positive list identifying venues and media in which marketing was permitted, rather than identifying those in which it was not, plus controls on content which prevented lifestyle advertising. Since its enactment in 1991, the Loi Évin has been progressively weakened by active lobbying from producers and retailers. In 2009, online advertising was allowed. According to one analysis (Gallopel-Morvan *et al.* 2017), by 2016, the law did not protect young people effectively from exposure to alcohol advertising in France.

Finnish legislation enacted in 2015 prohibited advertising of alcohol in games, lotteries, and competitions in any medium, including online. It also prohibited marketers from using any consumer-generated material in advertising and from creating material for peer-to-peer transmission (Montonen and Tuominen 2017). An evaluation showed there was no impact on Finnish brands' ability to engage with consumers (Kauppila *et al.* 2019), reflecting among other things failure to restrict use of like and share options.

Changes in advertising policy over the last century have also been evaluated using econometric analysis of APC consumption. However, the conclusions drawn from these studies are limited by the complexity and partial nature of the policy changes evaluated. For example, a study of APC in OECD (Organisation for Economic Co-operation and Development) countries between 1975 and 2000 created two dichotomous variables in which a ban on alcohol advertising on TV was used as an indicator of a complete ban and a ban on spirits advertising on TV was characterized as a partial ban. The author concluded there was no effect of a ban on alcohol advertising on APC (Nelson 2010). This analysis, which included some methodological problems, did not account for many other aspects of alcohol marketing and did not therefore evaluate a comprehensive ban. A further econometric study of OECD countries from 1970

to 1995, which used the number of media banning specific beverages or all alcohol ads, found an increase of one advertising ban could reduce APC by 5–8% (Saffer and Dave 2002).

Cross-sectional comparisons of diverse jurisdictions with different levels of restriction have all reported that less restriction of marketing was linked to higher consumption. This has been reported in relation to APC in a sample of 12 countries (Casswell *et al.* 2022) and in relation to survey data from schoolchildren in 84 countries (Noel 2019), from Latin American adolescents in 13 countries (Noel 2020), from individuals aged 18–65 in 15 LMICs (Cook *et al.* 2014), and from older European adults (Bosque-Prous *et al.* 2014). However, the direction of effect is not established in these cross-sectional studies because other conditions may account for both the lack of marketing restrictions and high levels of drinking.

9.4.3 Comprehensive bans

There are examples of complete bans on alcohol marketing in some Islamic countries, but the effects of their implementation or removal on alcohol consumption has not been evaluated.

Russia, which already implemented a ban on advertising in 1995, introduced a ban on alcohol advertising on the Internet in 2012. According to one study, there was a large decrease in aggregate consumption as a result of the ban (Matyusova *et al.* 2019), although the contribution of the marketing ban could not be differentiated from other policy changes in the same time period. Lithuania introduced a comprehensive ban in 2018, but this has not yet been evaluated. This ban similarly occurred along with other policy changes, as did the introduction of Thailand's fairly comprehensive restrictions as part of the 2008 Alcohol Control Act and the more recent partial restrictions on marketing included in Vietnam's alcohol control legislation in 2020.

Comprehensive bans in some of the Nordic countries have become more partial as they entered trade arrangements with the European Union and as digital marketing expanded without any restrictions. However, in Norway, a comprehensive ban remains in place and applies also to digital marketing. An interrupted time-series evaluation of the introduction of the ban in 1975 therefore provides an important contribution to this literature. It showed a 3% reduction in drinking prevalence by those aged 15–16 years and a 3% decrease in alcohol sales. When price and income were taken into account in an analysis of the period between 1965 and 2002, there appeared to have been a 7% reduction in alcohol sales following the ban (Rossow 2021a, b).

9.4.4 Estimated effects of alcohol marketing bans
from exposure studies

Estimates of the effect sizes of restrictions have been derived from observational studies of different levels of exposure to alcohol marketing in the United States, controlling for potential confounders among both adults and younger drinkers and using different outcome measures. A study of adults using databases of TV exposure to

alcohol ads suggested that every 1% increase in exposure over the past 12 months was associated with an 11% higher odds of drinking in the past month and a 5% increase in the number of drinks consumed (Niederdeppe *et al.* 2021). Among younger drinkers, a study comparing 24 different media markets from 1999 to 2001 showed an increase of 1% in drinks consumed for every additional advertisement and that alcohol use rose more sharply over time in markets with more alcohol advertisements. (Snyder *et al.* 2006). Exposure to TV alcohol advertising may also have larger effects at higher levels of exposure, with another study of younger drinkers suggesting that an increase of one standard deviation of exposure at the highest level was associated with an increase of 56 drinks in the past month (Naimi *et al.* 2016). Results from an analysis of magazine and television use suggested that a 50% decrease in average magazine and television exposure would result in a 3.3% decrease in youth drinking prevalence (Molloy 2016). Saffer and Dave (2006) compared regions with different levels of exposure and estimated that a 28% reduction in total advertising would reduce monthly underage prevalence of drinking and binging by 1% to 4%.

Data from a study of 15 LMICs (Cook *et al.* 2014) was used to estimate the cost-effectiveness of advertising restrictions. Based on the effect size of a 7% decrease in alcohol consumption resulting from increased restrictions, it was concluded that restrictions were a highly cost-effective policy (Chisolm *et al.* 2018). Similarly, estimates of the cost-effectiveness of a ban on advertising in a HIC, based on an estimated 4% decrease in consumption, found that the reduction in disability years of life lost would be greater than that from a 30% increase in taxation (Holm *et al.* 2014).

9.5 Lessons drawn from tobacco marketing bans

The experience of tobacco marketing bans is relevant to a consideration of the likely impact of a ban on alcohol marketing. Prior to the adoption of the World Health Organization Framework Convention on Tobacco Control (FCTC), comprehensive bans, but not partial bans, were found to reduce tobacco consumption in HICs and both comprehensive and partial bans reduced consumption in LMICs (Blecher 2008). In Brazil, the initiation of an advertising ban (as well as health warnings) was accompanied by a decline in smoking by young people (Galduróz *et al.* 2007). Marketing regulations in HICs were associated with significant reductions in smokers' reported awareness of pro-smoking cues which are known to promote smoking (Kasza *et al.* 2011).

Following the adoption of the FCTC, 22 countries adopted the highest level of tobacco advertising bans on all direct and indirect advertising. Effect sizes based on literature reviews and expert panels projected approximately 3.7 million fewer smoking-attributable deaths due to these measures (Levy *et al.* 2018).

Comparisons have been made between alcohol and tobacco marketing on the digital platforms, given that the FCTC calls for widespread, though not universal, restrictions on tobacco marketing. Comparisons suggest lower levels of tobacco than alcohol marketing. For example, the estimated exposure of British adults and adolescents to tobacco and alcohol content from popular YouTube music videos was around five times higher for alcohol than for tobacco (Cranwell *et al.* 2016). A systematic review of

digital marketing of unhealthy products found alcohol marketing had the most consistent adverse effects, whereas tobacco effects were inconsistent, perhaps reflecting stronger tobacco control policies in the countries surveyed (Buchanan *et al.* 2018).

9.6 Conclusions and policy implications

Alcohol marketing has changed markedly in the past decade. Integrated marketing campaigns, including digital media, have become a major focus for the alcohol industry. The expanded use of media that crosses national boundaries occurs in an internationally unregulated environment, in which digital trade clauses in international trade and investment agreements protect the opaque nature of the digital media (see Chapter 15). Increasingly, digital marketing is not only 'dark' because of the targeting employed, but also ephemeral because no record survives on some platforms. This, plus the data-driven business model that allows targeting of heavier drinkers, makes regulation of alcohol marketing via the platforms unlikely. The voluntary codes established by the vested interest groups are not effective in breaking the chain of marketing influence. Considerable resources are being employed by the TNACs to maintain markets in HICs and expand markets in LMICs.

Unlike tobacco, there is no international agreement to restrict alcohol marketing, but the evidence suggests this approach has reduced exposure to tobacco marketing. Bans on tobacco marketing can disrupt the cues that promote smoking and have been effectively translated to digital platforms. Both advertisers and platforms effectively prevent the circulation of advertising through digital channels in countries where legal restrictions exist, supported by Article 13 of the FCTC, which calls for comprehensive bans at the national level and under which a Protocol for a comprehensive ban on cross-border advertising, promotion, and sponsorship is in development (WHO Framework Convention on Tobacco Control 2018). Comparisons with tobacco marketing in the digital media suggest that the impact of marketing is far less for tobacco than for alcohol because of global and national restrictions on tobacco marketing.

The evidence shows that alcohol marketing speeds up the onset of drinking, increases the amount consumed by those already drinking, and is associated with problematic alcohol use. A dose–response relationship has been measured, and plausible neurobiological and psychosocial mechanisms identified. Fewer studies of digital media are available but show the same effects, and suggest the digital media may be more powerful. Marketing undoubtedly contributes causally to the ongoing recruitment of young people to replace drinkers lost to the industry by attrition, to respond to stabilization of consumption in mature markets, and to expand the drinking population in emerging markets. There is also evidence of the impact of marketing beyond young people, including those with already problematic drinking patterns. Identification of consumer characteristics in the digital media, such as a history of heavy drinking, allows for targeting of consumers to a far greater extent than has been possible previously.

It is more difficult to isolate the effect of marketing on the normalization of alcohol use, but marketing undoubtedly has a cumulative influence, as indicated by the results of longitudinal studies (Jernigan, *et al.* 2017). Commentators have suggested this may

Table 9.1 Consensus ratings of interventions designed to limit or ban alcohol marketing[d]

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Complete ban on alcohol marketing	++[c]	++	Few studies examined the direct effect of a total ban. However, there are extensive data showing the impact of alcohol marketing on drinking, particularly earlier initiation and heavier drinking among young people, and evidence of effectiveness for tobacco marketing bans. Despite extensive evidence of impacts and plausible mechanisms, the lack of evaluation of comprehensive bans limits the breadth of research support
Partial bans on alcohol marketing	+	+	Partial bans vary in the types of marketing addressed and the reach of the ban. While partial bans have been successful in limiting exposures on certain media and during certain times of the day, the ability to shift resources to unrestricted digital marketing suggests minimal effectiveness
Co-regulation and voluntary self-regulation codes	?	?	No research on the impact of voluntary codes on alcohol consumption and harm. A substantial amount of research has demonstrated that voluntary exposure guidelines and content codes are ineffective in preventing exposure and communication of persuasive messages

[a] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ Evidence of a strong effect on consumption or problems; ? one or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[b] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include LMICs; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in LMICs.

[c] This ++ grading on effectiveness reflects indirect evidence from effects of alcohol advertising on consumption, and evidence of effects of bans on tobacco advertising on consumption.

[d] For further information, please see 🗐 Online Appendix 1.

be one of the most powerful effects, which may explain the TNACs' steadfast opposition to any restrictions on marketing (Sargent and Babor 2020).

Table 9.1 provides a summary of the ratings of the interventions considered in this chapter. As described in 🗐 Online Appendix 1, they were rated by the authors in terms of evidence of effectiveness and amount of research support. In the case of alcohol marketing, the rarity of comprehensive bans and lack of evaluations means the

judgement of effectiveness is limited by its reliance on the evidence of the effects of marketing on alcohol consumption. The transfer of knowledge from the studies of tobacco marketing bans, which have shown bans do reduce exposure, was also taken into account.

The extent and breadth of research reviewed are considerable. The review utilizes a range of methodologies and is consistent in showing effects in experimental and observational studies. Given the strength of the evidence supporting a causal relationship between exposure to alcohol marketing and alcohol consumption, studies showing that marketing bans reduce exposure in comparable circumstances, and the results of the only available evaluation of a complete ban on marketing, it is reasonable to conclude that a policy preventing marketing exposure at the population level would reduce alcohol consumption both in the short term and over a longer time period. Based on effect sizes drawn from studies of different levels of exposure to advertising and modelling studies using these effect sizes, bans were estimated to be a very cost-effective intervention. Therefore a comprehensive ban on alcohol marketing is justified as a contribution to population health. The dominance of the global market by TNACs suggests only a coordinated international approach will achieve this.

The case for a complete ban on alcohol marketing is further strengthened by the lack of an alternative strategy. Table 9.1 shows that while partial bans can limit exposures on certain media and during certain times of the day, the industry's ability to shift resources to unrestricted digital marketing suggests minimal effectiveness. Similarly, voluntary self-regulation by industry, which is often combined with partial bans in an industry–governmental co-regulatory framework, has not been evaluated in terms of their impact on alcohol consumption and harm; however, there has been considerable research demonstrating their inability to restrict youth exposure and prevent the use of objectionable content. This suggests that voluntary self-regulation is not a viable alternative to a complete ban on alcohol marketing.

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10

Education and persuasion strategies

10.1 Introduction

Education and persuasion strategies are among the most popular approaches to prevention of alcohol-related problems. Even if drinking behaviour is normatively defined as a matter of personal choice for adults, it will be generally seen as legitimate for public health interests to encourage adults to avoid harm from drinking and to persuade children to postpone the initiation of drinking. Both public interest advertising campaigns and school-based education about alcohol are thus common and widely accepted, and there are well-developed literatures (though from a limited range of countries) evaluating their effects.

But education and persuasion in the public interest concerning alcohol usually do not exist in a vacuum; in many modern societies, commercial marketing to increase alcohol sales is a strong counterforce (see Chapter 9). From a commercial perspective, advertising and other promotion is an intrinsic cost of doing business, factored in when setting the product's sale price, and usually counted as deductible from net income in paying corporation taxes. The result is that both public health-oriented social marketing and alcohol education programmes are essentially **counter-advertising**[1] campaigns, competing for attention with a flood of alcohol promotions from commercial interests. Furthermore, often commercial interests have moved into the public interest space with **corporate social responsibility** (CSR) programmes (Mialon and McCambridge 2018), which may be essentially dressing an appeal for more sales of the product in a public interest costume (de Bruijn 2008) or may be aimed at persuading the public to look elsewhere than at the product for the source of the associated problems—as with the 'drink responsibly' slogan, widely used by transnational alcohol firms (Barry and Goodson 2010; Pantani *et al.* 2012; Jones *et al.* 2017) to point to the drinker as the source of any problems.

In this chapter, public health-oriented education and persuasion strategies are examined in several contexts and settings, including schools, colleges, and communities and the general population. While in some school-based programmes, the focus has been on alcohol, illicit drugs, and tobacco as a package, we focus here on outcomes that pertain to alcohol. The chapter is organized into four main sections: initiatives aimed at the consumer involving the media, school-based programmes, higher education-based programmes, and initiatives aimed at influencing policy choices on control of availability and promotion.

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

Strategies aimed at the consumer usually involve one or more of the following objectives: (1) changing knowledge about alcohol and risks related to drinking; (2) changing intentions to drink in order to lower risks; (3) changing drinking behaviour itself (e.g. delaying onset of drinking among youth); and (4) lowering the frequency or seriousness of problems related to drinking. In the analysis that follows, a specific intervention was considered to have a positive impact if evidence demonstrated that it was able to have some effect in preventing underage drinking, delaying the onset of drinking, or reducing the prevalence of high-risk drinking and alcohol-related harm. The strategies aimed at policy choices have a primary objective of changing public attitudes to increase support for alcohol policies (see Midford and Shakeshaft 2017; Reynolds *et al.* 2020).

10.2 Initiatives involving the media

10.2.1 Media health information campaigns

In response to the extensive promotion of alcoholic beverages in many countries, governments and private organizations have sponsored information campaigns. This has taken several forms, including **social marketing**, also called **public service announcements** (PSAs), and placement of warning messages on actual advertisements. These social marketing messages are prepared by governments, non-governmental organizations, health agencies, and media organizations for the purpose of providing important information for the benefit of a particular audience. In some cases, PSAs depend upon donated time or space for distribution to the public. Messages in PSAs from official agencies are often constrained by pressures from those with an economic interest in alcohol sales. Alcohol industry firms—and social aspect organizations funded by them—also actively produce social marketing campaigns, with messages often advocating **responsible drinking**.

Counter-advertising involves disseminating information about a product, its effects, and the industry that promotes it, in order to decrease its appeal and use. It is distinct from other types of informational campaigns in that it directly addresses the fact that the particular commodity is promoted through advertising (Agostinelli and Grube 2002).

Social marketing or PSAs use a number of media vehicles—television or radio, paid or required counter-advertisements, billboards, magazine and newspaper pieces, and news or feature stories on television and radio—in order to provide information about the risks and complications associated with drinking. With the advent of digital and social media, the concept has been expanded to 'social counter-marketing' (Bellew *et al.* 2017). While the aim is for these messages to have a direct effect on the behaviour of the target audience, this is seldom accomplished. Tactics include health **warning labels** on product packaging and **media literacy** efforts to raise public awareness of the advertising tactics of an industry, as well as prevention messages in various media channels. Young and colleagues (2018) assessed the effectiveness of mass media messages to reduce alcohol consumption and related harms. They reviewed 24 studies of campaigns mostly conducted in **high-income countries** (HICs). While mass media

campaigns about alcohol often were recalled by individuals, and exposure to campaigns was associated with increased knowledge about alcohol, there was little evidence of reductions in alcohol consumption. In another systematic review of alcohol mass media campaigns, Stead *et al.* (2019) found evidence that alcohol-related knowledge increased, including about cancer risk and risk of alcohol use during pregnancy; however, evidence of impact on alcohol use was limited. They also evaluated the evidence in other health areas and found mixed impact on tobacco use and physical activity and no impact on illicit drug use.

Previously, the number of alcohol PSAs and counter-advertisements were at best a small fraction of the total volume of alcohol advertisements (see Wyllie *et al.* 1996). Moreover, the content of information campaigns cannot easily challenge the other persuasive, and often subtle, influences supportive of drinking, for instance on social media. One solution to the imbalance with the number of pro-alcohol advertisements has been to require pro-alcohol advertisements to be accompanied by a warning counter-message. Although legislative initiatives to place warnings directly on alcohol advertisements never succeeded in the United States (Giesbrecht 2000), by 2016, about one-third (56) of the 164 countries responding to a World Health Organization (WHO) questionnaire on alcohol policies reported that they required warning messages on advertisements for alcoholic beverages (World Health Organization 2018, p. 112). French alcohol advertisements have been required since 1991 to carry the message 'alcohol abuse is harmful'; alcohol advertisers customarily add to that their own message: 'consume with moderation' (Dossou *et al.* 2017). Billboard advertisements in Mexico carry general warnings to use alcohol with caution. Newspaper advertisements in Sweden are required to carry one of 11 rotating warnings in sufficiently large type to occupy one-eighth of the advertisement (Wilkinson and Room 2009). There has been little study of the effects of such requirements. A qualitative study of the French warning message found little effect, possibly because of its small size and lack of visibility (Dossou *et al.* 2017).

Counter-advertising has intuitive appeal and may be a more realistic political option than seeking a ban on alcohol advertising (Saffer 2002). The tobacco experience in the United States included hard-hitting counter-advertising programmes with messages such as 'Cigarette companies are making a killing off you.' Such programmes can be effective as part of a comprehensive prevention strategy (Rohrbach *et al.* 2002). However, there are limitations on the extent to which the confrontational stance in the tobacco control experience can be transferred to the alcohol context. Alcohol counter-advertising typically does not offer powerful outcomes within realistically available budgets.

Drinking in high-risk situations, such as pregnancy or driving, has commonly been the focus of mass media campaigns. A systematic review of 19 studies of campaigns to reduce drink-driving from five countries (13 from the United States) found an 8% reduction in the outcome measure when there was accompanying enforcement, though puzzlingly a 15% reduction with no enforcement (Yadav and Kobayashi 2015). However, none of the studies attained the rating of being a 'good' quality study, and summary effects calculated from seven studies showed no evidence of media campaigns reducing the risk of alcohol-related injuries or fatalities. On the other hand, a study from Ethiopia found significant positive effects on knowledge, attitudes, and

drink-driving behaviour (Negi *et al.* 2020). Effects of mass media campaigns to reduce alcohol consumption in pregnancy have mainly found improvements in knowledge, but no significant impact on alcohol consumption (Crawford-Williams *et al.* 2015).

10.2.2 Warning labels

In 2016, 47 countries responded to a WHO questionnaire that they mandated health warning labels on bottles or containers of alcoholic beverages (World Health Organization 2018, p. 112). In a few more countries (e.g. China and Japan), such health warnings are voluntary (Wilkinson and Room 2009; Martin-Moreno *et al.* 2013). The content of warning labels varies among countries. In France and Australia, the emphasis is solely on risks from drinking during pregnancy, while in South Africa, warning labels must contain at least one of seven health messages (including risks of personal injuries and addiction) (Wilkinson and Room 2009; Martin-Moreno *et al.* 2013). The **transnational alcohol corporations** have moved to include in international trade agreements restrictions on national requirements for warning labels on containers, seeing such requirements as restricting their use of the valuable 'real estate' on the label for their promotional material (O'Brien *et al.* 2018; see Chapter 15).

There is evidence that warning labels impact knowledge, awareness, intentions, and perceptions (Wilkinson and Room 2009; Scholes-Balog *et al.* 2012; Thomas *et al.* 2014; Schoueri-Mychasiw *et al.* 2021), but evidence on effects on drinking behaviour has generally been equivocal. Recent reviews (Wilkinson and Room 2009; Knai *et al.* 2015) conclude that warning labels generally have a limited immediate impact on drinking and risk behaviour. In a review of studies on alcohol and pregnancy labels, Thomas et *al.* (2014) found limited effect on alcohol consumption among pregnant women. Correspondingly, Scholes-Balog *et al.* (2012) concluded that among adolescents, exposure to warning labels is unlikely to change drinking behaviours or beliefs about alcohol-related risks. However, a later study (Zhao *et al.* 2020) found that the rotating warning labels adopted for a time in Yukon Territory, Canada did have an effect in reducing alcohol sales (see Box 10.1). And warning labels on tobacco products have been found to promote smoking cessation and prevent smoking initiation (see Wilkinson and Room 2009; Scholes-Balog *et al.* 2012 for reviews).

The studies we have cited of the effects of warning labels have focused on their more or less immediate effect in changing drinking behaviour. The implicit picture of the effect is of a potential purchaser picking up a bottle in a liquor store or raising it to fill his or her glass, seeing the warning on the label, pausing and thinking, and putting the bottle back down. Or perhaps, in a slightly longer time frame, having a discussion about drinking with a child who has read the label on a bottle in the family refrigerator. Such a model of effect is appropriately tested in the relatively short time frame of conventional before/after studies. However, there is another potential function of a government-mandated warning label—it sets it apart from other commodities as a dangerous or problematic product. This shifts the cultural position of the commodity (Room and Mäkelä 2000)—a change away from unthinking acceptance in everyday life to a more arms-length and balanced consideration, analogous to tobacco's shift away from its former positioning as a safe product. This dimension of cultural

Box 10.1 Warning: the alcohol industry could be harmful to health warning research

Public health scientists at the Canadian Institute for Substance Use Research and Public Health Ontario conducted a series of studies that are highly relevant to alcohol labelling policy, labelling research, and prevention theory. The investigators designed a set of messages that included: (1) a cancer warning (see Figure 10.1);

Figure 10.1 Cancer warning label applied to alcohol containers in research study conducted in the Yukon Territory, Canada.

(2) low-risk drinking guidelines; and (3) standard drink messages. They then tested their effects in several communities in northern Canada. The intervention site applied labels with the messages to alcohol containers in its government liquor store, whereas the comparison sites did not. Compared with control sites, per capita sales of labelled products declined by 6.6% in the intervention community (Zhao *et al.* 2020). Liquor store customers' recall of all three messages increased to a greater extent in the intervention sites vs the comparison sites (Hobin *et al.* 2020). For example, awareness of the drinking guidelines increased from 30.7% pre- to 67.0% post-intervention (Schoueri-Mychasiw *et al.* 2020).

Another direction taken in this research was initiated quite unexpectedly when alcohol industry representatives pressured the Yukon government to temporarily shut down the research project because of objections to the cancer warnings. Media coverage of the interference only served to heighten public support for warning labels and customer awareness of the well-documented alcohol–cancer link (see Chapter 4) (see also Vallance *et al.* 2020a). The research was able to continue, albeit with some modifications imposed by the industry. Despite this interference, enough data were collected to make the reports referenced above possible (Stockwell *et al.* 2020).

In a similar fashion, industry complaints in South Korea helped to weaken the country's implementation of cancer warning labels, and in Ireland, cancer warnings faced continuing legal opposition expressed through regional and global bodies (Vallance *et al.* 2020b).

This set of interrelated studies shows that highly visible labels with impactful messages may be an effective population-level strategy for increasing knowledge of national drinking guidelines, promoting awareness of cancer risks, and decreasing alcohol purchases. The research also shows that scientific research on warning labels can be a contentious issue when it involves 'a consumer's right to know, a government's responsibility to inform, and an industry's power to thwart' (Stockwell *et al.* 2020).

positioning of alcohol, which is only likely to occur over a considerable time period, cannot be measured in the time frame of conventional evaluation studies, so evidence on the extent to which there is such an effect is lacking.

10.2.3 Low-risk drinking guidelines

A number of jurisdictions in high-income countries (HICs) have disseminated low-risk drinking guidelines. Given the complex considerations that underlie any such guidelines, it is not surprising that the guidelines initially varied considerably from one country to another (Kalinowski and Humphreys 2016), although there are signs of convergence toward relatively low limits (e.g. National Health and Medical Research Council 2020). There is little research on the impact of these messages (Knai *et al.* 2015). However, when the Australian 2009 guidelines halved the guidance on

maximum quantity per occasion for males, bringing it to the same level as for women, there was a greater downward shift for men than for women in how much respondents in national surveys thought someone of their gender could drink without putting their health at risk (Livingston 2012). Whether through the new guidelines themselves or from public attention and controversy as they were put out for comment and adopted (Wilkinson 2012), there was a change in opinions on the limits for low-risk drinking. A quasi-experimental study of alcohol warning labels that included both low risk guidelines and standard drink information (Hobin *et al.* 2020) (see Box 10.1) showed that enhanced alcohol labels are noticed and may be an effective population-level strategy for increasing awareness and knowledge of low-risk drinking guidelines.

It is unclear whether such messages should be expected to lead to an overall decrease in alcohol consumption and related problems (Casswell 1993). For example, guidelines may be misinterpreted by the public and could lead some abstainers to taking up drinking and influence moderate drinkers to drink more. It may be argued that disseminating low risk guidelines is an appropriate consumer information action, but there is little evidence on their effect on consumption or problems.

10.3 School-based and other youth education programmes

Prevention initiatives focusing on adolescents and school-based **alcohol prevention programmes** have several goals: to increase knowledge and awareness about alcohol in adolescents (Cuijpers 2003); to change the adolescent's drinking beliefs, attitudes, and behaviours; to modify factors such as general social skills and self-esteem that are assumed to underlie adolescent drinking (Paglia and Room 1999); to delay the onset of first use of alcohol; to reduce the use of alcohol; to reduce high-risk drinking; and to minimize the harm caused by drinking (see Cuijpers 2003). In school settings, programmes with a **universal prevention strategy** typically include alcohol awareness education, social and peer resistance skills, normative feedback, or development of behavioural norms and positive peer affiliations (Foxcroft and Tsertsvadze 2012). However, there is considerable variation in age of the target group (from 5 to 18 years) and programme duration (from a single session to 3 years) (Foxcroft and Tsertsvadze 2012). There are also school-based alcohol education programmes sponsored by the alcohol industry, such as Smashed, which is widely used but lacks independent evaluation (Jackson and Dixon 2020).

A number of systematic reviews of randomized controlled trials of school-based prevention programmes have been published over the past decade. Foxcroft and Tsertsvadze (2011a) found that more than half (29/53) of the trials reported no effects on alcohol use or related problems, while 21 trials reported statistically significant effects on one or several outcomes. Among the 39 trials that evaluated generic prevention programmes, 24 trials did not find statistically significant effects on alcohol use or related problems, while 15 trials did. Those based on psychosocial or developmental approaches (life skills, social skills and norms, or development of behaviour norms and peer affiliation) were more likely to report effects over several years. It is, however, unclear why some prevention programmes seem to work in some settings and not in others (Foxcroft and Tsertsvadze 2011a).

A meta-analysis of reported outcomes measured on a continuous scale showed a small overall favourable effect from preventive interventions up to 1 year after programme implementation, whereas the **effect size** for categorical outcomes was not statistically significant. Lee and co-workers (2016) reviewed 70 studies of 40 individual school-based alcohol education programmes. They found that three of these programmes had good evidence of a positive effect; for 29 programmes, the evidence was inconclusive, and two programmes showed negative outcomes. A further systematic review of 16 studies also reports mixed findings (Dietrich *et al.* 2016), commenting that its findings highlight that the majority of school-based programmes use a 'one size fits all' approach, rather than adapting their messages for different segments among students.

Hodder and colleagues (2017) reviewed universal school-based 'resilience' interventions for a broader spectrum of substance use (alcohol, tobacco, or illicit drugs) among adolescents. They identified 17 randomized controlled trials that reported alcohol use outcomes, and found no overall intervention effect for alcohol use.

As use of substances (alcohol, tobacco, illicit drugs) and other risk behaviours often co-occurs among adolescents, some universal school-based programmes aim at preventing multiple risk behaviours. In a systematic review of randomized controlled trials of such programmes, MacArthur and colleagues (2018) conducted a meta-analysis of eight studies reporting alcohol use outcomes. They found less alcohol use among those exposed to school-based interventions that target multiple risk behaviours, as compared to those exposed to usual practice (or no intervention).

Since the early 2000s, universal prevention programmes have been adapted to digital platforms. As the vast majority of adolescents in many parts of the world are extensive Internet users, eHealth interventions (prevention programmes via the Internet on computers, mobile phones, etc.) can be delivered in school settings. Some of these programmes are thus school-based. Compared to traditional prevention programmes, eHealth programmes offer several potential advantages, including increased fidelity and scalability (Champion et al. 2016). In a systematic review, Champion and colleagues (2013) found four trials of alcohol and other drug programmes including alcohol, and found in all four a reduction in alcohol use of 'modest effect size'. In a later systematic review of 22 studies reporting on trials of 16 universal online prevention programmes, Champion *et al.* (2019) included four studies with an element focusing on alcohol but found no effect on alcohol behaviour in any of them. We may tentatively conclude that this prevention modality is worth further study but so far has shown only limited promise.

While school-based alcohol prevention efforts have tended to be applied generally and non-selectively (universal in scope), research suggests that targeted (**selective** and **indicated prevention**) approaches are more effective. A meta-analysis of 161 school-based prevention programmes found relatively small effects for both approaches but concluded that targeted programmes (effect size −0.13, 95% confidence intervals −0.18, −0.09) were more effective than universal programmes (effect size −0.08, 95% confidence intervals −0.10, −0.05) in preventing or reducing alcohol misuse among adolescents (Lammers *et al.* 2019, p. 34). Young adolescents who had already begun to drink alcohol at an early age appeared to benefit most from targeted prevention strategies. Other at-risk groups who appeared to benefit more from targeted prevention

programmes included adolescents with specific personality traits (see also Edalati and Conrod 2019 for a review) or problem behaviours. However, there is some variation in results between studies. An Australian study comparing results from programmes with a universal, a selective, and a combined approach found that the universal-only programme had the strongest effect (Teesson *et al.* 2017).

The elevated risk of early or heavy substance use, including alcohol, in Indigenous minority populations (see Chapter 3) has led to the development of prevention programmes that specifically target adolescents in these populations. Reviewing evaluation studies of such programmes in Australia, Canada, and the United States, Snijder and colleagues (2020, Appendix Table 3) found that five out of nine studies reported some beneficial effect on alcohol use and one study reported adverse effects. In the programmes evaluated, cultural enhancement and skill acquisition were common. However, no specific programme components appeared to increase the likelihood of a beneficial programme effect.

10.4   Family-inclusive and community-based education and intervention programmes

Some programmes include both individual-level education and family-level or community-level interventions. Parent-based programmes to prevent alcohol use in children may have beneficial effects on parent skills and behaviour (Kuntsche and Kuntsche 2016; Hurley *et al.* 2019). Newton and colleagues (2017, Table 1) reviewed publications from ten trials of combined universal interventions for students and their parents which aimed to prevent or reduce alcohol use. The results were mixed, with three programmes showing fairly uniform beneficial effects in terms of delaying or reducing adolescent alcohol use, three showing no significant effects, and four in which some results for alcohol were significant and others not. An earlier systematic review by Foxcroft and Tsertsvadze (2011b), with some overlap in included studies, examined effectiveness of universal multi-component programmes for alcohol prevention in young people, which typically combine school-based and parent-based intervention. While 12 of these trials showed some evidence of effectiveness both in the short and longer term, seven of the trials found no significant effect, and in one, the effect was marginal. Seven of the trials assessed whether there was an additional benefit of multiple components vs just a school, family, or community component; only one showed a clear benefit from multiple components.

10.5   Conclusions, limitations, and challenges: school and community education programmes

A number of meta-analyses, as well as narrative and systematic reviews, have been published in recent years, evaluating hundreds of youth-oriented education or intervention programmes where alcohol was a primary focus or included among the substances examined. Several themes emerge from this literature. First, while the adolescent population is the central focus of the original studies, a number of the interventions extend their scope beyond the classroom to include community-based settings

and institutions, and involve families and parents in the intervention programmes (Emmers *et al.* 2015).

Second, the beneficial effects reported from evaluation studies may provide an overly optimistic picture of the interventions' capacity for success (Pape 2009; Gorman 2015). Most evaluation studies are conducted under optimal conditions, whereas in reality, with broader programme dissemination, teachers and other programme deliverers often fail to implement the programme as intended, which, in turn, implies less likelihood of beneficial programme effects (Pape 2009; Ennett *et al.* 2011). Another issue is the problem of publication bias and outcome reporting bias, which leads to overestimation of positive intervention effects (Dwan *et al.* 2008), since results for programmes where the finding is of no effects or even effects opposite to those intended are less likely to be published (McCambridge 2007; Rossow and Pape 2008; Pape 2009). In this field of work, programme developers very often evaluate their own programmes (Gandhi et al. 2007), and they could therefore have financial or other interests in selecting whether to report and which results to report. Another problem is insufficient methodological rigour and flexible data analysis, which may have tilted results to the more favourable side (Gorman 2015).

Third, some analysts have noted that the promotion, marketing, and dissemination of some interventions appear unrelated to the evaluation findings. In the United States, federal policy has, since 1998, explicitly required 'evidence-based' prevention programmes in schools. School districts are recommended to select evidence-based prevention curricula from 13 different lists of numerous programmes. In their review of the best-known lists, Hallfors and co-workers (2007) noted several concerns. For example, for most lists, the 'evidence' of programme effectiveness may have come from a single small efficacy trial by programme developers.

Fourth, most of the studies focus only on effects on the student, even where attention is paid to alcohol-related harms. The Australian study reported by McBride *et al.* (2004) stands out in this respect, in reporting on effects on harms to others as an outcome.

The reviews typically show that providing information is not sufficient on its own to delay initiation of alcohol use or to prevent alcohol-related problems. But it would appear that many such programmes continue to be implemented, apparently based on the assumption that providing information will somehow change behaviour patterns. On the other hand, programmes with multiple interactive components and those that reach beyond the classroom seem to have some potential, though it is not clear whether they should be described as 'education'. Education may be part of such programmes, but their 'selective' or 'indicated' foci, combined with components that resemble family therapy or screening and brief intervention, may be the most potent components. In general, prevention programmes seem more successful when they maintain intervention activities over several years and incorporate more than one strategy.

10.6 Programmes in higher education institutions

Interventions directed at alcohol use in college and university settings have been developed, particularly in North America, in response to concerns about the extent of heavy drinking, its relation to sexual assaults, and its impact on school performance,

drink-driving, and other alcohol-related problems (Dietz *et al.* 2020). Large-scale surveys of college students in the United States (Schulenberg *et al.* 2019) have documented the extent of drinking and alcohol-related risks. On average, undergraduate university students drink more than other Americans of the same age (Schulenberg *et al.* 2019, pp. 433–45, 463–6).

The research literature on preventive interventions with college and university students is dominated by studies from the United States—80% of the 164 studies included in the meta-analysis by Tanner-Smith and Risser (2016), for instance, are US studies. But US undergraduate experience has some special characteristics. US undergraduates commonly leave the parental home to attend university—only 27.5% stay on living with their parents (Kelchen 2018), and the daily behaviour of a strong majority is thus outside immediate family control. And the majority of undergraduate students are below the US legal drinking age of 21, whereas an age of 18 is the most common minimum age limit in most other countries (World Health Organization 2018, p. 103). US college and university programmes are thus conducted under different circumstances, and often with different messages, than would be applicable elsewhere.

In their umbrella review, Dietz and colleagues (2020) identified 14 review articles that investigated the effectiveness of strategies to reduce alcohol use among students. Overall, this review of reviews suggested that both face-to-face programmes and Internet-based approaches show promising results in reducing drinking behaviour, but findings were mixed and there was no evidence of long-term effects. Studies of alcohol education and persuasion in populations of higher-education students are common enough that a whole second level has emerged of systematic reviews and meta-analyses looking quantitatively across the studies. One study, for instance, examined 41 studies, with a total of 62 alcohol interventions on first-year college students, finding on average small reductions in quantity and frequency of drinking, but no effects on frequency of heavy drinking or on drinking problems (Scott-Sheldon *et al.* 2014). A meta-analysis of 24 trials of brief motivational interventions (BMIs) found a small effect for the combination of BMI with personalized feedback about the respondent's drinking, but no significant overall effect of BMIs without feedback on any drinking at follow-up or on the amount consumed per occasion, or on peak occasions (Huh *et al.* 2015). Studies with selective or indicated subpopulations of heavier drinkers found greater effect of computer-based interventions, but with small effect sizes—a reduction in weekly consumption of 16–24 grams of ethanol (1–2 drinks), with the effect decaying over time (Sundström *et al.* 2017). A meta-analysis of 31 studies, involving 68 interventions, where alcohol education or counselling had been 'mandated' as part of disciplinary action for violating campus policies, found no effect at all from alcohol education, but that goal-setting, expectancy challenges, and personal feedback did result in lower consumption and fewer alcohol problems, though the effects decayed over time (Carey *et al.* 2016). On the other hand, a review of 15 studies, with 21 alcohol interventions, in campus fraternities—usually residences on-campus with heavy drinking traditions—found little evidence of effect (Scott-Sheldon *et al.* 2016). This suggests that, while the effects of education and counselling may be marginally stronger where those receiving it are selected as individuals, this is less likely to be true where the selected target is a group committed to norms of heavy drinking.

The general finding from mostly US-based studies of programmes in higher education institutions is that some effect may be found, but that it is generally small. One meta-analysis, for instance, calculated a reduction of 0.37 drinks per week (Samson and Tanner-Smith 2015). Whether or not the results constitute 'substantive, meaningful benefits' has been the subject of some debate (Foxcroft *et al.* 2016; Grant *et al.* 2016).

Perhaps reflecting these conclusions, recent prevention efforts in the United States have moved away from purely individual-oriented college alcohol prevention programmes to also encompassing environmental controls on alcohol availability and marketing. Thinking about alcohol prevention in an institutional environment has also moved on to complex systems approaches, taking account of alcohol policies, college environment and culture, and student interpersonal influences (Apostolopoulos *et al.* 2018). The US National Institute on Alcohol Abuse and Alcoholism has put forward a College Alcohol Information Matrix (CollegeAIM) tool which synthesizes the literature and includes environmental, as well as individual, strategies (Cronce *et al.* 2018). Typically, in such programmes a combination of strategies is used, including persuasive measures, staff training, guidelines, regulations, voluntary arrangements pertaining to alcohol marketing, restrictions on location of outlets, and campus alcohol policies.

10.7 Building support and advocacy for health-oriented policies

Education campaigns can be used as a tool to build support for public health-oriented policies, as indicated by studies conducted in New Zealand (Casswell *et al.* 1989) and Norway (Rise *et al.* 2005). The New Zealand study concluded that a mass media campaign focusing on alcohol advertising and availability created a climate in support of policies likely to shape appropriate drinking behaviours in the community (Casswell *et al.* 1989). The goals of the Norwegian information campaign (Rise *et al.* 2005) were to increase knowledge of the harm related to alcohol consumption, increase awareness of the utility of restrictive alcohol policies, and provide advice on how to communicate about alcohol with children. Changes in three areas were found following the campaign: more positive attitudes toward the use of effective alcohol policy measures; more positive attitudes toward parental monitoring of children's alcohol consumption; and more restrictive parental behaviour in relation to their children. Two other studies have found that increasing knowledge that alcohol is a risk factor for cancer is associated with increased support for alcohol control policies (Bates et al. 2018; Weerasinghe *et al.* 2020).

In the later 2010s, there was also a move in several countries toward recruiting and training community advocates for public health-oriented alcohol policies. In Scotland, local public health practitioners took on new roles, tackling the issue of 'overprovision' of alcohol by 'building positive working relationships with licensing actors' (Fitzgerald *et al.* 2017). Ramirez and Jernigan (2017) analysed three case studies in the United States of attempts to increase state alcohol taxes, finding that factors contributing to success included drawing on research and polling data, building on past experience,

and forming coalitions. In preparation for an effort to mobilize communities to address alcohol-related harm, a review of research published since 2000 of relevant efforts in England found 30 studies with some relevance, but only one describing community engagement in alcohol licensing (McGrath *et al.* 2019). A research project in Greater Manchester—Communities in Charge of Alcohol (CICA)—is engaged in a trial of an Alcohol Health Champions programme (Cook *et al.* 2018), an 'asset-based community development approach to reducing alcohol-related harm' by 'training lay people to offer brief advice and take action on licensing decisions'. Eighteen months into the project, 123 'champions' had been trained (Ure *et al.* 2020).

A variation in community advocacy, drawing on case studies of previous efforts (Room *et al.* 2021), has been pursued by VicHealth, the state's health foundation in Victoria, Australia. The programme aims at influencing drinking patterns in heavy-drinking 'social worlds'—groups sharing a common occupation, interest, or social position, where relatively heavy drinking was accepted and indeed often encouraged as part of their socializing (VicHealth 2019; MacLean *et al.* 2021). Various agencies in the state—municipal authorities, university student welfare department at universities, and community agencies—have been funded to work with particular heavy-drinking social worlds to limit risky drinking and alcohol problems (e.g. Roberts *et al.* 2019).

10.8   Conclusion

As described in ⊜ Online Appendix 1, the strategies and interventions reviewed in this chapter were rated by the authors in terms of evidence of effectiveness and amount of research support, also taking into consideration population reach and relative cost of the intervention to governments. Table 10.1 provides the authors' consensus ratings for the interventions in this chapter with a proximal goal of reducing alcohol consumption levels or alcohol harms. As we have noted, there are substantial evaluative literatures for many of the interventions; the three pluses in the 'Breadth of research support' column of the table for some interventions often reflect multiple systematic reviews. On the other hand, the bulk of the evaluation studies have been done in a relatively narrow range of countries; it cannot be taken for granted that the effectiveness rating for a particular strategy will apply generally.

Table 10.1 Consensus ratings of education and persuasion strategies and interventions[e]

Policy[a]	Effectiveness[b]	Breadth of research support[c]	Comments
Public service announcements and mass media campaigns	0	+++[d]	Mostly studies in HICs; knowledge improvement, but no impact on alcohol use. Marketing spend for pro-alcohol advertising and promotion far exceeds the small sums devoted to PSAs and media campaigns
Anti-drink-driving campaigns	+	+++[d]	Apparently reduce alcohol-impaired driving, but not casualties

Table 10.1 Continued

Policy[a]	Effectiveness[b]	Breadth of research support[c]	Comments
Warning labels	+/0	++	Affect knowledge and intentions; one study showed an effect on consumption
Low-risk drinking guidelines	?	+	Affect knowledge and awareness of risks
Universal school prevention programmes	+/0	+++	Studies vary in the extent to which an effect was found; effect sizes tend to be small
Online prevention programmes	+/0	++	Half of trials showed modest effects, half none
Targeted prevention programmes	++/+	++	Effects found for early users and those with problematic behaviours. Some effects of targeted programmes on Indigenous minority youth. High heterogeneity across studies
Family-inclusive education and intervention	+/0	++	Some programmes involving parents, as well as youth, affected youth drinking. High heterogeneity across studies
Alcohol interventions with undergraduate students	+	++	Mostly US studies. Small reductions in quantity and frequency of drinking, but no effects on frequency of heavy drinking or on drinking problems
Brief motivational interventions (BMIs) in school settings	0/+	++	Mostly US studies. No effect of BMI alone; small effect when used with personalized feedback
Computer-based interventions with selective subpopulations of heavier drinkers	++/+	++	Moderate effects, but effects decay over time
Mandated education or counselling in college fraternities	0	++	No effect of education alone, but goal-setting and personal feedback have effects, though effects decayed over time

[a] Studies of building community support and advocacy for policies are not included in this table, since their proximal goal is not to impact directly on alcohol consumption or harms.

[b] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ Evidence of a strong effect on consumption or problems; ? One or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[c] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include LMICs; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in LMICs.

[d] A systematic review comprising studies of varying quality, mainly poor. Only a few included studies of good quality.

[e] For further information, please see ☰ Online Appendix 1.

In recent years, the number of informational and educational programmes has grown exponentially. In the 1990s, alcohol education or persuasion was largely at the individual level, directed at changing individual drinking and related behaviour, with the main effort directed at schoolchildren and college students. Despite an extensive research literature and many attempts at innovative programming, the research suggests that for most of the universal programmes the impact on alcohol use is minimal or has not yet been demonstrated, and only modest effects can be expected from some of the targeted interventions.

More recently, there has been attention to persuasion at interactive and community levels. This expansion of the focus recognizes the collective nature of much drinking, the influence of the immediate environment, and local controls on drinking and associated behaviour. It also recognizes that the policy process and social environment, as well as individual behaviour, are appropriate targets for public health-oriented education and persuasion.

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11

Drinking and driving: prevention and countermeasures

11.1 Introduction

Although there have been significant gains in road traffic safety, especially in **high-income countries**[1] (HICs), motor vehicle crashes remain a major public health issue. In 2016, as many as 1.35 million people died worldwide from traffic crashes (World Health Organization 2018a). Overall, in 2016, road traffic injuries accounted for 2.5% of all global deaths and ranked 8th as a cause of death.

Alcohol is a major risk factor for traffic fatalities and injuries. The importance of alcohol as a risk factor for deaths and injuries is highlighted in the World Health Organization (WHO)'s Global Status Report on Road Safety 2018 (2018a) and by its inclusion of United Nations Sustainable Development Goal 3.6 for Road Safety: 'by 2030, halve the number of road traffic injuries and fatalities related to drivers using alcohol' (World Health Organization Europe 2020, p. 4). Globally, about 27% of traffic crash deaths were attributable to alcohol in 2016 (World Health Organization 2018b), translating to around 370,000 alcohol-attributable deaths due to road injuries worldwide (World Health Organization 2018c). The proportion of alcohol-related traffic crash deaths ranges from 1.7% in the Eastern Mediterranean WHO region to 37.7% in the European region (World Health Organization 2018d). Alcohol-attributable traffic crash deaths also vary by country. In Muslim-majority countries, alcohol-attributable traffic deaths range from less than 0.1% to 17%. In HICs, about 40% of traffic crash deaths are attributable to alcohol among males, and 20% among females. In **low- and middle-income countries** (LMICs), these proportions are 26% and 18%, respectively (Global Information System on Alcohol and Health 2016).

This chapter describes the relationship between drinking and driving, and how an understanding of that association can be used to design countermeasures that prevent alcohol-related injuries and death. Much of the evidence comes from the United States and a few other HICs. Statistics from LMICs may look different. Risk of death due to a traffic crash is more than three times higher in low-income countries than in HICs (World Health Organization 2018a). The conjunction of drinking and driving is also more problematic in LMICs, as the interaction between alcohol use and other

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

conditions such as poorer roads, higher traffic density, and number of passengers is more pronounced. Such interactions have policy implications that will be discussed later in the chapter.

11.2 Blood alcohol concentration and driving performance

Blood alcohol concentration (BAC) refers to the amount of alcohol present in the blood of a drinker. It is usually measured in terms of mass per volume. For example, a BAC of 0.02% means 0.02 grams of alcohol per 100 grams of an individual's blood. The amount of alcohol consumed is the most important influence on BAC, but it also depends on other factors such as an individual's weight, rate of drinking, and presence of food in the stomach (Mumenthaler *et al.* 1999; Ogden and Moskowitz 2004). Objective measurement of BAC has made it possible to study dose–response relationships between alcohol and impairment, and has also contributed to advancements in drink-driving policies. There is a well-established link between consuming alcohol prior to driving and impaired driving. Driving skills are increasingly impaired in accordance with the number of drinks consumed before driving, with decrements in performance starting with the second drink (World Health Organization 2018a). The reaction time of drivers increases with an increase in BAC levels (Yadav and Velaga 2019), and at a BAC of 0.05%, judgement and reaction times are impaired, as is driving performance (Brown *et al.* 2018). At a BAC of 0.10%, voluntary motor control is substantially diminished (Davis *et al.* 2003). Table 11.1 shows the relative risk of driver involvement in fatal crashes, according to different age groups.

Overall, crash risk increases exponentially with BAC. However, even at very low levels (e.g. BAC of 0.015%), a driver's ability to divide attention between two or more sources of visual information may be impaired (Ogden and Moskowitz 2004). At a BAC of 0.80–0.99%, the relative risk of a fatal crash ranges from 6.89 to 12.61, depending on age, with younger drivers having a higher risk, compared to older drivers (Voas *et al.* 2012). Not only does alcohol increase the risk of crash, it can also increase crash severity. Thus, crashes in which at least one driver had been drinking are more likely to be fatal or result in severe injuries than non-alcohol-involved crashes (e.g. Zador *et al.* 2000; Moskowitz *et al.* 2002). Typically, male drivers are about 1.5 times more likely to be involved in alcohol-related fatal crashes than are female drivers, and the contribution of alcohol to such crashes peaks among US drivers in their early 20s (National Highway Traffic Safety Administration 2008).

Importantly, drinkers who consume relatively large amounts on only some occasions may be at increased risk of involvement in alcohol-related crashes, compared to other drinkers (Gruenewald *et al.* 1996; Treno *et al.* 1997; Valencia-Martín *et al.* 2008). In fact, evidence suggests that moderate drinkers who occasionally drink heavily may account for a substantial percentage of alcohol-impaired drivers (Flowers *et al.* 2008).

Table 11.1 Relative risk of driver involvement in all fatal crashes by age

BAC level (%)	Relative risk—all fatal crash		
	16–20 years	21–34 years	35+ years
0.001–0.019	1.33	0.29	0.28
0.020–0.049	2.68	2.32	2.12
0.050–0.079	6.24	4.78	4.03
0.080–0.099	12.61	8.74	6.89
0.100–0.149	33.79	20.30	14.59
≥0.150	490.41	200.03	111.94

Relative risk of driver involvement in all fatal crashes as a function of driver BAC by gender and age, relative to 1.0 for sober drivers of the same age and gender

Source: data from Voas R, Torres P, Romano E, *et al.* (2012) Alcohol-related risk of driver fatalities: An update using 2007 data. *Journal of Studies on Alcohol and Drugs*, 73, 341–350.

11.3 Policy approaches to drink-driving

11.3.1 Lower legal BAC limits

Given the strong relationship between BAC and crash risk, countries have established **per se laws** concerning specific BAC levels at which a driver is presumed to be impaired and can be arrested. BAC can be measured by taking a blood sample from a driver, but also via analysis of exhaled breath. The invention of portable devices for collecting samples of a driver's breath, combined with legislation establishing per se blood alcohol levels defining impairment, has revolutionized law enforcement of drink-driving countermeasures in developed countries (Mann *et al.* 2001). Some portable fuel cell breathalysers can detect BAC starting at 0.001 (Sorbello *et al.* 2018). BAC limits establish a legal definition of driving under the influence (i.e. the level at which a person is considered per se legally impaired). The implementation of a BAC limit varies across countries and is more common in HICs. Around half of low-income countries do not have a BAC limit in place, and where they are established, they tend to be set at 0.08%—a more lenient level. In contrast, 82% of HICs have a national BAC limit at or below 0.05% (World Health Organization 2018c).

There is strong evidence that lowering the BAC limit is an effective intervention for reducing traffic crashes. There is also strong evidence that a lowered BAC limit is effective at a range of levels, i.e. reductions in BAC limits from 0.10% to 0.08%, from 0.08% to 0.05%, and from 0.05% to 0.03% or 0.02% are all effective, and lowering the BAC limit for youth to any measurable amount of alcohol is effective (Fell and Voas 2009). The size of the effect of a lowered BAC, however, varies considerably from one jurisdiction to another and, in some cases, appears to be temporary, although in other cases, effects have been found to be more enduring (Mann *et al.* 2001; Asbridge *et al.* 2004; Fell and Voas 2009). Reducing the BAC limit reduces the likelihood of drink-driving not only of lighter drinkers, but also of heavier drinkers (Wagenaar *et al.* 2007a).

Research has estimated that countries generally experience a decrease in fatal and injury crashes of between 5% and 18% after reducing their BAC limit from 0.08% to 0.05% (World Health Organization 2018a). A recent **meta-analysis** supports this finding (see Table 11.2 for **effect size**) (Fell and Scherer 2017), as does an earlier meta-analysis (Tippetts *et al.* 2005). Individual studies, mainly from HICs, including **time-series** studies, also provide strong support for the effectiveness of lowering the BAC level (e.g. Blais *et al.* 2015; Scherer and Fell 2019).

A zero-tolerance BAC level for all drivers is already in place in 15 countries, and 27 countries have low BAC limits (<0.03%) (Davenport *et al.* 2020). In 2016. Uruguay reduced the legal BAC level from 0.03% to zero-level BAC where driving with any detectable alcohol was prohibited, resulting in an initial 21% decrease in fatal crashes, attenuated to 14% 24 months later. In Brazil, the BAC limit for drivers was lowered from 0.06 to 0.02 in 2008. Significant reductions in traffic injury and fatality rates occurred in the state and capital city São Paulo, with a larger effect found in the capital city, which may have been related to enhanced police enforcement (Andreuccetti *et al.* 2011). In China, the introduction of a BAC limit of 0.02% at the beginning of 2013 resulted in a 7% decrease in traffic fatalities caused by drink-driving (Wang *et al.* 2015).

Evidence shows that enforcement of the BAC level is an essential component in effectiveness. Tippetts *et al.* (2005) found that the effects of reduced BAC limits were greater in US states that had greater enforcement measures. In Scotland, lowering the BAC limit to 0.05% from 0.08% in 2014 was not associated with a reduction in road traffic accidents (Haghpanahan *et al.* 2019), likely due to lack of enforcement. Research in Europe suggests that lowered BAC limits may be ineffective, unless accompanied by relatively strict enforcement (Albalate 2006).

Table 11.2 Percentage decrease in fatal alcohol-related crashes when the maximum BAC limit is lowered

Lowering the BAC	Percentage change in alcohol-related fatal crashes (%)
Lowered from 0.10% to 0.08%	−9
Lowered to 0.05% or lower	−11
Lowered to zero BAC	−7 to −21[a]

[a] Decrease attenuated to 14% by 24 months.

Sources: data from Davenport S, *et al.* (2020) Assessment of the impact of implementation of a zero blood alcohol concentration law in Uruguay on moderate/severe injury and fatal crashes: a quasi-experimental study. Addiction, n/a.; Fell JC and Scherer M (2017) Estimation of the Potential Effectiveness of Lowering the Blood Alcohol Concentration (BAC) Limit for Driving from 0.08 to 0.05 Grams per Deciliter in the United States. *Alcoholism: Clinical and Experimental Research*, 41, 2128–2139.; Andreuccetti G, *et al.* (2011) Reducing the legal blood alcohol concentration limit for driving in developing countries: a time for change? Results and implications derived from a time–series analysis (2001–10) conducted in Brazil. *Addiction*, 106, 2124–2131; and Wang Z, *et al.* (2015) The Underestimated Drink Driving Situation and the Effects of Zero Tolerance Laws in China. *Traffic Injury Prevention*, 16, 429–434.

In summary, the evidence for the deterrent impact of establishing or lowering the legal BAC limit is strong (Asbridge *et al.* 2004; Fell and Voas 2009; Fell and Scherer 2017) across both meta-analyses and studies conducted in a number of countries. The effectiveness of these policies has led many countries to set increasingly stringent BAC levels. Introducing and lowering legal limits for driving can have enduring, long-term effects on drinking and driving fatalities (Mann *et al.* 2001; Asbridge *et al.* 2004; Fell and Voas 2009). However, without consistent and visible enforcement, the effects may be attenuated and diminish over time. Ross (1982) hypothesized that the long-term deterrent impact of strict BAC limits may be undermined because drivers initially overestimate the likelihood of apprehension but gradually come to realize that their chances of detection are, in fact, much lower. Accordingly, rigorous and visible enforcement, combined with media campaigns, are very important for reinforcing the deterrent effects of lowered BAC levels.

11.3.2 Enforcement: random breath testing and selective testing

Certainty of punishment is central to deterrence. Since the actual likelihood of being apprehended and convicted for drink-driving is often quite low (Solomon and Chamberlain 2014), the traditional remedy is to increase the frequency and visibility of drink-driving enforcement.

Random breath testing (RBT), or compulsory breath testing (CBT), is practised in some countries in Australasia, Europe, Asia, Africa, and Muslim-majority countries. In this approach, motorists stopped at random by police are required to take a preliminary breath test, even if they are in no way suspected of any offence. The defining feature of RBT is that any motorist at any time may be stopped and required to take a breath test. To maximize its deterrent effects, RBT is generally conducted so that it is highly visible and widely publicized. In many jurisdictions, the chances of being tested are indeed high. In a survey of 17 European countries, 44% of drivers claimed they had been tested at least once in 2010. The highest numbers of alcohol roadside tests were found in Finland and Estonia, with more than 60% of drivers checked at least once for alcohol (Cestac and Delhomme 2012). Even higher proportions of testing have been reported among Australian motorists (Williams *et al.* 2000). Drivers who had seen an RBT checkpoint or been stopped and tested reported a somewhat greater perceived likelihood of apprehension for drinking and driving, consistent with the programme's aim of having a deterrent effect.

The available evidence suggests that RBT is an effective strategy to reduce alcohol-related traffic crashes. A 2009 meta-analysis concluded that Driving Under the Influence (DUI) checkpoints, including RBT, reduced alcohol-involved crashes by 17% at a minimum (Erke *et al.* 2009). These findings are consistent with a previous meta-analysis that found a 22% decrease in crash fatalities, an 18% decrease in total crashes, and a 24% decrease in drivers with BAC levels >0.08% (Shults *et al.* 2001). Studies from Australia also show the effectiveness of RBT (Ferris *et al.* 2017; Parmar *et al.* 2020). In New Zealand, a 22% reduction in serious or fatal night-time crashes was observed (Miller *et al.* 2004). Media publicity regarding the programme in New Zealand was related to an additional 14% reduction in these crashes. An Australian

study found that implementation of RBT generated a large effect, preventing an estimated 5279 traffic crash deaths in four Australian states (Jiang *et al.* 2014). Figure 11.1 provides a graphic depiction of trends in New South Wales and Victoria following the introduction of RBT.

There is variability in the effectiveness of RBT, depending on the characteristics of the testing programme (and, in some cases, laws affecting testing regimes). A 2009 meta-analysis found that Australia, followed by New Zealand, had the most effective DUI checkpoints, compared to the United States and other countries. Australia and New Zealand employ highly publicized RBT, including the use of 'booze buses', with some jurisdictions determining the number of breath tests needed per year to achieve deterrence. Booze buses are highly visible to all drivers and allow the testing of more drivers than car-based checkpoints (Drummond *et al.* 1992). Also identified as effective was the high intensity of Australian enforcement and the large amount of publicity accompanying the DUI checkpoint programmes (Erke *et al.* 2009). Studies have reported that RBT is cost-effective (Miller *et al.* 2004; Ditsuwan *et al.* 2013).

Another policy option is selective testing or **sobriety checkpoints** where law enforcement officials systematically stop every vehicle (or every *n*th vehicle) passing a predetermined fixed location on a public roadway to ascertain whether drivers might be impaired. The police decide whether they will test, based on the driver's demeanour and responses. Drivers must show some signs of alcohol impairment to be tested. As with RBT, the goal of sobriety checkpoints is to deter drink-driving by increasing drivers' perceived risk of arrest. Sobriety checkpoints are often set up late at night or in the very early morning hours and on weekends when the proportion of impaired drivers tends to be the highest. A weakness of this approach is that experienced offenders believe (with some justification) they can avoid detection. There is evidence from the United States that the police miss as many as 50% of drivers passing through sobriety checkpoints with a BAC of over 0.10% (McKnight and Voas 2001). Given this limitation, it is not surprising that drivers who have personally experienced a sobriety checkpoint, compared with those only indirectly exposed (e.g. through a friend, a relative, or the media), believe their likelihood of arrest for drinking and driving is relatively low (Beck and Moser 2006).

Meta-analyses of impact studies have found that sobriety checkpoints are associated with a 20–26% decrease in fatal crashes and a 20% decrease in total crashes (Shults *et al.* 2001; Elder *et al.* 2002). Sobriety checkpoints need to be well publicized and conducted frequently to be effective. A 2014 **systematic review** found that eight of ten evaluations reported reductions in alcohol-involved crash fatalities after implementing publicized sobriety checkpoint programmes. Programmes with fewer checkpoints and less funding for media publicity were less effective (Bergen *et al.* 2014). In a study of US states, those that conducted sobriety checks at least monthly (vs not conducting checks) were found to have 41% lower drink-driving levels (Lenk *et al.* 2016). Infrequent sobriety checkpoint programmes do not produce general deterrence (Browning and Thompson 2016).

Many jurisdictions do not conduct frequent and publicized DUI enforcement (Eichelberger and McCartt 2016). In Colombia, the effects of sobriety checkpoints are weakened by the lack of a legal requirement to submit to a BAC test and poor implementation of sanctions (Castano 2012). Thus, sobriety checkpoints are unlikely to be
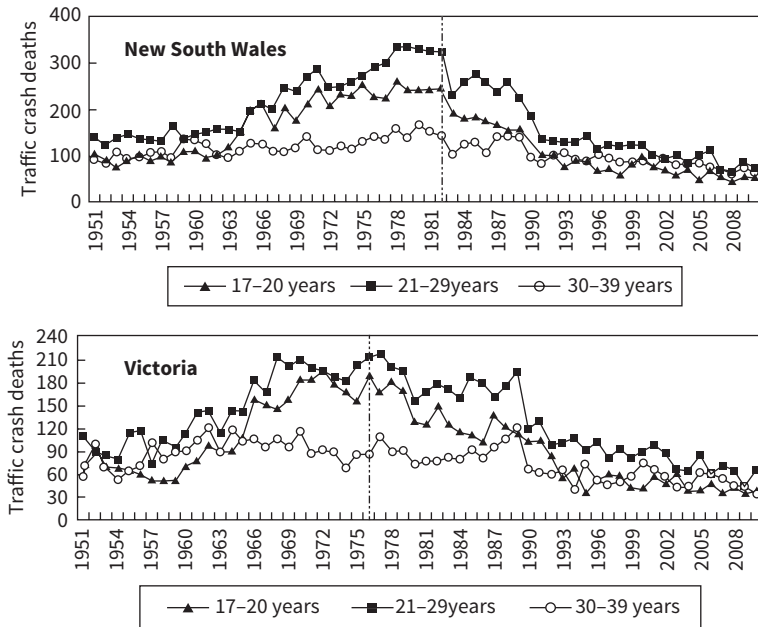
Figure 11.1 Traffic crash deaths before and after the introduction of RBT in the Australian states of New South Wales and Victoria by year. The vertical broken line indicates the date of introduction of random breath testing (RBT).

Reproduced with permission from Jiang H, Livingston M, and Manton E (2014) The effects of random breath testing and lowering the minimum legal drinking age on traffic fatalities in Australian states. *Injury Prevention*, 21, 77–83.

successful, unless there is vigorous implementation, high visibility, and public awareness (Homel 1993).

In summary, the research evidence is strong for sustained and significant effects of RBT and sobriety checkpoints in reducing drink-driving and associated crashes, injuries, and deaths (Shults *et al.* 2001), with studies showing about a 20% decrease in crashes (with some variation). However, sobriety checkpoints are less effective than RBT, as drinking drivers may avoid detection, and their effectiveness as a means to achieve deterrence relies more on the frequency with which checkpoints are conducted. RBT programmes are most likely to be effective when they: (1) are highly visible; (2) include rigorous enforcement; (3) are sustained and consistent; (4) involve at least one in three motorists being breath-tested each year; and (e) are accompanied by extensive publicity that reinforces or increases the perceived likelihood of being stopped by the police and tested (Homel 1988). In other words, enforcement of drink-driving law is effective to the extent people *perceive* they will be detected. Programmes with these specifications deter drink-driving and prevent the erosion of effectiveness, which can occur through a lack of RBT visibility and because of undetected drink-driving episodes (Homel 1993).

11.3.3 Severity of punishment

A tenet of the deterrence theory is that a punishment for a behaviour must be sufficiently severe if it is to reduce the likelihood of that behavior occurring in the future. It is often assumed that more severe penalties are more effective as a deterrent than less severe penalties. However, increased severity may reduce other factors that increase deterrence, since the prospect of a severe penalty may be countered with a more elaborate defence that reduces certainty or swiftness of punishment. Severity in the context of drinking and driving has typically been addressed either by changing maximum penalties or by introducing mandatory minimum penalties.

Several studies have investigated mandatory jail sentences for drinking and driving. Overall, the evidence for the effectiveness of mandatory jail sentences is mixed. While a few studies have found they decrease alcohol-related fatalities and related outcomes (e.g. Stout *et al.* 2000), most do not report such effects (e.g. Legge and Park 1994; Ross and Klette 1995; Ruhm 1996; Benson *et al.* 1999). A time-series study of mandatory jail sentences across the United States found no discernible effect of the implementation or severity (length) of these sentences on single-vehicle night-time or alcohol-involved crashes (Wagenaar *et al.* 2007b). One study (McKnight and Voas 2001) observed that more severe penalties, such as minimum imprisonment, may have beneficial indirect effects when such punishments motivate repeat offenders to participate in probation or treatment programmes.

There is some evidence that mandatory fines may reduce drinking and driving (Stout *et al.* 2000; Wagenaar *et al.* 2007b; Tavares *et al.* 2008). Other studies, however, have found no effect of increased fines on alcohol-related crashes (e.g. Benson *et al.* 1999).

There is limited evidence that increased sanctions by themselves reduce drink-driving or alcohol-related crashes (Ross and Voas 1989; Mann *et al.* 1991). In many cases, the implementation of more severe sanctions, such as increased fines or jail sentences, is confounded by other policy changes, making it difficult to ascertain unique effects. It may be more reasonable to consider the totality of sanctions when evaluating effects on drink-driving. In this regard, a cross-sectional study found that people living in US states with stricter and more comprehensive drink-driving policies (including BAC levels and criminal and administrative sanctions and fines) are about 60% less likely to report drink-driving, compared to those from states with less restrictive policies (Shults *et al.* 2002). Three years following the introduction of stricter measures in Japan, including a lowered BAC level, increased fines, and a possible 3-year jail sentence, relative reductions in alcohol-related crash rates among adults (50%) and 16- to 19-year olds (64%) were found (Desapriya *et al.* 2007). Similarly, criminal sanctions for drink-driving implemented in Taipei, Taiwan in 1999 included a mandatory jail sentence, substantial fines, and licence suspension. The new policy was also accompanied by considerable media attention. An evaluation showed a 73% reduction in fatal alcohol-related crashes over the 20 months following implementation (Chang and Yeh 2004). The effect of this policy package appeared to be greater initially and then declined, suggesting increased sanctions may have a natural 'life cycle' and lose

their effectiveness over time, unless accompanied by renewed enforcement or media attention to reinforce these efforts.

11.3.4 Swiftness of punishment

Swiftness of punishment refers to the temporal proximity of punishment to the drink-driving event. The deterrence theory proposes that punishments that are administered quickly will have a greater general deterrent effect than those that are delayed. Many sanctions for drinking and driving are imposed only after long delays in scheduling administrative hearings or court proceedings. One exception is pre-conviction **administrative licence revocation (ALR)** or suspension for drink-driving. With an administrative suspension, licensing authorities can suspend a driver's licence without a court hearing, often at the time of, or very shortly after, the actual offence. Research suggests that ALR is a cost-effective strategy (Miller *et al.* 1998).

Enforcement of ALR may be problematic, with as many as 75% of offenders continuing to drive with a suspended licence (Voas and DeYoung 2002). Nonetheless, evaluations of ALR interventions have found consistent effects on alcohol-related crashes, presumably reflecting less or more careful driving by persons lacking a valid licence. Thus, studies have found that licence suspensions are most effective at reducing offending during the licence suspension period (Watson *et al.* 2017). In Ontario, Canada, immediate roadside licence suspension for the BAC range of 0.05–0.08% was associated with a 17% decrease in the number of fatal or injury crashes (Byrne *et al.* 2016). In another evaluation, a 90-day ALR in Ontario was associated with a 14% reduction in total driver fatalities (Asbridge *et al.* 2009). McKnight and Voas (2001) reported an average reduction of 5% in alcohol-related crashes and a 26% reduction in fatal crashes associated with ALR in the United States.

11.4 Restrictions on young or novice drivers

Young drivers (adolescents aged between 16 and 20) are at elevated risk of traffic crashes, especially alcohol-involved crashes, as a result of their limited driving experience and tendency to experiment with heavy or binge drinking. Special policy strategies have been formulated to prevent drink-driving among this age group.

11.4.1 Low BAC limits for young or novice drivers

Zero tolerance laws for young or novice drivers set the BAC limits at the minimum that can be reliably detected by breath testing equipment (i.e. 0.001–0.02). Lower maximum BAC limits for novice drivers are relatively common, with over 90 countries setting BAC limits for novice drivers of between 0% and 0.05% (World Health Organization 2018a). Much of the evidence for effectiveness comes from the United States where the minimum age for a driver's licence is often lower than in other HICs (Room 2004). Zero tolerance laws have proven effective in reducing single-vehicle

night-time fatal crashes among drivers under 21 (relative reductions of around 20%) (Hingson *et al.* 1994; Martin *et al.* 1996), although smaller reductions in fatal crashes have been found (Fell *et al.* 2016). In other countries, zero tolerance for novice drivers has also been found effective for reducing drink-driving and fatal crashes (Shults *et al.* 2001; Chamberlain and Solomon 2008).

11.4.2 Licensing restrictions and graduated licensing

A number of countries have implemented **graduated driver licensing** (GDL), which places restrictions on young or novice drivers (e.g. prohibits night-time driving, driving with other young people in the vehicle, driving without an adult in the car) in order to achieve some of the benefits of delayed licensing. A **Cochrane review** of studies from the United States, Canada, New Zealand, and Australia concluded that GDL was effective in reducing alcohol-related crashes (Hartling *et al.* 2004). More recent studies confirm GDL reduces crashes among teenagers (8–14% for basic GDL laws, and up to 30% for stronger GDL laws) and, in some cases, can have longer-term effects for up to 5 years (McCartt *et al.* 2010; Masten and Foss 2010). In contrast, a few studies (e.g. Masten and Hagge 2004) have found no effects for GDL on teenage crash rates. There is wide variation in how GDL programmes are implemented across jurisdictions. In addition, some GDL programmes incorporate zero tolerance provisions, making it difficult to evaluate the unique contributions of delayed licensing and other restrictions to reductions in crash rates among young people.

The evidence shows that lower BAC limits, delayed access to a full licence, and other driving restrictions for young drivers can be effective strategies for reducing drink-driving and related fatalities among the young. Graduated licensing can incorporate all of these strategies within one system by imposing zero tolerance measures and controlling the rate and manner in which young drivers gain access to full driving privileges. GDL has been well accepted where implemented, and the available evaluations as a whole demonstrate considerable benefits.

11.5 Preventing recidivism

Some convicted offenders continue driving after drinking and are rearrested or involved in further traffic crashes. A range of studies from HICs document a 3- to 5-year prevalence of recidivism of between 10% and 30% (McCartt and Williams 2004; Williams *et al.* 2007; Richardson 2013; Bean *et al.* 2014; Møller *et al.* 2015; Chen and Jou 2018). Approaches to preventing drink-driving recidivism have included treatment, intensive supervision programmes, DUI courts (specific courts for DUI offences), alcohol and drug courts, interlock devices, victim impact panels (where the drink-driver must hear testimony about the adverse effects on others of the DUI offence), and other interventions. Preventing repeated drinking and driving is difficult, in part because many recidivists are alcohol-dependent or suffer from other co-morbid disorders. As many as 54% of repeat impaired-driving offenders meet the

clinical criteria for alcohol dependence, and 40% or more meet the criteria for life-time drug abuse (Lapham *et al.* 2006a). As a result, recidivist drink-drivers may be less receptive to traditional deterrence and may need a more comprehensive approach (Simpson *et al.* 2004; Williams *et al.* 2007).

11.5.1   Treatment

Remedial treatment that is either mandated or imposed as a condition for reduced sanctions may have modest effects on drink-driving recidivism (DeYoung 1997; Dill and Wells-Parker 2006). A Cochrane review concluded there was insufficient evidence to determine if treatment (primarily brief interventions in a clinical setting) alone reduces motor vehicle crashes and related injuries (Dinh-Zarr *et al.* 2004). An early meta-analysis of 215 studies of drink-driving remediation programmes, for example, concluded that treatment alone had only modest effects, with larger effect sizes for combined interventions (education and psychotherapy/counselling) than for those involving only one component (Wells-Parker *et al.* 1995). A 2015 systematic review by Miller *et al.* (2015) also found that multi-component programmes including coun-selling/treatment are more effective for reducing recidivism than single-component programmes. Brief motivational interviewing and cognitive behavioural therapy have also been evaluated in several studies. One study found no effect of brief motivational interviewing on rearrest rates, whereas another found that it was better than standard treatment (Schermer *et al.* 2006). Cognitive and cognitive behavioural therapy inter-ventions have been found to produce lower rearrest rates (Mills *et al.* 2008; Moore *et al.* 2008).

11.5.2   DUI courts

Alternative approaches have been developed that target high-risk DUI offenders to ensure they receive effective rehabilitation (MacDonald *et al.* 2007). DUI courts were developed as an extension to the drug court model for repeat DUI offenders (Miller *et al.* 2015). DUI courts are generally, although not always, voluntary programmes that combine offender supervision with individualized treatment. The types of inter-ventions utilized by DUI courts are important—longer programme duration and high intensity of contact between the participant and the DUI court can result in more fa-vourable outcomes (Sloan *et al.* 2013).

Of the studies specifically evaluating DUI courts, short- and long-term deterrent effects have been found (Lapham *et al.* 2006b; Fell *et al.* 2010; Sloan *et al.* 2016). A 2012 meta-analysis reported that DUI courts can be effective (Mitchell *et al.* 2012). In the United States, three DUI courts prevented between 47 and 112 repeat arrests during a 4-year period due to reduced recidivism (Fell *et al.* 2010). The characteristics of the courts need to be considered when interpreting the literature, as DUI courts can be very different, using different interventions (Miller *et al.* 2015) that may affect out-comes and effectiveness.

11.5.2.1 Interlock devices

Ignition interlock devices prevent a vehicle from being started until the driver passes a breath test using special equipment installed in the automobile. Interlock programmes are in place or are being introduced in many jurisdictions in North America, Europe, Australia, and New Zealand. Interlock programmes range from those that are mandatory and require offenders to have interlock devices installed on their vehicles, to voluntary programmes that allow offenders to have a shortened period of licence suspension if they have these devices installed. Interlocks can now be linked with technology to record driver actions and vehicle responses, including electronic (GPS) tracking of the vehicle and rapid means for monitoring the integrity of the interlock system (Voas 2014). There is also activity to create cars that passively detect alcohol and, in response, automatically slow or disable the car (Marques 2010).

Well-implemented interlock programmes may reduce recidivism by 65% or more (Roth *et al.* 2007; Marques 2009), but the likelihood that more motivated drink-drivers self-select into interlock programmes is a problem for many evaluations. Nonetheless, a Cochrane review of the best available studies concluded that drink-driving offenders with interlocks installed are about 36% less likely to reoffend, compared to drivers without interlocks (Willis *et al.* 2004). The effects of interlock programmes seem to be mainly limited to the period of time that the interlock is actually installed on the vehicle (DeYoung *et al.* 2005; Marques and Voas 2005; Marques 2009; Ma *et al.* 2016). However, some recent studies have reported post-installation reductions in recidivism (Vanlaar *et al.* 2017), and reductions in recidivism of up to 32% 12–48 months following removal of the interlock, when combined with treatment (Voas *et al.* 2016). Interlocks can reduce fatal crashes when they are made mandatory (Voas and Marques 2003; McGinty *et al.* 2017).

11.5.2.2 Intensive supervision programmes

Intensive supervision, or 24/7 programmes, are an alternative sanction to incarceration for DUI offenders. Research indicates they are effective in reducing recidivism. These programmes can include screening and assessment of substance abuse problems, treatment and education related to drink-driving, intensive supervision (such as electronic monitoring where the offender wears a leg or arm device which will detect and record any alcohol consumption), self-help, alcohol and drug testing, licence sanctions, interlocks, required sale of the vehicle, home confinement, and community service (Miller *et al.* 2015). Some intensive supervision programmes have been found to lower recidivism by 54% up to 8 years after the offence (Wiliszowski *et al.* 2010).

11.5.2.3 Victim impact panels

A systematic review determined there is no evidence of effectiveness for **victim impact panels** (VIPs) (Miller *et al.* 2015). Adding VIPs into standard recidivism programmes does not increase effectiveness (Wheeler *et al.* 2004).

In sum, the evidence supports the effectiveness of multi-component approaches to drink-driving recidivism (Ma *et al.* 2015; Miller *et al.* 2015). Evidence of effectiveness comes from evaluations of intensive supervision programmes, multi-component programmes, and similar programmes administered via DUI courts that utilize

comprehensive approaches. Overall programmes that consistently show significant reductions in DUI recidivism tend to be well structured and include treatment, education, and monitoring (Miller *et al.* 2015). Other research has reported that effective programmes are those conducted for more than 10 weeks or with rules of attendance enforced by a court (Dill and Wells-Parker 2006; Wells-Parker 2000). These approaches can offer a compassionate response to individuals experiencing alcohol dependence, which contributes considerably to recidivist behaviour. Vehicle programmes that prevent access to cars or restrict driving, such as interlocks, are effective while the restrictions are in place, and there is emerging evidence that longer-term impacts may occur. In this regard, interlock programmes appear to be promising.

11.6 Designated driver and safe ride services

Designated driver programmes were developed to decrease driving after drinking, by encouraging groups of drinkers in public or social settings to select a member of the group to serve as the designated sober driver. A systematic review (Ditter *et al.* 2005) concluded the evidence for the effectiveness of designated driver programmes was marginal, at best.

Safe ride services are the quintessential harm reduction approach to drink-driving. They allow people to drink as much as they want, with the idea that some of the harms will be reduced by providing transportation to drinkers who would otherwise drive. While taxis were the traditional alternative in such situations, the landscape of safe ride services, and the nature of transportation more generally, has been transformed with the advent of Uber and other similar ride-hailing companies. As of 2019, Uber is estimated to have over 110 million worldwide users (Mazareanu 2019). However, there is mixed evidence as to whether Uber and similar services reduce drink-driving crashes (Brazil and Kirk 2016; Greenwood and Wattal 2017; Morrison *et al.* 2018, 2021).

In summary, it is likely that designated drivers account for a relatively small percentage of drivers at a given time, and therefore, no overall impact on alcohol-involved accidents or other drink-driving outcomes has been demonstrated. As the research evidence about safe ride services is just emerging, the evidence concerning effectiveness should be considered preliminary.

11.7 Emerging issues for drink-driving

An emerging area for drink-driving is drivers who are also driving under the influence of psychoactive substances other than alcohol. There is a shift in some countries toward legalization of cannabis, and the risk from driving under the influence of both alcohol and cannabis is greater than the risk of driving under the influence of either alone (Sewell *et al.* 2009). Millions of people, particularly in the United States and other HICs, engage in the non-medical use of prescription medicines that may affect driving, e.g. analgesics, stimulants, anxiolytics, sedatives (Benotsch *et al.* 2015). Drivers are often unaware of the negative effects of prescription medicines on driving

(Malhotra *et al.* 2017), especially when combined with alcohol. The added risks for driving of alcohol–drug interactions have yet to be well examined.

11.8 Effects of other alcohol policies on drink-driving

Alcohol control policies, including measures that affect the overall level of alcohol consumption, reduce traffic-related harm as well. In Lithuania, universal policy measures (e.g. increases in taxation, decreases in availability and marketing), along with additional drink-driving policies, including the introduction of a criminal offence for drivers with a BAC limit of ≥1.5‰ (1.5 per mille), resulted in a marked decrease in traffic-related harm (Rehm *et al.* 2020). This suggests drink-driving laws act synergistically with other types of alcohol policies, which is plausible as traffic injury is mainly impacted by occasional heavy drinking before the crash (Cherpitel *et al.* 2015; Rehm *et al.* 2017). See Chapters 7 and 8 for further discussion of the impact of alcohol policies on drink-driving harm.

11.9 Conclusion

As described in Chapter 6, the strategies and interventions reviewed in this book were rated by the authors in two major areas: evidence of effectiveness and amount of research support. Table 11.3 provides a summary of the ratings for the interventions considered in this chapter, for which there are a minimum number of evaluation studies (see ⊜ Online Appendix 1 and Chapter 6 for an explanation of the methods).

Though evidence from LMICs is limited in many cases, many interventions have good population reach. Table 11.3 shows that most—but not all—interventions have some evidence of effectiveness, with the following being evaluated as particularly effective:

1. Low or lowered maximum BAC levels (0.00–0.05%): in general, the lower the BAC legal limit, the more effective the policy. The effect of low or lowered BAC levels has a broad population reach.
2. Zero tolerance for youth: even if the legal BAC limit for adult drivers is higher, there is clear evidence that lower BAC limits for youth, especially those below the legal drinking or alcohol purchase age, can be effective. This strategy becomes particularly useful where the adult BAC limit is >0.03. Population reach is low, as only those under the drinking or purchase age are affected.
3. RBT 'anywhere, anytime': the consistent and high-profile RBT enforcement of drinking and driving has demonstrated evidence of effectiveness. High-intensity, well-executed mass media campaigns increase the effectiveness of RBT by increasing the general deterrence effect. The effect has a broad population reach.
4. Swift punishment: in general, when punishment for drinking and driving is swift, the effectiveness of the punishments (at any level of severity) is increased. Administrative licence suspension is most effective when consistently applied

Table 11.3 Consensus ratings of strategies and interventions to prevent alcohol-impaired driving[c]

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Establishing a BAC level	+	++	Introducing a BAC limit, even at a lenient level of, for example, 0.08%, can have a deterrent effect enough to reduce alcohol-impaired driver fatalities. The effect has a broad population reach
Low or lowered BAC levels (0.00–0.05%)	++	+++	In general, the lower the BAC legal limit, the greater the reduction in crash deaths and injuries. The effect has a broad population reach
Low BAC for young drivers ('zero tolerance')	+++	++	Clear evidence that lower BAC limits for youth, especially those below the legal drinking or alcohol purchase age, can be effective. Population reach is restricted to those below the drinking/ purchase age
Graduated licensing and other restrictions on young and novice drivers	++/+	++	Graduated driver licensing can reduce drink-driving and fatalities among young people. It can be used to incorporate lower BAC limits and licensing restrictions within one strategy. Some studies indicate that 'zero tolerance' provisions are responsible for this effect
Random breath testing (RBT)	+++	++	Evidence of a strong effect on alcohol-impaired driving. Effectiveness depends on the number of drivers deterred and the extent of consistent and high-profile implementation. Mass media campaigns increase the effectiveness of RBT. The effect has a broad population reach
Sobriety checkpoints	++	++	Sobriety checkpoints are potentially effective but appear to be less so than RBT, as drivers can escape detection and their effectiveness relies more on their frequency of implementation
Administrative licence suspension	++	++	When punishment is swift, effectiveness is increased. Reductions in crashes are greatest during the licence suspension period. Population reach is low, affecting only those who are caught

Table 11.3 Continued

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Comprehensive mandatory sanctions	++/+	++	Comprehensive sanctions, including lowered BAC, criminal sanctions, and fines, reduce drink-driving crashes in the short term; long-term effects have not been assessed. Comprehensive mandatory sanctions alone reduce fatal crashes, but effects may decay over time unless accompanied by renewed enforcement and media publicity
Increased severity of punishment	0/+	++	Limited evidence of effectiveness concerning increased severity of punishment alone (e.g. mandatory jail sentences, increased fines alone)
Designated drivers	0	+	Multiple studies indicate that designated driver programmes do not prevent or reduce alcohol-impaired driving and do not affect alcohol-related crashes. Population reach is low, as it is likely that designated drivers account for a relatively small percentage of drivers at any given time
Remedial treatment/brief motivational interviewing, cognitive behavioural therapy	0/+	+/++	Treatment alone has limited effectiveness to reduce recidivism, and it applies only to a small number of individuals. There are too few studies to draw firm conclusions
Intensive supervision programmes	+++	++	Intensive supervision programmes with the following features can be very effective: screening/assessment for alcohol/substance abuse, relatively long duration, close monitoring and supervision, especially for alcohol/other drug abuse, and the threat of jail for non-compliance. Population reach is low, as only recidivist drink-drivers are affected
DUI-specific courts	++	++	DUI courts can produce short- and long-term deterrents to recidivism. Additional experimental evaluations of DUI courts are needed to demonstrate their effectiveness more definitively. Population reach is low, as only recidivist drink-drivers are likely to be affected

<div align="right">(continued)</div>

Table 11.3 Continued

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Interlock devices	++	++	Interlocks can be effective at reducing recidivism when mandatory. Effects mainly confined to period of interlock instalment, but some studies show longer-term reduction in recidivism. Population reach is confined to those caught drink-driving. User-pay requirements are likely a barrier to uptake
Victim impact panels	0	++	Evidence of no effectiveness. Population reach low, as only recidivists are affected

[a] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ Evidence of a strong effect on consumption or problems; ? One or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[b] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include LMICs; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in LMICs.

[c] For further information, please see ⊜ Online Appendix 1.

and brings enforcement and sanction closer in time, i.e. the ability of legal or judicial authorities to remove a driver's licence immediately, or within a short time, following arrest for drinking and driving. Population reach is limited to those caught drink-driving.

5. Multi-component programmes to reduce recidivism, including treatment, supervision, and sanctions, are effective in reducing recidivism e.g. intensive supervision programmes and multi-component programmes, and DUI courts may also be promising. Interlock devices seem effective, especially when they are mandatory or combined with treatment. Evidence of long-term effectiveness is starting to emerge. VIPs, safe driver programmes, and education alone are ineffective strategies to reduce recidivism.

LMICs face special challenges in preventing alcohol-related crashes and fatalities relative to HICs, including an interaction between alcohol use and poorer road conditions, higher number of passengers, higher density and diversity of vehicles, greater intermingling of pedestrians, non-motorized and motor vehicle traffic, and limitations on resources that can be devoted to improving traffic safety (Mohan 2002; O'Neill and Mohan 2002). Lack of funding, human resources, equipment, and political support may be serious barriers to effective drinking and driving policy implementation and

enforcement (Davis *et al.* 2003). Enforcement of legal BAC limits, for example, may be impossible where the police do not have breath-testing equipment.

There are additional considerations for policy in LMICs. Policies need to take more account of harm to others. For every drunk driver, there are more passengers at risk (Shield *et al.* 2020). A high-impact policy intervention for LMICs would be to introduce a zero BAC limit which is also enforced for professional drivers (particularly those driving maxi taxis, small transport, and buses) (World Health Organization 2015). Communities need to enforce strategies that are known to be effective, such as RBT, in order to enforce BAC laws.

Obtaining adequate evaluation data is also an issue. In many LMICs, there is still a lack of road safety data in general, and of impaired driving in particular. Although there is much to be learnt from research on what is effective in developed countries, policies and other interventions must be developed, adapted, and evaluated within the specific cultural and resource contexts of LMICs. Finally, providing technical assistance and support to developing countries for addressing impaired driving has been identified as an important issue (Davis *et al.* 2003).

In conclusion, one of the most important public health policy successes in the second half of the twentieth century has been the reduction in alcohol-involved traffic crashes, particularly in higher-income nations. International evidence suggests that drink-driving countermeasures can consistently produce long-term, population-wide reductions in drink-driving and alcohol-related crashes. Recognition of the problems remaining, such as persistent recidivism among high-risk impaired drivers, should not detract from the enormous achievements of recent decades. It is also clear, however, that many countries, especially those in lower-income parts of the world, have not benefited equally from these advances. As the populations of such countries become able to purchase and operate automobiles, problems associated with impaired driving will become even more acute.

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12

Modifying the drinking context: reducing harm in the licensed drinking environment and other contexts

12.1 Introduction

Alcohol is consumed in a variety of contexts, including private residences, licensed premises, and other settings such as parks, beaches, and cars. Most interventions addressing the drinking context apply to public, usually licensed, drinking environments. For example, licensed places (e.g. bars, pubs, nightclubs, sports venues, restaurants) may be subject to regulations such as limiting the number of people who will be allowed to be present in the venue and requiring staff training.

Previous research has focused mainly on *licensed drinking* venues (i.e. venues where alcohol consumption and socializing are the main focus) not only because they are environments that are subject to regulations, but also because they are high-risk settings for alcohol-related problems (Graham and Homel 2008; Huckle *et al.* 2016). As public spaces, research and evaluation can be conducted in these settings with minimal privacy concerns. However, policies and interventions have also been applied to other contexts where alcohol is licensed for consumption, but not the primary focus, such as sports venues and festivals. In addition, a few interventions have been developed for social drinking contexts other than licensed premises such as parties or the drinking culture generally (Room *et al.* 2021).

12.1.1 Implementing interventions to modify the drinking context

The content and implementation of interventions aimed at modifying the drinking context will depend on a number of considerations. One is the particular issue to be addressed. For example, interventions might focus on: the behaviour of venue staff who control (and sometimes contribute to) heavy alcohol consumption and alcohol-related harms (see reviews by Graham and Homel 2008; Hughes *et al.* 2012; Stevely *et al.* 2020); venue characteristics, such as crowding, that are associated with harms (Graham and Homel 2008); or the broader environment, including problems in the public space outside venues (Townsley and Grimshaw 2013).

Second, planning may involve weighing the public health benefits of the intervention against the social and economic costs borne by people and businesses when restrictions are imposed. This means taking into consideration the function of drinking as a 'time-out' activity (Cavan 1966; Graham and Homel 2008) and the financial and

other rewards relevant to venue operators and staff, as well as the economic role of licensed premises and the night-time economy generally (Hobbs *et al.* 2000). These concerns may limit the scope of the intervention, sometimes preventing it from being implemented fully.

A third consideration is the broader culture and the role of alcohol within that culture. For example, as described later in this chapter, policing and other enforcement approaches that are successful in one cultural context may not be successful in another.

Fourth, the most suitable intervention may depend on whether the focus is on alcohol consumption, alcohol-related harms, or both. Strategies relating to alcohol consumption per se typically focus on reducing service to individuals who are intoxicated or who are younger than the legal drinking age. Strategies that focus on alcohol-related problems, on the other hand, may successfully reduce the problem without necessarily changing alcohol consumption, although reducing alcohol consumption may be part of the focus.

Finally, it is important to consider how the components of an intervention are expected to achieve the desired reduction in consumption or related problems. Figure 12.1 shows how enhanced enforcement initiatives are hypothesized to affect several proximal and ultimate outcomes (Rammohan *et al.* 2011). Following one path in the figure, enforcement initiatives are hypothesized to increase responsible beverage service training, thereby improving servers' ability to detect and refuse service to intoxicated persons, and ultimately reducing excessive alcohol consumption and related harms.
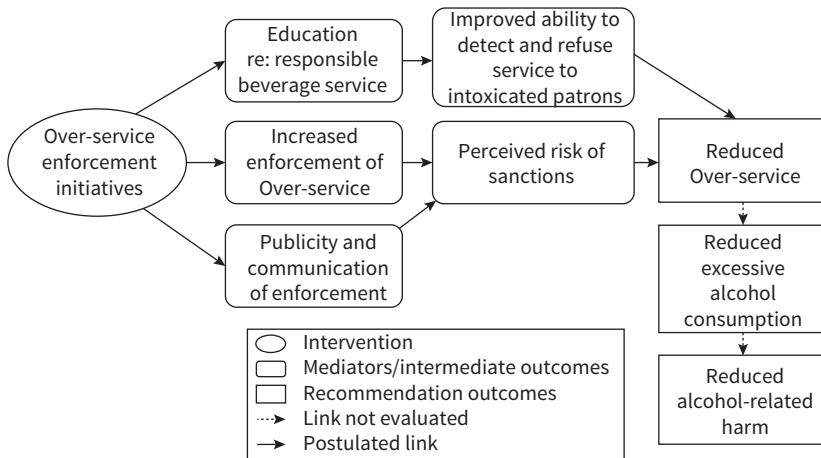
Figure 12.1 Analytic framework: enhanced enforcement of alcohol over-service initiatives.

Reproduced with permission from Rammohan V, Hahn RA, Elder R, *et al.* (2011) Effects of dram shop liability and enhanced overservice law enforcement initiatives on excessive alcohol consumption and related harms. *American Journal of Preventive Medicine*, 41(3):334–343.

This model also provides a roadmap for evaluation. That is, evaluation might address any or all of the following questions related to short- and long-term goals: Did server training increase as a result of enforcement? Did the server's knowledge, attitudes, and skills change? Did the server's actual serving behaviour change? Was there a measurable change in the number or proportion of intoxicated people in the venue? Did the training achieve the ultimate outcome, i.e. a reduction in harms such as violence, automobile accidents, or deaths?

There are three further evaluation considerations in changing the drinking context, usually only addressed when interventions have been shown to have the desired intermediate and ultimate outcomes: Is the intervention still effective when applied in other situations, i.e. outside the original research environment? Is the impact sustainable? Is the intervention cost-effective?

Finally, superimposed on these considerations is the impact of the coronavirus disease (COVID-19) pandemic and other infectious diseases on drinking contexts. The global coronavirus disease (COVID-19) pandemic that began in 2020 had a profound effect on the operations of licensed establishments and other drinking contexts around the world, by closing premises or imposing social distancing restrictions and protective mask-wearing on people engaged in social drinking to reduce the high risk of contagion in these venues (see Box 2.1 in Chapter 2). The combination of regulations and normative expectations about risks is likely to have reduced drinking in public venues.

12.1.2 A framework for approaches to modifying the drinking context

Interventions to modify the drinking context can reduce alcohol consumption or related problems by: (1) changing the behaviour of individuals in the drinking context; (2) modifying aspects of the venue itself (e.g. staff behaviour, policies); (3) improving regulatory and policing practices that control venue practices; and (4) taking a co-ordinated community approach to adopting interventions at levels 1–3. The evidence related to these levels of intervention is summarized in this chapter. In addition, more details about the interventions and their evaluations are provided in Tables A12.1 to A12.4 in ⊜ Online Appendix 2.

12.2 Interventions to change behaviour of individuals in the drinking context

Preventive interventions focused on modifying the behaviour of people toward others in the drinking environment are relatively new. Many build on group responsibility within peer groups, group influence, and a general guardianship role toward other drinkers within the drinking culture generally. Other programmes focus on the safety of individuals in the broader drinking context, e.g. as they leave venues, particularly in areas with a high density of licensed premises.

12.2.1 Peer-focused interventions

Peer-focused interventions are designed to prevent intoxication and harms among individuals and groups by using the power of the group. For example, *SafeNights,* a 7- to 10-minute intervention, was delivered to groups of young people crossing the border from the United States to drink in Mexico where the minimum drinking age was lower (Kelley-Baker *et al.* 2011). *SafeNights* was later modified for use on college campuses and other 'portals' to high-risk drinking locations (Brooks *et al.* 2013). The programme builds on peer support and group responsibility, with the goal of reducing alcohol consumption and decreasing victimization of young women. The programme achieved partial success in reducing sexual victimization of women (Kelley-Baker *et al.* 2011) and some other forms of aggression (Brooks *et al.* 2013), but did not result in less alcohol consumption or aggression generally. Similarly, evaluation of a group-based mobile intervention that used a peer group approach to promote safety and prevent impaired driving and riding (Byrnes *et al.* 2019) found an increase in actions to keep other group members safe and lower BACs of patrons exiting venues, but other outcomes were not affected.

The *Sisonke Mentor and Counselling Intervention* pilot project in Tshwane, South Africa included peer intervention and brief counselling (Morojele *et al.* 2014) to reduce human immunodeficiency virus (HIV) and risk of other harms. The pilot project demonstrated the feasibility of the approach but did not measure other outcomes.

The above interventions draw on evidence that people's drinking is highly influenced by the drinking norms of others in their drinking group (MacAndrew and Edgerton 1969; Room *et al.* 2021). To address these norms directly, the Alcohol Culture Change Initiative of VicHealth in Australia demonstrated the feasibility of implementing a range of public health interventions to change the drinking norms in heavy drinking cultures around the world, and thereby reduce risky drinking and associated problems (VicHealth 2019a, b).

12.2.2 Bystander intervention training to prevent sexual assault

Programmes to train bystanders to prevent sexual assault, especially in drinking settings, have been developed in high schools, colleges, and universities (Langhinrichsen-Rohling *et al.* 2011; Banyard *et al.* 2014; Bennett and Banyard 2016; Powers and Leili 2018). Bystander training has been found effective in changing participants' attitudes, knowledge, and intervening behaviour, and decreasing rape-supportive attitudes, but has not demonstrated an impact on rape perpetration (Katz and Moore 2013).

Bystander training programmes are important because they apply to all public drinking settings, including unlicensed settings such as parties, and have been widely adopted in educational settings across North America. However, their success in preventing sexual assault of women specifically in drinking contexts has not been evaluated, and cross-cultural applicability to non-student populations has not been demonstrated.

12.2.3 Services to assist bar-goers as they leave bars

Interventions to provide assistance to patrons after they leave drinking venues typically focus on areas with a high density of venues. These interventions have been positively viewed by users (Irving *et al.* 2020), with one study finding some evidence of successful diversion of patrons from emergency departments (Moore *et al.* 2021), while another found a reduction in serious assaults, but no impact on common assaults or emergency department use (Taylor *et al.* 2020).

Other strategies to address problems as patrons leave premises in high-density bar areas include supervised taxi queues (Hadfield 2009) and extending public transit hours. These approaches have shown no evidence of impact (Curtis *et al.* 2019b), although they may be useful as part of multi-component initiatives (Miller *et al.* 2014).

12.2.4 Summary and policy implications

Peer-focused and bystander interventions involve mostly educational approaches (similar to those described in Chapter 10), although their strength is in focusing on peer influence and the willingness of peers to protect one another. This focus draws on research showing that peer group members are known to play an important role in alcohol consumption (Dumas *et al.* 2014) and alcohol-related violence (Dumas *et al.* 2015; Levine *et al.* 2012). This peer focus also builds on the willingness of people to modify their behaviour for the safety of others (Byrnes *et al.* 2019) and draws on a sense of peer group responsibility that is particularly prevalent among young adults.

Individual-focused approaches often require substantial resources to reach a relatively small number of people, and the research is mostly from the United States. Nevertheless, these interventions can play an important role, especially in contexts where other interventions are ineffective or unfeasible.

These interventions build on the role of potential 'helpers' in the environment, consistent with the situational crime prevention theory that harm can be prevented by a capable person who intercedes as a 'guardian' to protect the potential victim or as a 'handler' to dissuade the potential perpetrator (Felson 1995). In addition, these interventions tend to be directed at individuals who are at high risk of harm, regardless of where they drink. For colleges and universities, approaches such as bystander training may thus be considered worth the investment.

12.3 Venue-focused interventions

The way that venues are managed and designed plays a crucial role in patrons' level of intoxication and their risk of harm (Madensen and Eck 2008; Tutenges and Bohling 2019). Accordingly, venue-focused interventions have been developed to address the drinking context through staff and management training, changing bar policies, and reducing other contextual risks (see Healthy Nightlife Toolbox at http://www.hntinfo.eu/).

12.3.1 Training and house policies regarding alcohol service in licensed drinking venues

Many jurisdictions have laws or regulations prohibiting service of alcohol to intoxicated and underaged patrons. These laws, by themselves, have proven to be largely ineffective (e.g. see Toomey *et al.* 2016). Therefore, what are variously called server training, server intervention, responsible service of alcohol (RSA), or **responsible beverage service (RBS)**[1] programmes were developed to improve the effectiveness of these policies. RBS programmes focus on improving the attitudes, knowledge, skills, and practices of persons involved in serving alcoholic beverages (Toomey *et al.* 1998), with the primary goals of preventing intoxication and underage drinking. Some programmes include separate or extended training for managers on developing venue policies (Toomey *et al.* 2008a) such as providing positive incentives for preventing over-consumption (e.g. promoting food, setting cheaper prices for low- or no-alcohol drinks, avoiding price specials on alcoholic drinks) (Lang *et al.* 1998).

RBS is among the most widely implemented drinking context interventions (World Health Organization 2018, p. 110), reportedly more commonly in LMICs (87% of responding countries) than in HICs, although only 13% of responding countries required this training, and has been evaluated in countries that do not have a long history of alcohol policy research such as Brazil (Pantani *et al.* 2012) and South Africa (Peltzer *et al.* 2006). Numerous reviews (Bolier *et al.* 2011; Brennan *et al.* 2011; Jones *et al.* 2011; Rossow and Buvik 2017) concluded that most RBS programmes result in improved knowledge and attitudes among participants, although these effects may diminish over time (Buka and Birdthistle 1999). However, the evidence is mixed for impact on serving behaviour and on alcohol consumption and related problems.

Because of the limited and inconsistent effects of server training alone, programming was developed with a greater focus on management and house policies. Evaluation of this combined approach showed a significant reduction in service to intoxicated patrons (Toomey *et al.* 2008a) and significant uptake of policies and recommended practices (Lenk *et al.* 2018; see also Bolier *et al.* 2011); however, these effects also diminished over time. Despite these efforts to strengthen RBS training and policy interventions, Toomey and colleagues (2017) concluded that they are inadequate as the sole approach to reduce over-service of alcohol.

One problem with RBS is that it conflicts with the main mission of commercial licensed premises, which is to make money and ensure that patrons have a good time. Impediments to the success of RBS include financial incentives to overserve, poor motivation to learn and apply RBS strategies, liberal norms for intoxication, low priority of enforcing serving laws, and pressures of meeting customer demands during busy periods (Buvik and Rossow 2017; Buvik and Tutenges 2017).

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

Because RBS programmes tend to be highly variable in quality and coverage, evidence that one programme is successful does not necessarily mean that all versions of that or any other RBS programme will be successful. RBS programmes have also not addressed gender as a determining factor in serving to intoxication, despite evidence that bar staff are more willing to serve intoxicated women than men (Buvik and Baklien 2016).

In summary, despite their initial promise, RBS training and house policies are likely to have, at best, a modest short-term effect on alcohol consumption by patrons, and this effect will depend on the nature of the programme and the consistency of its implementation. Not only are the positive impacts of RBS limited, but there is also the risk that RBS may be adopted as a substitute for more effective approaches or used by industry to promote their own products (Pantani *et al.* 2012). Nevertheless, RBS training and policies may play an important role in multi-component interventions where RBS knowledge is supplemented by enhanced enforcement or other pressures to prevent over-service (see Sections 12.4 and 12.5 and Figure 12.1).

12.3.2 Interventions to better manage aggression and other problems

Interventions focused on violence and injury go beyond changing serving practices. Alcohol intoxication plays a causal role in aggressive behaviour (Bushman 1997), including violence in commercial drinking contexts (Graham *et al.* 2006). The environment, including aggressive bar staff and their inability to manage problem behaviour (Wells *et al.* 1998; Hobbs *et al.* 2003; Graham *et al.* 2005a; Liesbt *et al.* 2019), may also contribute directly to aggression, independent of the effects of alcohol on patrons. Because many problems cannot be prevented through changing serving practices (Graham and Homel 2008), specific training is needed for bar staff dealing with aggressive patrons.

Reductions in violence have been found from comprehensive community approaches that included interventions to train, and sometimes license, security personnel and other bar staff (see Section 12.5). The only free-standing programme designed to reduce violence by increasing staff's ability to prevent and manage aggressive behaviour that has been evaluated is *Safer Bars* (Graham *et al.* 2008). A large-scale evaluation found that *Safer Bars* improved knowledge and attitudes among staff (Graham *et al.* 2005b) and led to a statistically significant reduction in moderately, as well as severely, aggressive incidents, although the size of reduction was modest (Graham *et al.* 2004). The training has been successfully applied in other countries (Stevely *et al.* 2012), but no further outcome evaluations have been conducted.

Sexual assault in the form of unwanted sexual contact and harassment is highly prevalent in drinking venues (Graham *et al.* 2014). In response, numerous interventions have been developed in communities around the world to address this issue (e.g. https://safebars.org/). Recently, staff training programmes modelled on successful bystander training programmes (described under Section 12.2) have been developed, with preliminary research suggesting that this training can be effective in changing knowledge, attitudes, and willingness to intervene (Lopez 2018; Powers and Leili

2018), although the impact on the incidence or severity of sexual assault has not yet been demonstrated.

The evidence suggests that staff training programmes can reduce aggression in drinking contexts. Unlike RBS and other interventions focused on alcohol consumption, interventions to prevent aggressive behaviour do not necessarily conflict with the main mission of commercial drinking establishments, which is to make money-selling alcohol by facilitating enjoyment. These approaches have the potential to reduce harm and be welcomed by licensees, but they face cultural roadblocks (e.g. masculinity concerns, traditional drinking behaviours, gender roles) that may minimize their impact.

12.3.3 Interventions to address drinking contexts within sports venues and at festivals

High levels of intoxication and prevalence of overserving have been identified at sporting events (Toomey *et al.* 2008b; Durbeej *et al.* 2017; Elgán *et al.* 2018) and festivals (Feltmann *et al.* 2020). Evaluation of two interventions involving implementation of 19 alcohol control policies at festivals found no significant changes in serving to intoxication (Toomey *et al.* 2006), suggesting that, as with RBS approaches in drinking venues, RBS training and policies alone may be insufficient to effect change. Similarly, a study of sexual assault at music festivals also concluded that improvement in both policies and policing are needed for reduction of assault (Fileborn *et al.* 2020).

Consistent with the identified need for policy and enforcement, a comprehensive community-based approach that included enhanced enforcement in football stadiums in Sweden (described in Section 12.5) resulted in a significant reduction in service to intoxicated persons and intoxication levels of patrons. However, there was also a reduction in the comparison site, making the impact of the intervention difficult to interpret (Elgán *et al.* 2021).

Interventions focused on drinking by sports club members have shown mixed results. One intervention that involved club management in RBS training and house policies (Kingsland *et al.* 2015a) resulted in a significant reduction in heavy episodic and **hazardous drinking** among club members (Kingsland *et al.* 2015b). However, a second, mostly educational, programme found little evidence of effectiveness (O'Farrell *et al.* 2018).

12.3.4 Other venue-specific interventions

There is consistent evidence linking the drinking environment to alcohol consumption and alcohol-related problems such as violence. Accordingly, some programmes have included risk assessments to assist bars addressing contextual risks (see Graham and Homel 2008). No evaluations of the specific impact of risk assessments have been conducted. There is also no evidence that voluntary environmental risk assessments reduce violence, injury and, other harms (see, for example, Moore *et al.* 2017).

Interventions to eliminate risks from broken glass beverage containers suggest that non-glass containers (e.g. plastic, paper, metal) may increase safety (Forsyth 2008),

but that substituting tempered glass for regular glass is ineffective because tempered glass shatters when it breaks and can therefore increase injuries to bar staff (Warburton and Shepherd 2000).

12.3.5 Summary

RBS programmes can be effective in changing staff knowledge and behaviour, but there is mixed evidence about achieving ultimate outcomes such as reducing intoxication and other harms. Training staff to reduce bar room aggression has shown positive impacts, but evidence is limited in terms of stand-alone training programmes—the effect is modest and there is no evaluation of long-term impact. Bystander training to prevent sexual aggression has not been evaluated specifically for drinking contexts.

Preventing service to intoxicated persons has proven to be a particularly intransigent problem, one that is unlikely to be fixed simply by teaching servers how to recognize signs of intoxication or helping managers develop house policies to prevent intoxication, whether in a drinking venue or a licensed sports venue. Thus, venue-focused interventions, especially if these interventions require changes that are socially difficult to implement (e.g. it can be unpleasant for a server to refuse service) or financially disadvantageous, generally need to be supplemented by policing or community pressures that make the negative consequences of serving intoxicated persons greater than the positive consequences of serving them.

12.4 Policing and regulatory approaches

Policing and regulatory interventions use the possibility of regulatory sanctions (e.g. the threat of a licence loss or suspension) to influence licensed alcohol sellers to operate their businesses more safely. These interventions include enhanced enforcement, targeted policing, voluntary strategies, and other legal or regulatory approaches.

12.4.1 Enhanced enforcement of liquor laws and proactive policing

A study of increased enforcement of laws prohibiting the sale of alcohol to intoxicated patrons in one US state was associated with a significant decrease in serving intoxicated patrons and in alcohol-impaired driving (McKnight and Streff 1994), with estimated cost savings from fewer alcohol-involved crashes exceeding costs of enhanced enforcement (Levy and Miller 1995). An experimental study of combined enhanced enforcement and RBS training in two communities showed some positive impacts on the 14 consumption and driving-related outcomes measured, but the evidence was not consistent concerning overall improvement impact (Fell *et al.* 2017).

Proactive policing involving regular visits to licensees was found effective in reducing alcohol-related crime and arrests in some (Jeffs and Saunders 1983; Stewart 1993), but not all, studies (Burns *et al.* 1995), and the effects were not generally sustained beyond the period of enhanced policing (see review by Graham and Homel

2008). A study using civilian inspectors to supplement the police found increased compliance with regulations but did not show any impact on alcohol-related harms (Wilkinson and MacLean 2013).

12.4.2 Targeted policing

Targeted policing has also been used to modify the drinking context. One approach uses the place of 'last drink' to target high-risk premises by asking persons admitted to hospital or charged with alcohol-related offences where they consumed their last drink, and then focusing enforcement attention on premises mentioned frequently. The nature of 'attention' given to venues identified from last drink data has varied from offers of help in improving practices to punitive consequences. 'Last drink' data have also been used as part of multi-component programmes (e.g. Maguire *et al.* 2003) and for evaluating venue-focused interventions (Fell *et al.* 2017).

The Alcohol-Linking project which used the last drink approach in Australia (Wiggers *et al.* 2004) became a permanent part of policing in the trial area and ultimately state-wide (Wiggers *et al.* 2016) on the basis of its positive impact on alcohol-related offences, although the results from the randomized trial fell slightly short of statistical significance. A similar approach in Wales involved tracking last drink data from all violent injury presentations to emergency departments and combining these data with police intelligence to target policing to high-risk locations, including licensed premises. This approach resulted in a reduction in violent injury (Florence *et al.* 2011), and also led to widespread adoption of the approach in other jurisdictions (Mercer Kollar *et al.* 2020). However, a small demonstration project involving last drink data in the United States (Ramirez *et al.* 2008) found mixed evidence of impact on alcohol-related driving offences.

Targeted enforcement in the form of 'hotspot' policing (i.e. focusing on high-risk areas) has been associated with a reduction in crime in general; however, two evaluations focused specifically on drinking venues found no reduction in violence (Frogner *et al.* 2013; Fitterer *et al.* 2017).

In sum, 'last drink' data have become an important, and apparently effective, tool for focusing interventions on high-risk venues. Other evaluated approaches to targeting hotspots, however, have not shown significant impacts.

12.4.3 Voluntary and quasi-voluntary regulation and coordination

Voluntary and quasi-voluntary approaches to regulating licensed venues, such as codes of practice, involve licensees working with the police, local government, community groups, and other interested parties. These 'accords' (Australia, New Zealand) and accreditation programmes (Pubwatch, 'Best Bar None', United Kingdom) are intended to encourage venue operators to voluntarily adopt good practices such as limiting activities and promotions associated with alcohol-related harms (McCarthy 2007).

Although accords achieved some short-term positive effects (see Graham and Homel 2008) and provided a mechanism for community coordination (Manton

2014), accords and other voluntary approaches have not shown a consistent reduction of alcohol consumption or related harms, possibly due to reliance on voluntary compliance (Graham and Homel 2008), inconsistent implementation (Miller *et al.* 2014), and non-participation by more problematic venues (Curtis *et al.* 2016; Foster and Charalambides 2016).

Recently, coordinated approaches have become more focused on banning troublesome patrons from participating premises or designated areas or 'zones' such as a particular entertainment district (Palmer and Warren 2014). Many are police-led initiatives that are less 'voluntary' than original accords (Manton 2014) and include technologies such as ID scanners to coordinate patron banning with the police and other venues (Miller *et al.* 2016). Although popular, there is no evidence that patron banning reduces overall alcohol consumption or alcohol-related harms (Curtis *et al.* 2016; Taylor *et al.* 2018) and may even result in unintended harms (Søgaard 2018).

Although voluntary and quasi-voluntary approaches have limitations, there may be contexts or cultures where voluntary self-regulation is more appropriate, and possibly more effective, than formal regulation. One example is the Safe Shebeens project in South Africa. Shebeens are illegal and unregulated alcohol outlets. These outlets had become the focus of targeted policing because of associated violence and other problems (Herrick and Charman 2013), and formal policing had been found to be largely ineffective (Charman *et al.* 2013) because this policing disregarded the social, cultural, and economic importance of shebeens to the community (Charman *et al.* 2014). The Safe Shebeens project (described in Box 12.1) adopted a voluntary approach to engaging the community, with preliminary results suggesting some improvements in the drinking environment (Ntshingila and Petersen 2015).

12.4.4 Risk-based licensing

Risk-based licensing (RBL) applies criteria whereby liquor licensing conditions, including fees in some jurisdictions, are based on an assessment of factors likely to increase the risk of alcohol-related harm. Risk factors include venue capacity, lack of staff training, history of infractions, late trading hours, and outlet density of the area (Fitterer *et al.* 2018; Miller *et al.* 2020).

RBL has the potential advantages of administrative efficiencies by focusing on higher-risk premises and of using RBL as a vehicle to recoup policing costs or fund more extensive policing, regulating, and inspecting (Miller *et al.* 2020). However, the rewards and punishments typically applied in most jurisdictions where RBL is used may be inadequate to produce meaningful change (Nepal *et al.* 2019). At present, there is little evidence of effectiveness of RBL (e.g. Curtis *et al.* 2019a).

12.4.5 Legal liability of servers, managers, and owners of licensed premises

Dram shop liability laws in the United States allow individuals in some states who are injured by an underaged or intoxicated individual to recover damages from the owners

Box 12.1 Safe Shebeens project

The Safe Shebeens project was developed in Sweet Home Farm, a poor community with high unemployment and poor infrastructure in the Western Cape Province of South Africa. Although much of the social life takes place at shebeens (informal alcohol outlets), Sweet Home Farm is an informal settlement where residents do not own property and cannot obtain a liquor trading licence; thus, shebeens are illegal, unregulated, and associated with problems, including violence. Shebeens, however, are also a major source of income, especially for women. Prior to the project, 315 shebeeners (shebeen operators) were surveyed to identify characteristics, functions, and problems of these venues (Herrick and Charman 2013). The survey suggested that many shebeeners were motivated to make their venues safer because they, as well as their patrons, had been victims of violence.

The Safe Shebeens project used participatory action research, involving three stages:

1. A community survey of 166 individuals over age 18 to engage the community and identify positive roles of shebeens in the community, as well as negative impacts of shebeens.
2. One-day workshops with each of three groups (ten residents older than 35 years, 11 young men and 12 young women) to identify safety issues, safe locations (using a mapping tool), and attitudes toward drinking and shebeens.
3. Working with 23 shebeeners to help them to adopt potential control mechanisms (e.g. house rules, physical safety measures such as lighting, controlling noise and urination, banning unruly patrons) to address safety issues raised by community members; this also included developing signage to indicate which control mechanisms were in place.

The project resulted in a Safe Shebeens strategy with three core components:

1. A participatory process of engagement with shebeeners.
2. A Safe Shebeens toolkit for shebeeners.
3. A process building awareness for consumers.

Informal evaluation noted enthusiasm from shebeeners, with some adopting control measures. Shebeeners also shared effective strategies and created a forum for cooperation on safety measures. A 1-year follow-up with some of the participating shebeeners found that all had increased the number of safety controls in their premises. Similarly, an increase was found in amenities such as using beer crates to store stock and adding a fan, jukebox, electrical connection, and cooking facilities/food service to the premises. The project was less successful at addressing community concerns such as noise from music and operating with unfixed operating hours. A key learning from the project was the importance of using indigenous knowledge; for example, a simple shelf added along the side wall of a shebeen provided a ledge on which patrons could store drinks, thereby minimizing conflict when drinks were spilled accidentally (Ntshingila and Petersen 2015). The project has served as a model for improving safety in drinking contexts in other countries (http://www.sekika.co.za/responsible-trade-facilitation/).

Source: Project description reproduced from the Safe Shebeens Project Narrative Report http://livelihoods.org.za/wp-content/uploads/2018/05/Safe-Shebeens-Narrative-Report.pdf

and employees of venues where the person causing the injury was served (Mosher *et al.* 2002). A systematic review (Rammohan *et al.* 2011) concluded that states with dram shop laws had fewer traffic fatalities and other alcohol-related driving harms, with later research confirming this impact on young drivers (Scherer *et al.* 2015). The impact of dram shop laws appears to be mediated by their effects on the attitudes and behaviour of bar owners and staff (Sloan *et al.* 2000). Although research is mostly from the United States, a few successful cases have been documented in Canada and Australia (Solomon and Payne 1996).

12.4.6 Regulatory approaches focused on specific aspects of public drinking

Communities often adopt policies to address a specific problem in nightlife districts. For example, 'lockouts' became popular in Australia to prevent street violence and other problems that occur when intoxicated individuals go from one venue to another later in the night. Lockout regulations allowed patrons to continue to buy alcohol if they remained in the same venue after a certain time, but prohibited them from entering a different venue or returning to the same venue once they had left. These policies are so often part of multiple intervention initiatives (Kypri *et al.* 2011) that the term 'lockout' in Australia often refers to a whole package of measures limiting late-night alcohol sales (e.g. earlier closing times; see Chapter 8). Although lockouts in the restricted sense have been implemented in various centres in Australia, there is no consistent evidence of their effectiveness independent of other interventions (Taylor *et al.* 2018).

Banning high-alcohol drinks ('shots') after a certain time has also been implemented to reduce late-night problems. An analysis designed to separate the impact of this intervention from others implemented at the same time found no evidence that banning high-alcohol drinks independently reduced police-recorded assaults (Taylor *et al.* 2019).

12.4.7 Multi-component policing/regulatory interventions

Multi-component interventions combine interventions already described in this chapter with interventions covered in other chapters (e.g. modifying trading hours, alcohol pricing, and drink promotions). This multiple focus makes it difficult to identify the particular component(s) responsible when the overall intervention achieves a positive outcome. Unlike comprehensive approaches (described in Section 12.5), these interventions are usually implemented by a single agency, typically the police or state licensing authority, rather than by a local group of stakeholders. One early example, the police-led 'Tackling Alcohol-related Street Crime' (TASC) project, showed a mixed impact, but it was limited by the short time frame and incomplete implementation of many components (Maguire *et al.* 2003; Warburton and Shepherd 2006).

Several multi-component interventions implemented by the community or state have been evaluated as **natural experiments**. Research comparing two

multi-component interventions in Australia (Miller *et al.* 2014) involving enhanced policing and voluntary measures in both communities, but earlier closing in only one, found significant reductions in alcohol-related injury, assaults, and self-reported intoxication of patrons only for the intervention that included earlier closing times. A large-scale multi-component project in Australia that also included earlier closing times found significant reductions in assaults and injuries overall (Miller *et al.* 2019). However, evaluation of the impact of the intervention on patron pre-drinking (i.e. drinking prior to going to a commercial establishment) in specific night-time entertainment districts found conflicting results (Coomber *et al.* 2018; Devilly *et al.* 2019).

12.4.8 Summary and considerations

There is some evidence that targeted policing, legal liability, and enhanced enforcement of laws and regulations can reduce harms in drinking venues by increasing the chances that venues with bad alcohol management practices will be caught and punished. However, mixed evaluation results suggest that their effectiveness depends on the content of programming (including severity of consequences for violations) and its implementation.

Coordinated voluntary and quasi-voluntary regulatory approaches have shown limited success in reducing alcohol consumption or harms but may be useful in clarifying expectations about standards of behaviour, gaining support for more effective approaches, providing a platform for coordination, and as a component of comprehensive community approaches (Trolldal *et al.* 2012). Voluntary approaches may also be important when formal policing and regulation are rooted in racism and colonialism, as was found for the shebeens in South Africa (Drivdal and Lawhon 2014).

Other regulatory strategies such as risk-based licensing and lockouts show promise, but there is no evidence that these strategies reduce alcohol consumption and harms. As with enhanced enforcement and proactive policing, their impact may depend, at least partly, on the severity and immediacy of sanctions for violations.

12.5 Comprehensive community-level approaches

Community-level approaches to changing the drinking context are usually directed toward a specific geographic entity (e.g. city, district, college campus) and may extend to addressing broader issues beyond venues such as street safety (e.g. lighting, transportation). Like multi-component regulatory-focused interventions, comprehensive community approaches include components at various levels (individual, venue, policing, and regulatory), but they differ in that they require and gain power from a coordinated effort that includes commitments from community stakeholders.

12.5.1 Multi-component community-wide approaches

Usually a specific person or organization (e.g. community coordinator for researcher-led projects) assembles a coalition of local government, regulators (e.g. licensing authorities), police, venue managers, and other stakeholders. The coalition promotes, supports, and implements decisions. Typical interventions include bar staff training (e.g. RBS, aggression prevention training), enhanced enforcement, media coverage, and advocacy.

Most comprehensive community projects require considerable resources but can also have a substantial impact. However, sustaining the impact beyond the life of the project has been a problem. For example, the Rhode Island Community Alcohol Abuse/Injury Prevention Project in the United States (Putnam *et al.* 1993) was associated with decreases in motor vehicle crashes and assaults, but follow-up data indicated that enhanced enforcement, a key component of the project, was not maintained after the project ended (Stout *et al.* 1993).

The Surfers Paradise Safety Action Project (Homel *et al.* 1997) and its replications (Hauritz *et al.* 1998a) were designed to reduce violence and disorder associated with the high concentration of licensed establishments in several Australian locations. These projects resulted in significant improvements in practices and significant reductions in violence (Hauritz *et al.* 1998b), but, like the Rhode Island project, they were not able to demonstrate long-term sustainability (Graham and Homel 2008).

A project focused on weekend safety in ten intervention communities in Australia included coordinated community efforts, increased police presence, pressure from the mayor, and increased police visibility. Compared with ten control communities, an evaluation found a significant reduction in alcohol-related sexual assaults, but no impact on alcohol-related assaults generally (Navarro *et al.* 2013).

The STAD (Stockholm Prevents Alcohol and Drug Problems) project in Sweden is the most successful sustained community initiative to date (Wallin *et al.* 2002, 2003, 2005). As described in Box 12.2, the project resulted in significant changes in serving practices and significant reductions in violence. STAD's success appeared to be attributable to its long time frame, high participation from key leaders and stakeholders, ongoing activities including training, sustained police and licensing enforcement, and media coverage demonstrating progress (Wallin *et al.* 2004).

An analysis of the adoption of STAD by other communities in Sweden between 1996 and 2009 (Trolldal *et al.* 2012), outside of the original experimental context, found a significant reduction in police-recorded assaults, although the effect was weaker than that of the original STAD, and the reduction in assaults was significant only in smaller communities. Analysis of the main components of the programme (RBS training, steering group, enhanced enforcement) found that all three were related to a reduction in assaults, but only the presence of a steering group was significant. And a later paper on the effects of local alcohol prevention efforts in Swedish municipalities found that the level of prevention efforts, particularly in terms of fewer alcohol sales licences and more inspections of them, was related to reductions in alcohol-related harms, including mortality (Nilsson *et al.* 2020). A programme similar to STAD was piloted in

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Box 12.2 Stockholm Prevents Alcohol and Drug Problems (STAD) project

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This 10-year project was implemented in the northern part of central Stockholm (550 licensed premises), with the southern part serving as the control area (270 premises). The first part of the project included a survey of licensed premises and research documenting the extent of service to intoxicated persons. Led by an action group consisting of representatives from the county council, the licensing board, the police, public health, and bars and restaurants, the project included: (1) a 2-day training course in responsible beverage service and conflict management for servers, security staff, and owners; and (2) enhanced enforcement by the Licensing Board and the police. A critical step in the project's evolution was the signing of a written agreement by high-ranking officials specifying how responsibilities for different parts of the intervention were to be distributed among participating organizations (Wallin *et al.* 2004).

The project appeared to gain momentum over time. Refusal of service to intoxicated persons increased from 5% in 1996 to 47% in 1999 and 70% in 2001 (Wallin *et al.* 2002, 2005). Although improvements in refusal of service also occurred in the control area, the refusal rate was higher for RBS-trained premises in the intervention area. A 20-year follow-up found that 77% of pseudo-patrons (actors pretending to be intoxicated) were denied service of alcohol, compared to 5% at baseline in 1996 and 70% in 2001 (Gripenberg *et al.* 2017).

The reduction in violent crimes was estimated at 29% for the intervention area, compared to a slight increase in the control area (Wallin *et al.* 2003); later reanalysis of the data indicated that the effect on violence was strongly significant (Norström and Trolldal 2013). Analyses also suggested that the overall programme was cost-effective (Månsdotter *et al.* 2007).

The success of the project seemed to be largely due to the commitment to a 10-year time frame; strong support from the action group members, especially the head of the licensing board; positive media coverage; evidence of effectiveness provided by research data; and sustained, and even increasing, enforcement activity by police.

Finland (PAKKA) and found a significant reduction in service to intoxicated pseudo-patrons, but there was no impact on violence (Warpenius *et al.* 2010).

12.5.2 STAD in Europe

Based on the success of STAD, a multi-country project was undertaken, with a specific focus on heavy episodic drinking among young people. Each of the seven participating countries addressed young peoples' drinking in different ways and in different drinking settings (e.g. licensed premises, festivals, public environments such as streets and parks, private environments such as the home). The same 7-step comprehensive community approach was used in all countries: (1) identifying the implementation area, setting, and target group; (2) assigning a coordinator; (3) connecting with the community; (4) performing a needs assessment; (5) partnership formation and

community mobilization; (6) implementing training and enforcement; and (7) monitoring and evaluation (p. 25, http://stadineurope.eu/wp/wp-content/uploads/2019/04/StadInEurope_manual.pdf).

The extent of community support for the STAD in Europe (SiE) projects (http://stadineurope.eu/project/) varied considerably between countries. None of the projects had the high-level long-term support of the original STAD. For example, the project in Slovenia had minimal uptake of training from venue owners and the police refused to be involved; not surprisingly, the project showed no impact. The initial results for projects that focused specifically on the drinking context found positive changes for some outcomes, but not for others (Durbeej *et al.* 2016; Quigg *et al.* 2018; Elgán *et al.* 2021). Quigg *et al.* (2019) have identified factors that both facilitated and created barriers for the interventions. Although the projects provide some evidence of the feasibility of implementing STAD-like interventions in other cultural contexts (especially nightlife, festival, and sports settings), there is currently insufficient evidence of similar impact and sustainability to that achieved by STAD.

12.5.3 Community approaches focused on specific target populations

The Sacramento Neighborhood Alcohol Prevention Project (SNAPP) evaluated the effectiveness of a community approach in two high-crime neighbourhoods in the United States (Treno *et al.* 2007). The study found a reduction in serving to minors, but not in serving to intoxication, and reductions in crime compared to the broader community (this latter finding may have been due to the initial higher crime rate in the intervention communities, making it easier to show a reduction in crime than was possible in communities where the crime rate was low to begin with).

The Neighborhoods Engaging with Students (NEST) project, led by a community coalition of stakeholders, included enhanced enforcement, education, and activities to reduce disruptive off-campus parties in a US city (Saltz *et al.* 2009). Evaluation indicated a significant reduction in heavy drinking and missing class or work, but other outcomes were not significant. A similar community intervention in Sweden specifically focused on student parties was associated with a significant reduction in violence-related emergency room visits (Ramstedt *et al.* 2013).

12.5.4 Summary

Comprehensive community projects focused on drinking contexts have proved to be an effective strategy for reducing alcohol-related harms, possibly because these broad multi-component approaches are able to address many components of the crime prevention theory (Cornish and Clarke 2003), including the need for expanding the role of guardianship, implementing numerous situational deterrents, and eliminating some precipitators of violence and other problems. However, these projects require long-term commitment, including enhanced and sustained enforcement. They also require extensive resources, although one study found that this investment in prevention was cost-effective (Månsdotter *et al.* 2007).

Because community projects involve multiple components, it has not been possible to identify the most effective combination of interventions. The most effective combination of components is also likely to vary by context and culture. For the Rhode Island and the STAD projects, the role of enforcement appeared to be key. On the other hand, enforcement played a lesser role in the Queensland projects (Graham and Homel 2008), suggesting that other aspects, such as training of staff, social pressure on licensees, community involvement, and a combination of formal and informal regulation, were key elements.

In comprehensive community projects, individual components can enhance and reinforce one another, especially when there is high-level support, active coordination, and favourable publicity. For example, RBS training may have greater impact if accompanied by well-publicized enforcement of regulations. It is also essential, as in prevention approaches generally, that community initiatives maximize the use of evidence-based interventions.

A limitation of comprehensive community approaches is that they require considerable political will to initiate and implement. Although research suggests there is general community support for alcohol interventions (Tindall *et al.* 2016; Skoglund *et al.* 2017), social drinking venues often provide considerable financial and social benefit that the community may be unwilling to lose. Thus, communities may only be willing to take action when problems become highly salient, such as when a well-publicized death or sexual assault occurs at a licensed drinking venue. It is often easier to implement a single targeted intervention than to make a long-term commitment to a comprehensive community approach, despite the greater likelihood of impact from the comprehensive approach.

12.6   Conclusion

Interventions to modify the drinking environment are popular and will likely remain so. Nevertheless, these interventions rarely work as 'off-the-shelf' models, but rather must be understood and adapted, based on their underlying characteristics and the principles that likely account for their effectiveness, which will vary not only according to the characteristics and implementation of the intervention, but also depending on the context in which the intervention is implemented.

As described in this chapter, interventions that aim to reduce alcohol consumption or problems occur at different levels within that context—individual drinkers, drinking venues, and the policing and regulatory environment. As summarized in Table 12.1, each level has advantages and disadvantages.

Effectiveness of interventions will vary by the content of the intervention, how it is implemented, and the cultural context in which the intervention is applied. For example, the impact of enhanced police enforcement may vary with the consequences to violators, the consistency of implementation, and the cultural context in which the police operate. Voluntary participation is key to some interventions. Venue-focused interventions are unlikely to be successful if participation conflicts with the venue's culture or appears to be financially disadvantageous (Moore *et al.* 2012). Similarly, active support of key stakeholders is critical to the success of comprehensive community approaches.

Table 12.1 Advantages and disadvantages of interventions to modify the drinking context by level of focus of the intervention

Focus of intervention	Advantages	Disadvantages
1. Individuals in the drinking context	• Can be applied to a variety of social drinking contexts • Addresses sexual violence, as well as other forms of gendered violence • Easily directed toward at-risk populations, e.g. young adults • Taps into feelings of responsibility for others in the drinking group	• High use of resources relative to number of individuals affected • Little evaluation of ultimate impact on harms and of sustainability
2. Drinking venues	• Several interventions have been extensively evaluated • Can set clear standards for serving staff and management • Can be reinforced with interventions at other levels such as enforcement	• May be ineffective unless combined with other interventions such as enforcement • Implementation may be affected by the culture of venue staff and drinkers • Impact may fade over time without reinforcement
3. Enforcement and regulations	• Able to reinforce less harmful environments and practices and deter or punish more harmful ones • Can reflect community standards and expectations • Can target specific risk factors across multiple venues	• Impact may depend on nature of consequences • Political will is needed for sustainability
4. Comprehensive community[a]	• Can produce large benefits, especially if there is long-term commitment from high-level regulators • Facilitates synergies among different interventions	• May be difficult to gain long-term support from key stakeholders • Often requires substantial resources
5. Context-focused interventions generally	• Able to adapt to local context • Can focus on problem venues or contexts • Can target specific harms (e.g. drink-driving, sexual violence, injury) more easily than other interventions such as taxation and pricing • Able to be modified for different cultures and changing circumstances within the same culture	• Effectiveness will depend on content, implementation, and culture, so evaluation results from one context do not necessarily mean intervention will be effective in another context • Generally require more resources than simple policy changes such as pricing or hours of sale

[a] Includes advantages and disadvantages from the other three levels.

Despite limitations in evaluation research, there are some conclusions that can be drawn about the effectiveness of each intervention. Table 12.2 shows ratings of the effectiveness of interventions in terms of reducing alcohol consumption or alcohol-related problems and the breadth of research on which the ratings are based. It should be noted that intermediate outcomes are not shown in this table. For example,

Table 12.2 Consensus ratings of effectiveness and breadth of research support for interventions modifying the drinking context[c]

	Effective-ness[a]	Breadth of research support[b]	Comments
Peer-focused interventions	+/0	+	Reduced sexual victimization of women, increased protective actions toward others and a reduction of some forms of aggression, but no impact on aggression generally. Mixed findings for effects on alcohol consumption
Services to assist bar-goers as they leave the bars	?	+	Limited research, weak effects from two studies pertaining only to some outcomes. Although the results are promising, they are insufficient for a positive rating of effectiveness, given inconsistencies in findings, heterogeneity of programming, and relatively small amount of research
Staff and management training and house policies relating to responsible beverage service (RBS)	0	+++	Most programmes are able to change knowledge and short-term serving practices. Although some interventions have shown reductions in consumption or alcohol-related problems, especially when combined with enforcement or as part of a comprehensive community approach, effects on consumption and alcohol-related harms are not likely with RBS alone
Staff and management training to better manage aggression	+	+	Evidence of impacts on aggression currently limited to one randomized controlled study and supportive results from multi-component, community-wide programmes
Interventions to address drinking contexts in sports venues/events and at festivals	0	+	RBS training and policies in sports venues can change knowledge and venue policies. Mixed evidence of impact on alcohol consumption
Enhanced enforcement of on-premises laws and legal requirements and proactive policing	+	++	Generally positive impacts on consumption and alcohol-related crimes and driving, but not for all outcomes. Sustained effects depend on making enhanced enforcement part of ongoing police practices

Table 12.2 Continued

	Effective-ness[a]	Breadth of research support[b]	Comments
Targeted policing	+	++	Some positive outcomes for 'last drink' approach on alcohol-related offences and injury and potential for making part of routine policing, but no impact of 'hotspot' policing. Impact may depend on the nature of interventions with targeted premises
Voluntary and quasi-voluntary regulation and/or coordination	0	+	Ineffective when strictly voluntary but may provide foundation to build upon when other options are not feasible
Legal liability of servers, managers, and owners of licensed premises	++	+	Effects shown for alcohol-related driving outcomes; effects stronger where efforts made to publicize liability. Research limited to United States
Regulatory approaches focused on specific aspects of public drinking (e.g. 'lockouts', restrictions on late-night drinks)	?	+	Mixed findings, with no consistent evidence of effectiveness on reducing venue-related violence and other problems as the sole intervention; usually implemented as part of multi-component interventions
Multi-component, community-wide approaches to implement and enforce effective policy	+/?	++	Projects in Sweden, United States, and Australia showed significant reductions in violence and some other alcohol-related problems; no clear evidence of impact on consumption. Application of the approach to young people's drinking in Europe had variable results. Extent of impact depends on quality and intensity of interventions and local buy-in. Sustainability is difficult to achieve
Community approaches focused on specific target populations	+	+	Limited research showing some positive impacts on both consumption and problems

[a] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ Evidence of a strong effect on consumption or problems; ? One or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[b] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include LMICs; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in LMICs.

Note: The following types of interventions were excluded from the table because of lack of well-designed evaluation: other venue-specific interventions (risk assessment, alternative beverage containers); risk-based licensing; context-focused interventions implemented as part of multi-component interventions. Also, bystander intervention training focused on individual drinkers was excluded from the rating table because there has been no outcome evaluations specific to drinking contexts.

[c] For further information, please see ⬚ Online Appendix 1

evaluation of RBS has shown fairly reliable positive impacts on knowledge or behaviour of servers, but there is no consistent evidence of sustained impacts on alcohol consumption or alcohol-related problems.

As shown in the table, there is evidence that some of the individual- and venue-focused approaches (i.e. peer interventions, training in preventing aggression) have a modest impact on some alcohol-related problems; however, interventions at these levels tend to be resource-heavy and will be highly dependent on the quality and implementation of the programme and other cultural and contextual factors.

Policing approaches (enhanced enforcement and targeted policing) have shown some positive impacts but involve moderate costs, and the effects are unlikely to be sustained unless incorporated into ongoing policing practices. The regulatory approach of making servers legally liable for harms by persons they have served has been associated with reduced alcohol problems, but there is no evidence of its effectiveness outside the United States. Voluntary approaches and regulations targeting specific aspects of the drinking context have not shown clear evidence of effectiveness.

Comprehensive community approaches are the only interventions that have shown large **effect sizes**, but, as demonstrated by STAD in Europe, these approaches can only succeed if they achieve strong involvement of community leaders and stakeholders and include effective components. Few community projects have been able to demonstrate long-term sustainability of impact.

For many context-focused interventions, the breadth of research support, particularly in low- and middle-income countries, is limited. And most do not have broad population reach, although they are capable of reaching specific high-risk groups.

Despite the limitations of impact and reach, there are nevertheless some key advantages of interventions directed toward reducing alcohol consumption and/or problems by modifying the drinking context. These include being able to target specific venues and specific types of alcohol-related harms. In addition, multiple approaches can be applied at the same time (e.g. training, enforcement, reduction of environmental risk factors), and the mix of interventions can be designed to meet the specific needs of each community. Finally, most approaches targeting high-risk drinking contexts are perceived as acceptable in most cultures and may be easier to implement than strategies such as higher taxation or changes in alcohol availability. Measures to reduce harm in the drinking situation are thus a useful element in the mix of strategies for preventing alcohol-related problems.

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13

Treatment and early intervention services

13.1 Introduction

Alcohol policies are primarily the concern of local, regional, and national governments, which often view the provision of treatment as part of a comprehensive approach to alcohol-related problems. In addition to its value in the restoration of a person's psychological and physical health, treatment can be considered as a form of prevention. When therapeutic interventions occur soon after the onset of **hazardous drinking**, it is called secondary prevention. When treatment is initiated to control the damage associated with chronic drinking, it is called tertiary prevention. As one of the first societal responses to alcohol problems, treatment interventions have been evaluated in terms of their impact on the individual drinker, but less research attention has been devoted to their ability to reduce the rates of alcohol-related problems in the general population, despite the resources they consume.

This chapter describes the scientific basis of alcohol treatment policies in terms of research on the effectiveness and costs of a wide range of treatment interventions and related services. By treatment policy, we mean governmental and civil society actions that affect the provision of treatment services, the allocation of resources, and the optimal mix of services for the management of alcohol use disorders. In some jurisdictions, alcohol and other drug services are administered separately; in others, they share the same programmes and facilities. In some countries, these services are part of the system of medical care, whereas in others, they are integrated with social work or psychiatric services. All of these arrangements have implications for the efficiency and effectiveness of alcohol treatment. Although there are descriptions and some comparisons of national and local alcohol treatment systems, there has been little research on effectiveness at the treatment system level. In this chapter, we consider the organization and functioning of treatment programmes, **brief intervention services**,[1] and **mutual help organizations** as important parts of systems of care, and whether service systems have an impact on the rates of alcohol-related problems at the population level.

While there was substantial provision of specialized treatment services for alcohol problems in several countries prior to the First World War (Baumohl and Room 1987), almost none of these services survived into the modern era. In many parts of the industrialized world, new kinds of programmes were set up after the Second World War, with many countries, especially those having a high prevalence of alcohol problems,

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

investing in a variety of services, often in conjunction with treatment for other drug problems (Klingemann *et al.* 1992; Klingemann and Hunt 1998).

In the United States, a country with an extensive network of services, there were 17,808 facilities providing treatment for drug and alcohol disorders in 2019, with 90% managing clients diagnosed with alcohol use disorders (Substance Abuse and Mental Health Services Administration 2020). Most of the facilities are operated by private non-profit organizations (60% of all facilities) or private for-profit organizations (40% of facilities), although the services provided are more often than not funded by one or more levels of government. A point prevalence survey reported 205,402 clients with alcohol abuse being treated at 9123 facilities, and an additional 476,065 clients with both alcohol and drug abuse (Substance Abuse and Mental Health Services Administration 2020). Elsewhere in the world, services are often run by government agencies, usually as part of the health care system, but also as part of welfare or other social service systems. Two-thirds of services in Sweden, for instance, are provided through the welfare, rather than the health, system, though not all of the services paid for by governments are government-run.

A World Health Organization (WHO) survey (Babor and Stenius 2010) indicates that services have been organized wherever the incidence of alcohol and drug use is increasing, even in historically abstinent countries in the Eastern Mediterranean (Babor 2018). Nevertheless, treatment coverage (i.e. the proportion of persons with alcohol use disorders who are in contact with treatment services) varies substantially across WHO Member States. According to a WHO global survey of Member States (World Health Organization 2018, p. 93), only 14% of responding countries reported high amounts of treatment coverage, whereas 28% indicated limited or no treatment and many low-income countries were not able to provide data on this topic.

13.2 Services and systems of care

Health and social services for alcohol problems typically involve screening, brief interventions, referral advice, diagnostic evaluation, detoxification, therapeutic interventions, and continuing care. Numerous therapeutic approaches, called treatment modalities, have been evaluated by means of randomized clinical trials. Examples include motivational interviewing, **marital and family therapy**, cognitive behavioural therapy (CBT), **relapse prevention** training, **contingency management**, pharmacotherapy, and interventions based on the Twelve Steps of Alcoholics Anonymous (AA). These modalities are delivered in a variety of settings, including primary health care, freestanding residential facilities, psychiatric and general hospital settings, outpatient programmes, and more recently through digital technologies via the Internet. Treatment services in some countries have been organized at the municipal and national levels into systems, a term that refers to linkages between different facilities and levels of care and to the integration of alcohol treatment with other types of services such as mental health, drug dependence treatment, and mutual help organizations (Klingemann *et al.* 1993; Klingemann and Klingemann 1999).

Most treatment research and the scientific evidence derived from it is component-based, focusing on the effects of a single intervention or episode of care within a single

component of the treatment system (e.g. outpatient treatment). In general, the research evidence can be organized according to three types of intervention: (1) brief interventions for non-dependent high-risk drinkers; (2) formal treatment for problem drinking and alcohol dependence; and (3) mutual help interventions.

13.3 Interventions designed for non-dependent high-risk drinkers

Harmful drinking typically precedes the development of alcohol dependence, and by definition, it can cause serious medical and psychological problems in the absence of dependence. With the increased interest in clinical preventive services in both developed and developing countries, early intervention programmes have been developed by the WHO and national agencies to facilitate the management of harmful drinking in primary health care and other settings. Following an initial screening to identify risk levels, the patient is referred to either a brief intervention or more intensive specialized treatment. Brief interventions are characterized by their low intensity and short duration, consisting of one to three sessions of counselling and education. The aim is to motivate high-risk drinkers to moderate their alcohol consumption or to reduce the risk of drinking-related harm, rather than to promote total abstinence, and to refer more serious cases to appropriate treatment, typically with an abstinence orientation.

During the past two decades, numerous randomized controlled trials have been conducted to evaluate the efficacy of brief interventions in primary health care and other health care settings. Cumulative evidence from systematic reviews and meta-analyses (Kaner *et al.* 2018) shows that clinically significant reductions in drinking and alcohol-related problems can follow from brief interventions. Nurses and other health care providers are as effective as doctors in producing behaviour change, and the positive effects have been observed with adolescents, adults, older adults, college students, and pregnant women. Despite the evidence of benefit from this kind of intervention, difficulties are often encountered in persuading practitioners to deliver such care. Evaluations of programmes and policies to stimulate the uptake of alcohol screening and brief intervention (SBI) for risky alcohol consumption suggest limited success in implementation (Nilsen *et al.* 2006; Williams *et al.* 2011; McCambridge and Saitz 2017). The effectiveness of implementing SBI delivery increases when programmes include multiple components (Anderson *et al.* 2004), contain higher intensity of effort (Nilsen *et al.* 2006), and focus on general practitioners and mid-level professionals simultaneously (Williams *et al.* 2011). The ODHIN trial (Anderson *et al.* 2016) tested eight strategies to promote SBI in primary health care units in five European countries, finding that financial incentives to provider organizations were key although they needed to be reinforced by training and support.

Digital technologies have also been applied to improve the delivery of SBI and referral to treatment. SBI delivered via computer and phone provides effective delivery of interventions in both educational and health care settings and may prove to be more acceptable than traditional (face-to-face) approaches (Donoghue *et al.* 2014).

With increasing use of mobile and digital technologies for treatment and brief interventions, population coverage can be increased and the cost of delivery reduced.

13.4 Specialized treatment for persons with alcohol use disorders

In countries with well-developed health care systems, the range of agencies and professional service providers involved in specialist treatment of alcohol-related problems is extensive. Some of the key issues that treatment research has addressed with increasing scientific rigor include the effectiveness of different detoxification measures, treatment settings and therapeutic modalities, as well as mechanisms of behaviour change and the role of coerciveness.

13.4.1 Detoxification

Detoxification services are mainly directed at patients with a history of chronic drinking (especially those with poor nutrition) who are at risk of experiencing withdrawal symptoms as part of an alcohol **withdrawal syndrome**. Such services usually involve a bed and some vigilance to watch for, and respond to, seizures but need not involve hospitalization (Fernandez 2019). Administration of thiamine and multivitamins is a low-cost, low-risk intervention that prevents alcohol-related neurological disturbances, and is typically combined with supportive care and treatment of concurrent illness. A variety of medications have been used for the treatment of alcohol withdrawal, but benzodiazepines, especially diazepam and chlordiazepoxide, have largely supplanted all other medications because of their favourable side effect profiles (Kattimani and Bharadwaj 2013); anticonvulsants, especially phenobarbitals, are equally effective (Hammond *et al.* 2017). There can be no doubt that monitoring of vital signs and treatment that obviates the development of the most severe withdrawal symptoms can be lifesaving.

13.4.2 Treatment settings and delivery technologies

Traditionally, residential care has been the preferred setting to manage the needs of persons with alcohol use disorders, but as services have expanded and new therapeutic techniques and technologies have been introduced, there has been a shift to outpatient settings. Residential treatment continues to be used in many countries for persons with severe alcohol dependence who do not respond to more limited efforts at rehabilitation. The term residential rehabilitation describes a multitude of programmes that differ in philosophy, intensity, client characteristics, programme content, and duration. While residential treatment can operate in a more collective fashion, for instance as a '**therapeutic community**' (De Leon 2000), often the only common factor is that residents have to stay overnight at the facility to receive treatment and are expected to be alcohol-free when they start the programme. While a considerable body

of research has evaluated residential treatment, the quality of earlier studies has been poor. A review of more recent studies published between 2013 and 2018 (de Andrade *et al.* 2019) found that residential treatment is an effective intervention for many adults with alcohol and other substance use problems. Overall, there was moderate-quality evidence that residential treatment is effective in reducing substance use and improving mental health, and some evidence that treatment may have a positive effect in reducing crime and adverse social outcomes. In most comparative studies, outpatient programmes have been found to produce outcomes comparable to those of residential programmes, although some patients may benefit more from residential treatment because of their medical and psychiatric problems (Finney *et al.* 1996; de Andrade *et al.* 2019).

The widespread use of computers, the Internet, and smartphones has led to the development of electronic systems to deliver screening, brief interventions, and behaviour therapies. The application of these technologies can potentially address the barriers to implementation of traditional face-to-face SBI and outpatient therapy. Because of their flexibility and anonymity, they have the potential to reach a larger proportion of the population in need of services. Systematic reviews have found Internet-based treatments and SBIs to be as effective in reducing alcohol consumption as outpatient face-to-face treatments (Donoghue *et al.* 2014; Riper *et al.* 2018).

13.4.3 Therapeutic modalities: behavioural and psychosocial approaches

In both residential and outpatient settings, a variety of therapeutic modalities have been adopted to treat the patient's drinking problems, promote abstinence from alcohol, and prevent relapse. The approaches with the greatest amount of supporting evidence are behaviour therapy, group therapy, family treatment, and motivational enhancement (Babor et al. 2015). Mutual help interventions, and therapies derived from them, are considered below (see Section 13.5). Behavioural approaches include marital and family therapy, skills training, relapse prevention, and contingency management. The last-named involves repeatedly testing a patient to verify sobriety and giving them a reward or incentive so long as the test shows that they have been abstinent. Studies (Koffarnus *et al.* 2018) have shown that these non-pharmacological interventions are effective ways to reduce problem drinking and promote abstinence, although positive treatment outcomes have rarely been evaluated beyond 1 year after the end of treatment and relapse rates are high, even within that time frame.

13.4.4 Therapeutic modalities: pharmacologic interventions

Another treatment approach, often combined with behaviour therapy and group therapy, is use of alcohol-sensitizing drugs, as well as medications to directly reduce drinking and treat co-morbid psychopathology (Kranzler 2000). Alcohol-sensitizing drugs, such as disulfiram (Antabuse) and calcium carbimide, cause an unpleasant physical reaction when alcohol is consumed. These drugs may help motivated,

abstinent, alcohol-dependent patients when special efforts (e.g. supervised dosing) are made to ensure compliance with taking the medication (Miller *et al.* 2011), but their overall effectiveness has not been demonstrated (Fuller *et al.* 1986).

Another class of medications, including endogenous opioids, operate on specific brain neurotransmitter systems implicated in the control of alcohol consumption. Opioid antagonists, such as naltrexone, have been found in some, but not all, studies to be superior to placebo in delaying the time to relapse and reducing the rate of relapse to heavy drinking among patients (Anton *et al.* 2006; Jonas *et al.* 2014). Acamprosate, an amino acid derivative, has been reported as having significant advantages over placebo, but some large-scale studies have been negative (Anton *et al.* 2006).

Despite advances in the search for a pharmacological intervention that could reduce craving and other precipitants of relapse, the additive effects of pharmacotherapies have been marginal beyond the benefits produced by medical management, standard counselling, and behaviour therapies. These medications tend to have small effect sizes, showing efficacy for only a limited number of individuals with alcohol use disorders (Litten *et al.* 2018). Naltrexone, which can be given once daily, reduces the likelihood of a return to any drinking by 5% and binge drinking risk by 10% (Kranzler and Soyka 2018). Because medications, even in **high-income countries**, are prescribed to less than 9% of patients who are likely to benefit from them (Kranzler and Soyka 2018), they are unlikely to become a substitute for counselling and behaviour therapies in most countries.

13.4.5 Mechanisms of behaviour change: mediators and moderators of treatment effectiveness

Treatment research has produced evidence of near-equivalent reductions in alcohol use, regardless of the type of counselling or therapy, making it unlikely that treatment efficacy is attributable to the ingredients of specific therapies, except for elements common to all forms of therapy (Magill and Longabaugh 2013). The investigation of mechanisms of behaviour change helps to answer questions about how and why treatment works (mediating effects) and for whom certain treatments work best (moderators). This research has taken place within the clinical 'technology model' of treatment efficacy and treatment matching, which postulates that patient attributes and treatment process elements, respectively, constitute mediators and moderators of change in drinking following treatment. Studies show that matching patient attributes to theoretically relevant therapeutic orientations (e.g. matching patients with low motivation to motivational enhancement therapy) does not substantially enhance outcomes, as previously believed (Babor and Del Boca 2003). They also indicate that the mediational mechanisms underlying several of the most popular therapies are different from what is suggested by their proponents. In general, the technology model of treatment effectiveness may be flawed, as it applies to alcohol dependence treatment. Instead of distinct, non-overlapping elements, therapy may work through common mechanisms such as empathy, an effective therapist–client alliance, a desire to change, mobilization of inner resources, a supportive social network, and provision of a culturally appropriate solution to a socially defined problem (Cooney *et al.* 2003).

Spirituality and religiosity, for example, are key components in several types of substance use interventions, including 12-step mutual aid groups. One systematic review of studies in this area (Hai *et al.* 2019) found evidence of effectiveness, but the findings could not be interpreted as proof that spiritual/religious components were the only active ingredients operating. Another study found that Twelve-Step Facilitation (TSF), which is designed to introduce problem drinkers to the principles of AA, was as effective as more theory-based therapies (Babor *et al.* 2003), but mainly because the participant is involved in social networks that support abstinence, rather than its effect on spirituality.

13.4.6 Mandatory and other coercive treatments

There is a degree of coercion in much of the encouragement or pressure from family, friends, or employers that precedes entry to treatment, even for patients who think of the eventual decision to come as their own (DuPont and Humphreys 2011; Room *et al.* 2020). But for much alcohol treatment, coercion is more formal, enforced by official decisions or threats. Opinion is sharply divided on the ethics and effectiveness of such official actions mandating persons with alcohol and other substance use disorders to enter treatment and to maintain abstinence after treatment. According to Vuong *et al.* (2019), mandatory treatment compels someone into treatment either involuntarily where the individual has no choice or say in the matter, or through coercion where there is a choice between a criminal justice sanction and a treatment programme.

There are at least five types of mandatory treatment (Vuong *et al.* 2019): (1) court-mandated treatment; (2) drug courts; (3) compulsory prison-based treatment; (4) civil commitment; and (5) centre-based compulsory rehabilitation (specific to East and South East Asian countries). In addition, some countries have programmes operated by professional groups, such as physicians' and nurses' associations, to treat and monitor members who have been threatened with licence suspension or employment terminations because of alcohol- or drug-related infractions. Physician health programmes, for example, require drug- and alcohol-impaired physicians to complete the programme and submit to frequent random breath testing for periods of up to 5 years to ensure abstinence.

A review of research findings (Vuong *et al.* 2019) on the effectiveness of mandatory treatment schemes indicated the following: (1) there is limited research on the effectiveness of mandatory treatment in the long term (i.e. after the period of treatment programme), but evaluations of short-term effects, particularly from court-mandated programmes and drug courts, show reduced alcohol and drug use and/or dependence; (2) some success has been found in all coerced models, particularly drug courts, in reducing reoffending for substance-related infractions; (3) coerced treatment models were found to be cost-effective in Australia, but involuntary treatment programmes were not; and (4) quasi-military detention and rehabilitation camps that seek to address problematic alcohol and drug use have little supporting evidence and have been heavily criticized for human rights abuses (e.g. Hall *et al.* 2012; World Health Organization 2020).

13.5 Mutual help interventions

Although mutual help societies are not considered a formal treatment for alcohol dependence, they are often used as a substitute or as an adjunct to treatment. With an estimated 2,077,374 members affiliated with more than 125,000 groups in 180 countries (Alcoholics Anonymous 2019), AA is by far the most widely utilized source of help for persons with drinking problems. Parallel organizations with varying ideologies and approaches have been developed in a number of other countries such as Danshukai in Japan, Kreuzbund in Germany, Croix d'Or and Vie Libre in France, Abstainers Clubs in Poland, Family Clubs in Italy, and Links in the Scandinavian countries (Room 1998; Humphreys *et al.* 2004). Several large-scale, well-designed studies (Walsh *et al.* 1991; Ouimette *et al.* 1999) suggest that AA can have an incremental effect when combined with formal treatment, and AA attendance alone may be better than no intervention.

In a Cochrane Collaboration review of 27 studies containing 10,565 participants (Kelly *et al.* 2020), the authors concluded that manualized AA/TSF interventions are more effective than other established treatments, such as CBT, for increasing abstinence. Non-manualized AA/TSF interventions may perform as well as these other established treatments. AA/TSF interventions, both manualized and non-manualized, may be at least as effective as other treatments for other alcohol-related outcomes; those who drop out of AA after the first year, rather than continuing lifelong as urged by AA, may do as well as those who continue in AA (Kaskutas *et al.* 2005). AA may be effective not only because it facilitates adaptive changes in the social networks of participants, but also by teaching recovery coping skills, providing recovery motivation, increasing abstinence self-efficacy, and reducing impulsivity and craving (Kelly 2017). And AA/TSF interventions probably produce substantial health care cost savings among people with alcohol use disorders.

13.6 Cost considerations

A major policy issue with regard to feasibility and extent of brief intervention and specialist treatment is cost. In recent years, there have been significant improvements in the methodological tools used in econometric studies, although economic research in this field is still scarce and not always rigorous (Rehm and Barbosa 2018).

Barbosa *et al.* (2015) analysed the cost-effectiveness of delivering alcohol screening, brief intervention, and referral to treatment (SBIRT) in emergency departments (EDs), when compared to outpatient medical settings, in the United States. Alcohol SBIRT generated cost savings and improved health in both ED and outpatient settings. Limited information is available on the long-term effectiveness of brief alcohol interventions. Two studies followed patients for up to 48 months post-intervention (Fleming *et al.* 2002; Ockene *et al.* 2009) and showed modest short-term effects that faded over time. Other effectiveness studies showed that SBI in outpatient settings is superior to SBI in ED settings, in terms of both drinking outcomes and persistence of those outcomes at follow-ups beyond 6 months (Havard *et al.* 2008). This suggests

that, compared with ED settings, outpatient SBIRT may be more cost-effective in the long term.

Similar research has been conducted to evaluate the costs and benefits of treatment for alcohol dependence conducted primarily in outpatient settings. Rehm and Barbosa (2018) reviewed studies of the cost-effectiveness of behavioural, pharmacological, and combined interventions to treat alcohol use disorders. From the perspective of a health care provider, the costs for interventions were smaller than the savings in services delivery in the years after treatment. Several studies have evaluated the cost-effectiveness of AA attendance and TSF interventions, which were found to have higher health care cost savings than outpatient treatment. In addition, total medical care costs decrease for participants attending AA/TSF treatment, especially among those with the worst prognostic characteristics (Kelly *et al.* 2020).

Regarding cost-effective alternatives for inpatient alcoholism treatment, reviews of this literature (Finney *et al.* 1996; Babor *et al.* 2008) conclude that: (1) inpatient alcoholism programmes lasting from 4 weeks to several months do not have higher success rates than periods of brief hospitalization; (2) some patients can be safely detoxified without pharmacotherapy and in non-hospital-based environments; (3) partial hospitalization programmes ('day hospitalization' with no overnight stays) have results equal or superior to inpatient hospitalization, at one-half to one-third the cost; and (4) in some populations, outpatient programmes produce results comparable to those of inpatient programmes.

13.7 Aggregate effects of treatment and brief interventions

Despite evidence of the effectiveness of brief interventions for hazardous drinkers and treatment for persons with alcohol dependence, little attention has been paid to how these individual-level benefits translate to the population level. Brief interventions and tertiary treatment are primarily designed to serve the needs of individual patients or clients, but there are a number of ways that these interventions may have an impact at community and population levels. The effect of treatment interventions is manifested most directly by reducing the amount of alcohol consumed by the drinker and the associated harms. By removing a source of reciprocal influence that is likely to contribute to the maintenance of heavy drinking subcultures (Skog 1985; Room *et al.* 2016), treatment should diminish the alcohol-related problem rates in a community in ways that go beyond just the recovery of individual drinkers. Treatment and brief intervention services may also contribute to population health by raising public awareness about alcohol problems, setting norms about the benefits of abstinence and low risk guidelines, involving health professionals in advocacy for prevention (see Chapter 14), and providing support to families and employers.

With the growth of SBI programmes and related evaluation research on implementation, a key question is whether the individual-level benefits can result in a population-level effect on alcohol-related morbidity and mortality. This question has been addressed by Heather (2012) who reviewed different empirical and modelling studies of SBI in terms of their potential to have a 'public health benefit', i.e. favourable effects that are detectable in population-level measures such as mortality statistics

or drink-driving injuries. According to Heather's review, the public health potential of SBI is unlikely to be realized without universal screening and widespread implementation of brief interventions, two conditions that rarely exist in communities and nations.

Much of the research on SBI to date has been organized around a narrowly focused clinical care model, rather than taking a broader, complementary public health approach that attempts to maximize its impact on population rates of hazardous and harmful drinking. Despite the growth of universal screening in health care settings to identify and refer drinkers to appropriate levels of care, the population impact of SBI programmes will be limited by the number of individuals who enter such environments. Creative strategies will be needed to implement a universal or near-universal screening programme, and any proposed programmes would need to work synergistically with both primary care and the specialized addiction treatment system. In one scenario (Babor *et al.* 2018), the number of individuals who access SBI services could be increased through social marketing campaigns that widely disseminate hazardous drinking guidelines and other SBI messages, as well as through measures to bring SBI services outside the clinic and into the community using digital technologies.

Beyond SBI, a related question is whether specialized treatment services in most countries have an impact on morbidity and mortality at the level of communities and nation states. As noted in other parts of this chapter, few countries have the capacity to provide alcohol treatment services to the majority of those in need. Nevertheless, there is some evidence that treatment has the potential to produce aggregate impact in countries where the treatment system is relatively well developed (Smart and Mann 2000). Several researchers have identified associations between declining liver cirrhosis rates and the growth of specialized treatment. Mann *et al.* (1988) found that decreased hospital discharge rates for liver cirrhosis were associated with increased treatment in Ontario, Canada. Romelsjö (1987) suggested that in addition to decreased per capita consumption, outpatient treatment may have accounted for the reduction in liver cirrhosis rates in Stockholm, Sweden. Holder and Parker (1992) found that increased alcohol treatment admissions (both in- and outpatient) over a 20-year period in North Carolina were related to a significant reduction in cirrhosis mortality rates.

Despite these findings, there is a dearth of research on the overall impact of brief intervention and traditional treatment services on population health or welfare indicators, and there has been little research on whether different system designs are more efficient or effective than others. One approach that has helped to address this need is the use of statistical modelling to estimate the impact of treatment interventions on alcohol-related mortality and morbidity. Box 13.1 describes the results of several modelling studies, suggesting that treatment and SBI services can make a substantial difference in population rates under the right conditions.

Other research has attempted to evaluate the effects of different organizational models and treatment system qualities. A comparison of the national alcohol treatment systems in Denmark and Sweden (Pedersen *et al.* 2004) showed that certain internal characteristics of the treatment system (i.e. accessibility, relation to drug treatment, treatment for special groups, and structured treatment) were important for getting patients into treatment (catchment), while certain external factors were

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Box 13.1 Can treatment services make a difference in morbidity and mortality at the population level (using statistical models to answer a key question)?

Using data from the 27 nations of the European Union, Rehm *et al.* (2013) modelled the impact of alcohol dependence on mortality burden, which was estimated to be one in seven deaths in men, and one in 13 in women. Based on treatment effectiveness data derived from the brief intervention and alcohol treatment literature for both non-pharmacological and pharmacological therapies, it was found that by increasing treatment coverage to 40% of people with alcohol dependence (from the current level of 10%), alcohol-attributable mortality could be reduced by 13% in men and by 9% in women. Although the potential benefits of increased treatment availability are comparable to those documented in research on population level measures, such as increased alcohol taxes and availability controls (see Chapters 8 and 9), the authors caution that these projections are subject to the limitations of statistical modelling, as well as costs and feasibility, and should be used to complement, rather than replace, more evidence-based approaches.

In another modelling analysis, Brennan and colleagues (2019) estimated the impact of increasing access to specialist treatment pathways in a municipality in the United Kingdom on future alcohol dependence, treatment outcomes, costs, and mortality. In one scenario, increasing access rates to the same level as that in neighbouring Scotland was estimated to reduce the future prevalence of alcohol dependence by 19.2%.

In addition to modelling the effects of formal treatment services, other attempts have been made to estimate the public health benefit of SBI. Chisholm *et al.* (2004) conducted a comparative cost-effectiveness analysis to estimate the population impact of five evidence-based interventions, including SBI. In regions with high rates of hazardous drinking, both physician advice (e.g. SBI) and population-wide measures, such as alcohol taxes, were estimated to have a favourable impact on population health. In regions with low rates, strategies such as brief advice targeted at particular heavy-drinking subgroups were thought to be more cost-effective than population-wide measures. Another approach, called the Sheffield Alcohol Policy Model (Brennan *et al.* 2015), estimated the effects of a hypothetical 10-year national screening programme in the United Kingdom. Although an emergency department scenario produced disappointing results, models utilizing general practitioner doctors were found to be cost-effective.

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relevant for the rate of treatment (i.e. a referral guarantee and a general appreciation in the surrounding systems of the nature of alcohol treatment). In a study of almost 1900 clients and patients in different parts of the substance abuse treatment system in Stockholm county, Stenius *et al.* (2005) found that in contrast to an organizational model where residential treatment predominated, a system organized around outpatient services was better at recruiting members of vulnerable groups into treatment, which could translate into population health benefits.

13.8 Conclusion: building more effective treatment systems

In the twenty-first century, there has been a growing awareness of the need for re-search on the ways in which treatment systems for alcohol problems are conceptu-alized and organized. There has been increased recognition that there are health and social problems from drinking not only for the drinker, but also for family members and others around the drinker (Selbekk *et al.* 2018) (see also Chapter 4), whereas serv-ices to deal with the problems are often financed only for treatment of the drinker. Discussion of treatment at a system level has often been limited to focusing on the health system, when other societal response systems—welfare, justice, and public housing, for instance—are highly relevant as well. Policy discourse on treatment sys-tems is often dominated by a national focus (Klingemann 2020). Despite some ini-tial comparative studies of national treatment systems (e.g. Klingemann *et al.* 1992; Storbjörk 2010), little research has evaluated their population-level impact and the system characteristics associated with it. An inquiry across ten European countries found a rather slow diffusion of innovations, a questionable trend toward 'new public management' methods, some regression to more moralized approaches, and con-tinuing treatment gaps for less favoured populations (Klingemann 2020).

A set of international standards for treatment of 'drug use disorders', developed jointly by the WHO and the United Nations Office of Drugs and Crime (UNODC) (2020), provides a framework for building specialized treatment systems for all psy-choactive substance use disorders. According to the standards, an effective national system requires a coordinated and integrated response by many actors. The aim is to deliver services and interventions in multiple settings targeting different groups at dif-ferent stages of the substance use disorder. The public health system, and not neces-sarily the psychiatric arm of the medical care services, working in close coordination with social care and other community services, is considered to be in the best position to deliver effective treatment services. In some countries, the private sector and non-governmental organizations can play an important role, although substantial govern-ment funding will be needed.

Most treatment interventions are needed at lower intensity levels and the services need to reach beyond the health sector. Low-intensity interventions in community or non-specialized settings (such as SBIs) can prevent people from developing more se-vere disorders. Outpatient treatment is the recommended first choice of setting from a public health perspective, as long as it is evidence-based and can meet the patient's needs. Inpatient and residential treatment may be required, based on an individu-alized assessment for those with more severe or complex substance use disorders or additional social problems (World Health Organization and United Nations Office on Drugs and Crime 2020, pp. 16–17). According to the WHO and the UNODC (2020) standards, treatment services should be available, accessible, affordable, evidence-based, and diversified enough to meet the needs of different subpopulations such as adolescents, multiple substance users, those with co-occurring psychiatric disorders, pregnant women, and the elderly.

Ultimately, policymakers and the general public want to know two things about alcohol treatment services: (1) Does treatment work well enough to alter the course of an excessive drinker's harmful drinking behaviour?; and (2) Can the totality of social and clinical services reduce the human and financial costs to society, especially in terms of alcohol-related disease, crime, violence, traffic fatalities, and other problems?

To answer the first question, Table 13.1 provides the authors' consensus ratings of the interventions considered in this chapter. As described in ⊜ Online Appendix 1, the strategies and interventions are rated by the authors in two major areas: (1) evidence of effectiveness; and (2) amount of research support.

The effectiveness ratings indicate that the first question can be answered affirmatively, based on the research findings from 50 years of clinical research showing most treatment services for persons with harmful drinking patterns contribute to short-term abstinence or reduction in drinking and, to a lesser extent, long-term recovery. Both pharmacological and non-pharmacological treatment interventions are effective and they are considered to be moderately cost-effective, particularly when delivered in outpatient settings. Programmes operated by mutual help organizations such as Alcoholics Anonymous are rated high in terms of effectiveness, population reach, and low cost. In addition, brief interventions for non-dependent hazardous drinkers, along with referral to treatment for more serious cases, have strong research support, but implementation of these programmes remains challenging in most countries (Heather 2012).

The second question speaks to the issue of treatment systems and whether the development of a continuum of services can have a significant impact on the prevalence of alcohol-related problems in society. Progress has been made in a variety of areas related to the treatment system and its services. This includes studies of the impact of service coordination on costs and outcomes (Pedersen *et al.* 2004), needs-based planning (Ritter *et al.* 2019; Rush and Urbanoski 2019); and measurement of service system components and performance (Hirschovits-Gerz *et al.* 2019; Mota *et al.* 2019; Tremblay *et al.* 2019). Nevertheless, the overall impact of treatment services on morbidity and mortality has not been studied sufficiently to answer this question, although modelling studies suggest the potential for a modest impact (see Box 13.1).

The relative dearth of treatment research at the systems level suggests the need for a public health model of the structural resources and qualities of alcohol treatment systems that might explain how a collection of services could work synergistically to improve population health. Figure 13.1 presents such a heuristic model, which begins with the policy determinants of treatment services and ends with the population impact of treatment systems. Treatment policies, such as funding decisions, affect the number of services, as well as system qualities, specifying not only where services are located, but also how they are organized and integrated. System qualities include equity (the extent to which services are equally available and accessible to all population groups), efficiency (the most appropriate mix of services), and economy (the most cost-effective services). These qualities can be considered as mediators of system effectiveness, to the extent that they transmit the effects of system structures and programmes. In this conceptual model, it is postulated that structural resources and system qualities contribute significantly to the effectiveness of services (Babor 20015).

Table 13.1 Consensus ratings of treatment and early intervention services[c]

Strategy or intervention	Effectiveness[a]	Breadth of research support[b]	Comments
Brief interventions designed for non-dependent high-risk drinkers	++	+++	Can be effective, but most primary care practitioners lack training and time (and often motivation) to conduct screening and brief interventions. Moderate cost to implement and sustain; low to moderate population reach
Medical and social detoxification for persons with alcohol dependence	++	++	Safe and effective (can be lifesaving) for treating withdrawal syndrome but has little effect on long-term alcohol consumption, unless combined with other therapies; high cost to implement and sustain
Behavioural and psychosocial modalities	+/++	+++	Considerable amounts of research indicate effectiveness in reducing alcohol consumption and harms, but relapse is typical for a significant proportion of the treated population. Standardization of therapeutic techniques through therapist training may account for effects in research studies, compared with community settings where most therapy is non-standardized
Contingency management	++	++	Highly effective in promoting treatment attendance and reducing relapse to alcohol use. Little research in low- and middle-income countries, and programmes difficult to implement in high-income countries
Pharmacological treatment	+/++	++	Effective in reducing alcohol consumption and harms, but relapse is typical for a significant proportion of the treated population. The additive effects of pharmacotherapies, when combined with psychosocial therapies, have been marginal
Mandatory and coercive treatment	+/?	++	Much of the treatment of alcohol dependence has an element of coercion in it, but this rating refers to studies of highly coercive programmes; cost to implement and sustain is likely to be high
Mutual help interventions	++	++	A feasible, cost-effective complement or alternative to formal treatment in many countries; relapse rates found to be high, with multiple exposures to support groups necessary; low cost to implement and sustain

[a] 0 Evidence indicates a lack of effect, i.e. the intervention was evaluated and found to be ineffective in reducing alcohol consumption or alcohol problems; + Evidence for a small or limited effect on consumption or problems; ++ Evidence for a moderate effect on consumption or problems; +++ Evidence of a strong effect on consumption or problems; ? One or more studies have been undertaken, but there is insufficient evidence upon which to make a judgement.

[b] 0 No studies of effectiveness have been undertaken; + One or two well-designed effectiveness studies completed; ++ More than two effectiveness studies have been completed, but no integrative reviews available or none that include low- and middle-income countries; +++ Enough studies of effectiveness have been completed to permit integrative literature reviews or meta-analyses, with some testing in low- and middle-income countries.

[c] For further information, please see ⊜ Online Appendix 1
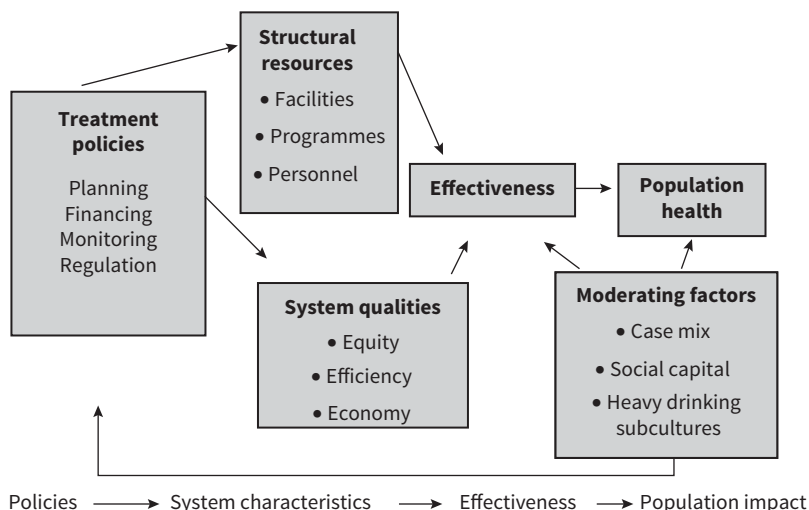
Figure 13.1 Conceptual model of population impact of alcohol treatment systems.

Adapted wih permisison from Babor TF, Stenius K, and Romelsjo A (2008) Alcohol and drug treatment systems in public health perspective: mediators and moderators of population effects. *International Journal of Methods in Psychiatric Research*, 17(S1), S50–S59.

As suggested in Figure 13.1, the cumulative impact of these services should translate into population health benefits, such as reduced mortality and morbidity, as well as reductions in unemployment, disability, crime, suicide, and health care costs. The model also provides for the possibility that both effectiveness and population impact of treatment systems are influenced by certain moderating factors, such as the socio-demographic characteristics of the population with alcohol use disorders (i.e. 'case mix'), the social capital possessed by (or lacking in) these population groups (e.g. civic participation and community integration), and the cultural factors that determine patterns of substance use, as well as societal reactions to it. These moderating factors can contribute to the outcome of treatment, regardless of system qualities and types of treatment, and should be taken into account in the design and evaluation of any treatment system. For this reason, we have included a feedback loop from the moderating factors to the treatment policy box to emphasize that for optimal performance, treatment systems need to be designed to fit the characteristics of the population and its treatment needs.

Despite significant progress in the evaluation of treatment effectiveness, the history of alcohol treatment services provides several cautionary lessons for government officials and others interested in policies that support treatment programmes. One lesson is that alcohol treatment services tend to evolve more in response to tradition and to rapidly increasing problem rates, rather than in response to rational planning. Another lesson has been that services decline in times of economic downturn, in part because the stigma of addiction does not help with the recruitment of powerful allies to sustain funding. We have also learnt that services evolve in response to changing patterns of substance use, teaching us that static models of treatment planning need

to be replaced with more dynamic ways to meet ever-changing trends in technology, research, culture, and demographics.

Based on the evidence reviewed in this chapter, the way forward seems clear—treatment services are primarily aimed at responding to problems after they exist. They can contribute to the mix of strategies needed to reduce alcohol problems, but they do not obviate the need for universal strategies that can have a greater impact at the population level at much lower cost.

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14

The policy process: multiple stakeholders and multiple agendas

14.1 Introduction: the major stakeholders

This book is concerned with alcohol policy, viewed from a public health perspective, focusing on the prevention of alcohol-related problems. While there is now a growing scientific basis to support the effectiveness of numerous alcohol policy initiatives, there is much less understanding of the way in which governments, interest groups, and communities operate within the policy arena to apply this information in the interests of public health. In this chapter, we consider the following questions. Who are the major players in the alcohol policy area? How does each player contribute to the policymaking process? What is their individual and collective impact on public health? The answers to these questions are not simple, differing among countries and between levels of government within countries. We adopt a political economy perspective on how agendas are set in the policymaking process (Zahariadis 2016), taking into account the major interests that are often involved in democratic societies in policy formation, implementation, and enforcement in the area of alcohol control. The extent to which any participant in this process can influence alcohol policy depends on their political power, the conceptual framework under which they operate, and the tactics employed to implement political strategies.

Table 14.1 provides an overview of the stakeholders involved in the formulation, implementation, and enforcement of alcohol policy, including government legislative bodies and agencies, health professionals, non-governmental organizations (NGOs), the scientific community, the mass media, and commercial interests linked to the alcoholic beverage industry. In addition to groups and organizations working in the interest of public health and welfare, commercial interests are also involved. There are also other actors, including government departments such as the Ministry of Finance, which may be seeking to increase alcohol production and sales in the interests of revenue generation or economic or agricultural development, agendas that often conflict with public health interest in reducing alcohol-related harms.

14.2 Governmental policymakers and agencies

Alcohol policies are developed, implemented, and enforced at different levels of government. The alcohol-specific legislative framework is often established at the national

Table 14.1 Stakeholders, conceptual frames, major agendas, and strategies and tactics involved in formulation, implementation, and enforcement of alcohol policy

Stakeholders	Examples	Conceptual frame	Major agendas	Strategies and tactics
Government agencies	Ministries of finance, public health, and criminal justice	Economic development, public health or social control	Tax revenues, economic development, public health, drink-driving, crime, punishment and deterrence	Laws, regulations, enforcement, treatment, prevention services, public information, training
Commercial interests	Major producers, trade groups, SAPROs, advertisers, retailers, hospitality industry	Free market capitalism	Sales and profits, free trade, self-regulation	Lobbying, litigation, corporate social responsibility activities, reputation management, avoidance of regulation and taxation
Public interest groups	Treatment providers, non-governmental organizations, professional societies and groups	Problem prevention and minimization, social welfare, sustainable development	Treatment and prevention services, alcohol control policies	Information dissemination, policy advocacy, social movements
Scientific community	Addiction scientists, epidemiologists	Pursuit and sharing of scientific knowledge	Research funding, translation of research into practice and policy	Scientific research, policy analysis, academic publications
Mass media and social media	Facebook, YouTube, television, radio, newspapers, magazines, government-controlled media	Mixed, depending on governmental or private ownership	Advertising revenues, freedom of speech, self-regulation	News, commentaries, debate

level, although in federal countries, much of the law-making and governance may be at the state or provincial level. Areas commonly covered in alcohol-specific laws include: control over the production, export, and import of commercial alcohol products; control of wholesaling and retailing; legal minimum purchase ages for alcoholic beverages; prohibitions on drinking in particular places or with particular activities (such as laws against drink-driving); alcohol marketing restrictions; and support of treatment and prevention services. In addition, at one or more levels of government, there are usually special taxes on alcoholic beverages (World Health Organization 2018, pp. 95–112) (see Chapter 7). Beyond these alcohol-specific laws, alcoholic beverages will also be subject to general legislation and regulations, for instance on purity and labelling of foodstuffs, under the jurisdiction of various government departments.

As described in Chapter 15, there are no binding laws controlling alcohol in the public health interest at the international level. However, commercial and fiscal interests have increasingly used the international processes of trade and investment agreements to limit the power of national governments to control their domestic alcohol market. This suggests the need for coordinated international alcohol policy to counteract these interests.

Apart from laws at the national and state/provincial levels, production, sale, and consumption of alcohol are also regulated at local levels. Harms from drinking are most immediately visible within neighbourhoods and communities; therefore, responding to alcohol-related problems is often a priority at that level (Reynolds *et al.* 2020), although commercial and fiscal interests can also use provincial or national laws to limit local action.

In many democratic societies, opportunities to influence the legal framework of alcohol polices are part of the legislative process in which interested parties can participate. The formal political process may include sector consultations, policy reviews, and investigations by commissions. Draft legislation offers opportunities for various stakeholders to provide comments, meet with legislative committees, and make contact with representatives who will vote on the law or regulation. Interested individuals, professional groups, trade unions, NGOs, and industry representatives all participate in this way. However, while all stakeholders may be formally equal, some participants, such as the alcohol industry, may have an advantage because they have more resources to devote to the process than do other participants. This is also the case for the many informal ways of participating in the policy process where alcohol policy outcomes and their day-to-day implementation can be influenced by ongoing lobbying of politicians and regulatory authorities, through participation in administrative and advisory boards and by both public opinion and the political climate through the mass media (Casswell 1995). There has also been a long history in many jurisdictions of financial support by alcohol industry interests for politicians and political parties to encourage a sympathetic position toward industry-favoured policies (Marin Institute 2008; Robaina *et al.* 2020).

Within government, many different decision-making authorities (e.g. health ministry, transportation authority, taxation agency) are involved in the formulation, implementation, and enforcement of alcohol policy, and differing core responsibilities of departments may lead to conflicting agendas. On the one hand, the government has interests in promoting the industry and the economy, and in collecting revenue to

finance the state, interests that are likely to benefit from *greater* alcohol sales and consumption. On the other hand, the government also has interests and responsibilities in promoting public order and security, labour productivity, and public health, all of which are likely to benefit from lower alcohol consumption (Mäkelä and Viikari 1977). Which department has jurisdiction over a government function may affect how it acts with respect to these conflicting agendas. A government retail **alcohol monopoly**,[1] for instance, is both a source of government revenue and a potential means of alcohol control in the public health interest; therefore, whether the monopoly is placed under a finance department or a health or welfare department is likely to influence which of the competing agendas prevails (Room and Cisneros Örnberg 2019).

The agenda of each department is governed by legislation and is influenced by central government decisions, but on a day-to-day basis, this agenda is in the hands of its leading civil servants, who are often longer-term players, compared with elected representatives. There are thus many avenues through which interest groups or civil society organizations can influence the agenda of the department, not only through formal hearings and submissions, but also through informal connections, inducements, and contacts.

Having a national policy to reduce the harmful use of alcohol is the first of ten target areas for government action specified by the World Health Organization (2010, p. 11). But having a written national policy does not necessarily mean that public health interests have set a national agenda. For example, it turns out that the almost-identical national alcohol policies proposed in four African countries in the 2000s were written by the same external consultant paid by alcohol industry interests (Bakke and Endal 2010) who would benefit from policies with the least amount of restrictions. Even without direct involvement of alcohol industry influence, there may be a 'lowest common denominator' effect that moves a national policy document in the direction of minimal restrictions that can be endorsed by everyone, to the exclusion of legislative controls embodying the best practices; thus, national policies are often very weak and typically focus on solutions that rely on individual responsibility, rather than on universal strategies at the population level (see Chapters 7, 8, and 9).

14.3 Commercial interests

There are significant commercial interests involved in the manufacture, marketing, distribution, pricing, and sale of alcoholic beverages. Although the alcohol industry is not monolithic in terms of its motives, power, or operations, in many instances, the industry's commercial imperative to make a profit competes with public health objectives. For example, the elimination of restrictions on hours of sale, often favoured by industry interests, can lead to an increase in alcohol consumption and related problems (see Chapter 8). Media advertising and other marketing are considered by health advocates to pose particular risk for vulnerable populations such as adolescents (see

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

Chapter 9), but government regulations on advertising are consistently opposed by the alcohol industry in favour of a self-regulation approach.

With its commercial interests at stake, it is not surprising that the alcohol industry should be actively involved in the policy arena. Even where the industry is not the dominant non-governmental presence at the policymaking table, its representatives are usually influential in setting the policy agenda, shaping the perspectives of legislators on policy issues, and determining the outcome of policy debates (e.g. McCambridge *et al.* 2018). Its influence strategies and tactics have been well documented (Savell et al. 2015; Robaina *et al.* 2020), including: (1) gaining access to political decision-makers; (2) targeting political decision-makers indirectly through constituent support; (3) promoting alternative policy or voluntary measures; (4) providing financial incentives to influence government policy-makers to act in a certain way; and (5) litigating to neutralize an unwelcome measure, or otherwise circumventing it.

Gaining access to government decision-makers in order to control information flow may be a company's single most important political goal (Hillman *et al.* 1999; Schuler *et al.* 2002). Tactics to control this flow include: partnerships with government agencies and civil society organizations; activities to shape scientific evidence and to frame media discourse; and political lobbying. Informal partnerships with the government can be achieved, for example, by appointing former high-level cabinet members and elected officials to the boards of alcoholic beverage companies where they can use their contacts with government officials to influence legislation and regulation. Building long-term relationships with politicians and officials is an essential strategy because policymakers often rely on trusted information sources in a complex and information-overloaded environment (Cairney 2019).

Shaping the evidence base through sponsored research, selective research dissemination, and discrediting of public health research are other tactics used by the industry. Selective support for research likely to favour the industry's interests and access to government decision-makers were both evident in the alcohol industry's involvement in a large, but eventually aborted, international study of moderate drinking and cardiovascular disease under the auspices of the US National Institutes of Health (Mitchell *et al.* 2020).

Another vehicle to mobilize political influence is through trade associations, which represent the interests of wine, spirits, and beer producers to the media, the public, and the government. Alcohol industry corporations also find allies in other industries who profit from the sale of alcohol (e.g. restaurants and bars, grocers and other retailers, hotels, and media, marketing, sporting, and cultural bodies). Sporting organizations in many countries have close relationships with alcohol and media industries. For example, the international soccer federation FIFA ensured the temporary removal of alcohol control legislation as part of its sponsorship deal for the World Cup in Brazil in 2014; this opened the gate for ongoing increases of alcohol availability at Brazilian sports events that endured long after the World Cup (de Almeida and Marchi Júnior 2020).

Policy substitution is one tactic used by the industry to prevent the implementation of regulations. These substitutions include the promotion of voluntary actions by industry members, particularly self-regulation, instead of effective policies. The industry actively lobbies to develop new (or preserve existing) self-regulation in the form of—ineffective voluntary codes of marketing practices (Noel

et al. 2017) and labelling innovations written by industry-supported organizations—in place of formal legislation.

Donations and campaign contributions to politicians are another way through which the alcohol industry maintains strong connections to local and state governments. According to Transparência Brasil (2016, p. 11), a non-governmental anti-corruption organization, Brazil's largest alcohol producer, Ambev, spent approximately 10 million USD on political donations and lobbying in 2014, which was 3.7 times more than the company spent in 2010. In several instances, large producers have been fined because of illegal contributions to government officials (see Box 14.1). When governments propose new regulations, the industry has threatened or instituted legal action against alcohol policies or policy research (see Box 14.2). Being a signatory to trade and investment agreements also affects governments' willingness to adopt alcohol policies; even in the absence of legal action, there can be a chilling effect (see Chapter 15).

Another way that the large producers advance their policy interests is through philanthropic giving and **corporate social responsibility** (CSR) activities. The alcohol industry and its **social aspects and public relations organizations** (SAPROs) engage in a variety of educational activities, support server training programmes, and conduct designated driver campaigns (Esser *et al.* 2016; Babor *et al.* 2018), typically promoting a set of key messages, such as drinker responsibility, that echo industry interests (Anderson 2004). They also support harm reduction policies, typically those that will

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Box 14.1 Big alcohol: good corporate citizen or illicit foreign intruder?

On 27 July 2011, the United States Securities and Exchange Commission (SEC) issued a cease and desist order to Diageo plc, one of the world's largest alcohol producers, as well as a civil penalty of $3,000,000. According to a summary of the proceedings:

> This matter concerns multiple violations of the Foreign Corrupt Practices Act ('FCPA') by Respondent Diageo, one of the world's largest producers of premium alcoholic beverages. Over more than six years, Diageo, through its subsidiaries, paid over $2.7 million to various government officials in India, Thailand, and South Korea in separate efforts to obtain lucrative sales and tax benefits … Diageo and its subsidiaries failed to account accurately for these illicit payments in their books and records. Exercising lax oversight, Diageo also failed to devise and maintain internal accounting controls sufficient to detect and prevent the payments.

A decade later, Diageo agreed to pay a $5 million civil fine to settle SEC charges that the company's North America division pressured distributors to buy excess inventory to boost its results in a flagging market.

Sources: data from Murphy EM (2011) Order instituting cease-and desist proceedings pursuant to Section 21c of the Securities Exchange Act of 1934, making findings, and imposing a cease-and-desist order and a civil penalty. Securities and Exchange Commission (https://www.sec.gov/litigation/admin/2011/34-64978.pdf); and Stempel J (2020) Diageo to pay $5 mln to settle SEC charges it concealed liquor overshipments. Reuters, 19 February (https://www.reuters.com/article/us-diageo-sec-idUSKBN20D27Z).

Box 14.2 Threat of legal action against policy research

In 2017, alcohol scientists at Public Health Ontario and the Canadian Institute for Substance Use Research at the University of Victoria conducted a ground-breaking study (Zhao *et al.* 2020) of alcohol warning labels in Yukon, Canada. The labels included: (1) a cancer warning; (2) low-risk drinking guidelines; and (3) standard drink messages. Compared with neighbouring regions (which served as control sites), per capita sales of labelled products declined in the intervention community by 6.6%. This study showed that enhanced alcohol labels are noticed and may be an effective strategy for reducing heavy drinking (Schoueri-Mychasiw *et al.* 2020).

During the study, alcohol industry lobbyists pressured the Yukon government to temporarily shut down the research, using the threat of litigation to remove the cancer warning from the ongoing investigation. Despite the interference, the study was completed in modified form. Ironically, by drawing media attention to its own lobbying activities, the industry may have inadvertently increased public support for alcohol policies and helped to further broadcast the message that alcohol is a cause of cancer (Stockwell *et al.* 2020).

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have the least impact on total sales (McCambridge *et al.* 2018). Thus, the International Alliance for Responsible Drinking (IARD), a public relations organization supported by the largest global alcohol producers, distributes publications that emphasize alcohol education, 'responsible drinking' campaigns, industry self-regulation of marketing, and training of alcohol retailers and servers as favoured measures to prevent alcohol-related problems. However, as described in Chapters 9, 10, and 12 of this book, these are among the least effective measures to reduce alcohol-related harms, compared to other strategies such as taxation and limiting access, which could be financially disadvantageous for the alcohol industry.

Through such initiatives, the industry perspective is present in policy debates of many of the major producer and consumer nations, including the emerging markets (Casswell and Thamarangsi 2009). For example, a wide range of industry-friendly organizations influenced the policy debate in Vietnam in 2018–2019, with the final legislation excluding many of the evidence-based policies initially proposed (Casswell 2020).

14.4 Public interest groups and social movements

In the modern era, a number of public interest groups operate at the local, national, and international levels to address alcohol's role in social and health problems from different philosophical approaches. One such group was the Women's Christian Temperance Union, which operated in the late nineteenth and early twentieth centuries in some countries (Tyrrell 1991). NGOs in the temperance tradition still contribute to the policy process in some areas of the world, for instance, FORUT, a Norwegian international development and aid organization (https://forut.no/english/) and Movendi International (formerly IOGT; https://movendi.ngo/about-movendi/),

an international NGO with a particular focus on low- and middle-income countries (LMICs).

Because alcohol is recognized as one of four major **non-communicable disease** (NCD) risk factors, the international focus on NCDs has increased the involvement of international NGOs, including the NCD Alliance (https://ncdalliance.org/) and Vital Strategies, which promote public health in LMICs (https://www.vitalstrategies.org/about-us/).

In recent decades, there have also been interest groups representing those adversely affected by others' drinking in diverse parts of the world. Often these have been women's movements against the problems posed by men's drinking, for instance in India (Gururaj *et al.* 2021) and the Pacific islands (Marshall and Marshall 1990) and among Australian Aboriginal women (Wright 2009; Brady 2019). The Mothers Against Drunk Driving (MADD) movement in the United States, which came to involve more than mothers, was a major element in the successful advocacy for raising the US minimum drinking age to 21 (DeJong and Russell 1995). The role of public opinion, irrespective of particular movements or interest groups, can also be influential (Pertschuk 2010).

As the temperance movements in many societies declined in the mid-twentieth century, alcohol-related problems have been increasingly taken up by public health institutions and NGOs (Room 1984). Since the 1980s, national public health associations in a number of countries and global organizations have added alcohol issues to their agendas for advocacy. The American Public Health Association and the World Medical Association, for example, both have policies in favour of a Framework Convention on Alcohol Control. The Global Alcohol Policy Alliance (GAPA) (https://globalgapa.org/) is an international advocacy organization with the mission to promote evidence-based policy free from commercial interests. It has a primary focus on global policy, including the promotion of a Framework Convention on Alcohol Control.

Medical professionals and their affiliated groups have also been instrumental in putting alcohol issues on the public agenda. The public health policy developments in France in the 1980s, for example, were initiated by the efforts of a group of medical specialists—'the five sages' (Craplet 1997). Professionals concerned with law and order have also played a role in the policymaking process in some countries (Baggott 1986). A police surgeon in Victoria, Australia, played a leading role in the pathbreaking adoption of random breath testing (RBT), the most effective preventive measure against drink-driving casualties (Garrard 2004).

Harms from alcohol are often most visible at the level of the neighbourhood or locality. Injuries and deaths from crashes involving alcohol-impaired drivers are dealt with by community police, hospitals, and emergency medical services. Alcohol problems are sometimes very salient personal experiences for community members who are motivated to take local action, often protesting against the number of outlets selling alcohol products in their community. Such groups can also create public pressure against retail alcohol sales to underaged persons and against access to alcohol at youth social events.

Similarly, alcohol issues often become part of the policy agenda when well-publicized alcohol-related harms occur (e.g. injuries or deaths at a bar or

nightclub) or when first responders to health, injury, or assault emergencies (e.g. ambulance workers, police, emergency physicians) give testimony at public hearings or inquiries, highlighting the damaging effects of alcohol (Conigrave 2016). Their testimony may be backed up with evidence from institutional records, but often their descriptions of particular cases and events are seen as the most persuasive evidence.

While it is relatively easy to introduce educational or informational campaigns locally, challenges from commercial and other vested interests may be quick to emerge against the implementation of policies that are directed at law enforcement, drinking environments, access to alcohol, and regulation changes. As noted in Section 14.3, citizen groups that support efforts to implement special policies need to be prepared for opposition or for the agenda being diverted by the alcohol industry to initiatives that have a high profile, but little or no impact on alcohol-related problems (e.g. providing free coffee to drivers on New Year's Eve).

Advocacy coalitions built at the local level have often included scientific researchers alongside public officials, the police, health sector representatives, and local NGOs. In Norway, such a coalition promoting the beneficial effects of restricting trading hours was counteracted by a coalition of conservative politicians and hospitality industry representatives emphasizing individual freedom, economic impacts, and other industry interests (Rossow *et al.* 2015). These opposing vectors of competing interests are common in local and national policy arenas.

One approach that started in New Zealand in the 1980s was to translate evidence-based strategies into local alcohol policies through multi-component community action projects to reduce alcohol-related harm (Hill and Stewart 1996; Stewart *et al.* 1997). Key elements of one such model developed in New Zealand are summarized in Box 14.3. As described in Chapter 12, evaluated community action projects have also been implemented in the United States, Australia, Canada, and several Nordic countries (Midford and Shakeshaft 2017; Room 2017).

While there have been notable successes from particular projects (e.g. the STAD project in Stockholm, Sweden) (Wallin *et al.* 2003, 2005), these successes have not been easily replicated in other communities (Hallgren and Andréasson 2013; Quigg *et al.* 2019). A common issue is that communities usually have limited power to change important determinants of alcohol problems such as the extent of alcohol's availability (Room 2017).

The findings from a study of successful community-initiated movements on alcohol control issues in inner-city communities in the United States suggest that a crucial ingredient for successful community action is passion and a sense of grievance (Herd and Berman 2015). Where evaluated community action projects have been initiated from outside the community and funded from a research budget by another level of government, this may have diminished the space for authentic community involvement. However, where research was not the overwhelming concern but was still an important and negotiated component, a partnership between researchers and an indigenous population was judged successful (Moewaka Barnes 2000). Given the lack of resources inherent in disadvantaged communities, support from both community input and outside resources may be necessary to achieve lasting change.

Box 14.3 Key elements of the research-informed Community Action Model in New Zealand

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- Realistic objectives and time frames negotiated and reviewed regularly with all stakeholders, including funders
- Community readiness to be engaged in community action or sufficient time allowed for initial development work to build community capacity, including infrastructure to support the project
- Development of a partnership between community organizations and evaluators
- Designated community organizers working from a supportive local community organization
- Strategies developed and delivered by the most appropriate ethnic group to ensure cultural knowledge for better reach, engagement, and uptake
- Research data, other evidence, critical feedback, and local knowledge brought together to develop project strategies and activities that are responsive to the political, social, and economic context
- Focus on specific environmental strategies for structural change
- Intersectoral collaboration with key stakeholders
- Use of local media to raise community awareness
- Supportive national-level mass media debate, social marketing strategies, and policy framework

Source: data from Conway K and Casswell S (2003) Riding the waves: The politics and funding context of twenty-five years of research on community action to reduce alcohol harm in New Zealand. *Nordic Studies on Alcohol and Drugs* 20:(suppl. 1): 13–24.

14.5 The scientific community

Policy debate increasingly relies on research findings to bolster a point of view. However, there is no simple relation between scientific findings and policymaking. Bruun's (1973) conclusion that research 'produces arguments rather than logical conclusions regarding policy and action' remains valid. Nevertheless, there has been exponential growth in scientific research relevant to alcohol policy, with concomitant increases in articles published and scientists working in the field (Babor *et al.* 2017), although the increase is unevenly spread, even among **high-income countries** (Savic and Room 2014).

Researchers often provide the raw material for policy decisions via monitoring and surveillance. The Global Burden of Disease project, for example, has had a major impact on how alcohol is viewed as a contributor to mortality and disability (see Chapter 4). Researchers also play an important role by evaluating the effectiveness of particular programmes or policies. One of the clearest examples of this was the debate over RBT legislation in New South Wales, Australia (Homel 1993). Research findings supporting the effectiveness of RBT were disseminated widely in the context of

high public concern over drink-driving statistics. Research played a key role in legislation that raised the minimum alcohol purchasing age to 21 in the United States (Wagenaar 1993). In Thailand, research was one of three elements in the development of alcohol control policy, along with policy advocacy and social mobilization (Thamarangsi 2009).

The need to maintain an independent scientific community capable of contributing to the policy process has been threatened by increasing involvement of commercial interests in scientific research on alcohol (Babor and Robaina 2013). While industry involvement in research activities is increasing, it presently constitutes a rather small direct investment. The industry's dissemination and disinformation activities can, however, confuse public discussion of health issues and policy options, and provide the industry with a convenient way to demonstrate 'corporate social responsibility' in its attempts to avoid taxation and regulation (Tesler and Malone 2008). For these reasons, alcohol scientists have become increasingly sceptical about accepting industry funding for their research (Casswell 2009; Miller *et al.* 2009).

Additional challenges to evidence-based policy derive from the tendency of policymakers to 'cherry pick' the evidence. There are numerous examples where policymakers select pieces of evidence or interpretations that fit well with their own agendas and may not accurately reflect the full picture (Rossow *et al.* 2015; Rossow and McCambridge 2019). This calls for awareness and critical assessment of all scientific claims in the policymaking process.

What is needed in any society where there is substantial use of alcohol is a long-term publicly funded research programme designed to engage members of the scientific community in the collection, evaluation, and interpretation of research data that are relevant to the country's alcohol policy needs. Public funding supports the accountability of researchers to report what they find, even when the findings go against established policies. Thus, a policy agenda that is committed to being research-based must be prepared for some rethinking when research findings are not replicated and conclusions are refined or altered.

14.6 Mass media and social media

In many countries, public concern about alcohol-related problems only occasionally finds political expression. For example, concerns about drink-driving, drunken disorders in city centres or at cultural festivals, and the behaviour of intoxicated football supporters have periodically changed public opinion about the need for a particular alcohol policy. Such concerns are often brought to public attention by news coverage and commentaries in the mass media, which can have a significant influence on the policy debate at national and local levels (Milio 1987). Media coverage has an 'agenda-setting' function (Erbring *et al.* 1980) by influencing whether policymakers perceive the existence of a problem and attach enough importance to it to warrant an appropriate response.

The media's framing of alcohol issues, as with other commercial determinants of health, has varied markedly, influenced by two contrasting frames and focuses—one on individual responsibilities and 'market justice' frames, employed by corporate

interests, and the other on the need for population-level interventions and 'social justice' frames, deployed by public health advocates (Weishaar *et al.* 2016). In media coverage of the debate on minimum unit pricing (MUP) in Scotland, the views of alcohol producers and think tanks opposed to MUP were strongly polarized against those of public health advocates and health charities in favour of the policy (Fergie *et al.* 2019). Opposition by spirits industry trade associations to a proposed increase in excise tax on spirits in Poland focused primarily on the possibility of increased illicit alcohol, while health issues were largely absent from the media debate (Zatoński *et al.* 2016).

The media can also establish the credibility of commentators on current issues (Flora *et al.* 1989) such as references to industry actors as experts during the debate on alcohol policy in Vietnam (Casswell 2020). But it should be kept in mind that the relationship between the media and the policy process is inherently bidirectional—while 'the media can have effects on the policy process as a mechanism for both positive and negative feedback, … it is also a recipient of the outputs of these political processes' (Russell *et al.* 2016).

The importance of the media in shaping the policy debate has led to increasing use of media advocacy among public health professionals engaged in national and local policy debates (Chapman and Lupton 1994). 'Media advocacy' refers to strategic collaboration with the media to advance policy goals. Media advocacy has been undertaken as a component of multifaceted community action initiatives, resulting in increased media coverage of alcohol policy (Stewart and Casswell 1993; Wallin *et al.* 2004), and in connection with regulatory changes, law enforcement, community mobilization, and monitoring of high-risk behaviour (Treno *et al.* 1996; Treno and Holder 1997; Holder and Treno 1997).

The use of media by different interests in the policy arena has been changed markedly by the expansion of online social media. Whereas public health advocates experienced constraints on access to traditional media coverage because of the shared commercial interests of the media and the alcohol industry, information dissemination in the social media is more direct and less susceptible to such constraints, despite social media's deep involvement also with paid alcohol industry promotion (see Chapter 9). Social media communication thus reflects both commercial and health interests. For example, industry-funded SAPROs have been found to be less likely than independent NGOs to tweet about alcohol marketing or pricing and less likely to mention health harms, including cancer (Hessari *et al.* 2019). On the other hand, analysis of tweets during the Scottish debate on MUP found evidence of a coordinated response by public health organizations focusing on a single message—that MUP reduces alcohol-related health problems (Wright *et al.* 2019).

14.7   Public health interests and the formation and implementation of policy

In recent decades, scientists from many disciplines have paid substantial attention to how policy agendas are set, decided on, and implemented. Much of this work initially focused on high-income countries, but studies in the same tradition have since considered a broader range of countries (Gilson *et al.* 2018). The ideal scenario of a core

group of policymakers pursuing policy goals in a clearly defined and well-ordered process does not describe the complexity and unpredictability of public policymaking. No matter what type or level of governance is considered, the process is rarely simple and straightforward—particularly where there are conflicting interests at stake, as is usually the case with alcohol policies. In such cases, the policy process is often immobilized and policymaking is a matter of 'punctuated equilibrium' (Baumgartner and Jones 1993), with long stable periods and occasional moments of large-scale policy change set off by 'focusing events' (Birkland and Schwaeble 2019).

International public health interests have had to recognize this complex process, particularly in the context of the WHO's push on NCDs. Effective prevention of NCDs requires attention to a variety of factors in multiple sectors, including agriculture, finance, trade, transport, urban planning, education, and sport. In this context, the WHO (2008) has called for 'multisectoral actions' involving high-level policies and plans. Such efforts on alcohol have frequently proved challenging for the public health interest because of industry interference with the policy development and implementation process, as was found in a study of NCD policy in five African countries (Juma *et al.* 2018). A related study of the multisectoral process in alcohol policy development in Malawi pointed out that the development of a national alcohol policy was very protracted, lasting 8 years. This was attributed to interference by the industry, along with a lack of government resources (Mwagomba *et al.* 2018). The policy document that resulted from the process refrained from addressing tax increases on alcohol or enforcement of bans on alcohol advertising, two of WHO's recommended 'best buys' for policy. Such experience raises questions about whether multisectoral activities involving the alcohol industry is a productive path forward for alcohol policy.

In order for evidence to influence policy, Cairney (2015) argues that researchers need to draw on a number of policy theories to inform their work. One theory, the Advocacy Coalition Framework (Pierce *et al.* 2020), is relevant to long-term collaborative efforts that include researchers, along with advocates, policy advisors, and policymakers. Another theory, the 'Triangle that Moves the Mountain', describes a model predominant in Thailand. It consists of an alliance among three sectors working to influence alcohol policy: (1) professionals and researchers; (2) social mobilization through NGOs and networks; and (3) sympathetic public agencies and politicians (Thamarangsi 2009). In the application of this approach, 'windows of opportunity' (Kingdon 1995), a committed health minister, and cultural factors also contributed to the success of public health policymaking on alcohol in Thailand.

The question of an appropriate governance mode for coordinating multisectoral activities on a substantial health risk problem has been addressed in the context of obesity, another risk factor for NCDs with strong commercial interests involved (Khayatzadeh-Mahani *et al.* 2018). After pointing to the disadvantages of a shared governance model, where all interests have a voice, and of a lead organization model, where an existing broad-ranging government department takes on the leadership, the analysis suggests the use of 'network administrative organization governance', where a new and separate legal entity takes on the function of leadership and coordination. However, the most common models of leadership in relation to alcohol policy are the shared governance and lead organization modes. Thailand provides an example of a comprehensive system of shared governance with four national authorities and a

series of provincial committees legally mandated to implement alcohol control legis-
lation, with the peak national body chaired by the prime minister. The Thai Health
Promotion Foundation (ThaiHealth) is a separate legal entity outside the Ministry of
Health which supports civil society and social marketing; it has earmarked funding
derived, in part, from a small alcohol tax levy (Pongutta *et al.* 2019). ThaiHealth is not
a unique example of such earmarked taxation for health promotion. In 2020, it was
one of eight similarly constituted members in seven diverse Asia-Pacific countries of
the International Network of Health Promotion Foundations (https://inhpf.net/).

Another alternative might be assignment of the leading and coordinating role to
a government alcohol monopoly where one exists. As noted by Room and Cisneros
Örnberg (2019), monopolies adhere closely to sales restrictions (to underaged or in-
toxicated customers), do not have private profit motives, and are constrained from
lobbying to increase sales. In the Nordic alcohol monopolies (e.g. Rossow and
Grøtting 2021), there is a strong social responsibility profile and commitment to serve
as a public health instrument. But such an arrangement only makes sense where the
alcohol control and public health and welfare functions of the monopoly take priority
over its revenue-raising functions, which has often not been the case in the history of
government monopolies of alcohol and other drugs (Room 2020).

Models of effective policymaking and implementation to minimize alcohol-related
harms require moving beyond the health sector and adoption of an understanding
of the systemic nature of the problem, rather than a focus on individual behaviour
(Khayatzadeh-Mahani *et al.* 2018). Effective models are also likely to require an open-
ness to working with researchers, professional groups, community organizations, and
government departments, and an ability to exclude vested economic interests from
the agenda setting. As the experiences noted earlier suggest, this last precondition is
perhaps the most important for effective policymaking in the interest of public health
and welfare. For tobacco, the Framework Convention on Tobacco Control mandates
the exclusion of the tobacco industry. In the public health interest, a similar inter-
national norm is needed for alcohol.

14.8 Conclusion

Within each jurisdiction addressing alcohol policy, there are parallel and competing
processes as different interest groups attempt to set the agenda and influence the out-
come. Groups involved in for-profit alcohol production and sales have increasingly
become key players in policy debates. NGOs, professional organizations, and con-
cerned individuals are voices on behalf of the public interest in many jurisdictions,
and those who communicate research findings are also players in the policy arena.
The media serves as a forum where policy questions can be raised and debated, often
making their own contribution to how issues are defined and agendas set.

Alcohol is not an ordinary commodity because it requires an extraordinary amount
of public policy attention in the form of regulation, taxation, and human services to
address and pay for the damage it causes. An appreciation of the various players in the
alcohol policy arena can heighten our understanding of the following fundamental
conclusion—alcohol policy is often the product of competing interests, values, and

ideologies. As this chapter has suggested, industry interests diverge considerably from those of public health professionals and NGOs. Experience suggests that working in partnership with the alcohol industry is likely to lead to ineffective policy in terms of public health and welfare.

In a society or community in which drinking alcohol is a regular part of life for a substantial part of the population, alcohol policy is not a simple matter of adopting a comprehensive policy once and for all. New problems and issues will arise, new interests will be expressed, and new measures or procedures must be considered. The WHO Global Strategy's call for a 'comprehensive and intersectoral' national policy has been interpreted as a national process involving multiple interests and institutions, including commercial interests and the alcohol industry. Given the conflicting interests involved, efforts to enact alcohol policy with one big 'multisectoral action' have had only limited success.

The process of alcohol policy creation, in each country and internationally, needs to be better understood and more responsive to the end-consumers of emerging policies. Too much of the action in the alcohol arena is conducted behind the scenes, subject to political considerations and vested interests. Uninformed by science, and insufficiently monitored in its outcomes, such alcohol policy is often neither evidence-based nor effective.

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15

Economic interests, public health priorities, and global governance of alcohol

15.1 Introduction

The strategies and interventions covered in Chapters 7–13 of this book are designed to be implemented at national or subnational levels, but they are strongly influenced by the situation at the international level. In the absence of a body of international law, the global governance arena in relation to alcohol is predominantly influenced by a network of regional, multilateral, and bilateral agreements, some focused on trade and investment, increasingly including e-commerce issues, and some with a broader configuration such as the European Union (EU) or the Association of South East Asian Nations (ASEAN). In recent decades, the operating assumption in international agreements has been to treat alcoholic beverages as ordinary commodities such as bottled water, milk, coffee, and tea. As discussed in Chapter 5, the globalization of alcohol producers has meant that national and local control policies have increasingly come under pressure from the **transnational alcohol corporations**[1] (TNACs), with marketing strategies directed by their headquarters, located mostly in a few HICs. At the beginning of the twenty-first century, the digital platforms, the data analytics of which target consumers, and global organizations such as FIFA (the international soccer federation) have partnered with alcohol brands and joined the TNACs in a global influence matrix affecting alcohol policies. This global environment has impacts on alcohol policy both by directly undermining the efficacy of national-level policies, such as attempts to restrict marketing, and by influence at the global level to undermine a global multilateral response (Casswell and Rehm 2020).

   This chapter describes these international pressures and the limits they impose on national and local alcohol policies, as well as the prospects for alcohol control at the international level. It is argued that the current threats to effective alcohol control from international trade and investment, cross-border marketing, and other aspects of globalization are significant and could be mitigated by purposive action at the global level in the interests of public health and welfare.

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

15.2 Trade and investment agreements as a threat to alcohol controls

Bilateral, and even regional, trade agreements have been a major part of the picture of international trade throughout history. In earlier times, these measures were often implemented to protect national industries or state tax income. In the half-century after the Second World War, the primary focus of trade negotiations and agreements shifted to reducing such national barriers to international trade, as a major way to promote global economic development. At the beginning of the twenty-first century, there were altogether 127 regional and other trade agreements registered at the World Trade Organization (WTO) (Andriamananjara 2001).

Initially, the post-war agreements focused on reducing barriers to trade in commodities. More recently, agreements have also been reached on services and protection of investments and intellectual property. As the reach and power of transnational corporations grew, there was increased emphasis on preserving private interests across national boundaries. At the global level, multilateral trade agreements had become the business of the WTO, which, in 2020, had 164 member states (World Trade Organization 2020), with most non-member states (located mostly in north Africa and the Middle East) identified as an 'observer negotiating accession'.

However, after 2010, the trade negotiating picture became more fragmented. The coronavirus disease (COVID-19) pandemic has highlighted the willingness of nations to resort to unilateral actions in the face of medical supply shortages (Stewart 2020). While the WTO has continued as a world trade body, registering agreements and disputes, there has been a shift in emphasis in trade negotiations to bilateral and regional 'trade and investment agreements' (TIAs), such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) that Australia, Canada, Japan, Mexico, and seven other countries signed in 2016, and the Regional Comprehensive Economic Partnership (RCEP) signed in 2020—the largest ever regional TIA, comprising economies worth US$25 trillion in 2019 and half of the world's population, including China. The development of these mega-regional TIAs reflects the interests of transnational corporations in new types of trade rules that were not even up for discussion at the WTO. Companies involved in global supply chains, such as the alcohol industry, are most concerned with non-tariff barriers to trade (Bown 2017). Advances in technology, manufacturing, and service sectors (e.g. e-commerce) were not covered by existing WTO agreements, and the new generation of TIAs are more about investment than trade. 'They provide legal infrastructure for a global reorganisation of production in which cross-border trade takes place within the networks of affiliates, contractual partners, and suppliers of transnational corporations, which coordinate as much as 80% of world trade' (McNeill *et al.* 2017a, p. 760).

In signatory countries, this legal infrastructure impacts on their ability to regulate their markets to fulfil health and welfare aims (McNeill *et al.* 2017a), including alcohol control policy. For example, the introduction of new public health measures, such as requirements for alcohol **warning labels**, has led to claims made under investment agreements that the state failed to accord 'fair and equitable treatment' to the company's investment or that it 'indirectly expropriated' the company's investment (Mitchell and O'Brien 2020). The effect of these agreements is often 'regulatory

chill'—less affluent countries are dissuaded from action by the mere threat of expensive legal actions (Kelsey 2017). This is illustrated by the outcome of the case against Australia's introduction of plain packaging of tobacco which, while successful, took 7 years and cost A\$24 million. Australia recovered only A\$12 million from Philip Morris (Ranald 2019), and this challenge resulted in regulatory chill in other countries (Crosbie and Thomson 2018).

15.2.1 Dispute settlement systems

Trade agreements operate within robust dispute settlement systems and sanctions provided for in TIAs, in which the agreements can take precedence over health and welfare issues (Lang 2016). The parties to international trade agreements are mostly nation states (or economic blocs such as the EU). However, one of the differences in the new generation of TIAs is that, in some cases, corporations and industry organizations are allowed to pursue lawsuits directly against a nation. These investor-state dispute settlement (ISDS) provisions are included in many of the roughly 3000 bilateral investment treaties now in force, and increasingly also in new regional trade agreements. They allow foreign investors, but not domestic firms or citizens, to challenge national laws and policies (McNeill *et al.* 2017a). Because companies often have legal presence in multiple countries, they can initiate ISDS cases under whichever TIA offers the most advantageous provisions (McNeill *et al.* 2017b).

These adjudications often go counter to a public health interest which is valued by a national or subnational government. Decisions on balancing these interests are made by the trade adjudication system in accordance with the provisions in the relevant trade agreement and are not subject to appeal outside that system. However, the existence of a health treaty in relation to a specific health topic, the **Framework Convention on Tobacco Control** (FCTC) (World Health Organization 2020a), has been influential in trade disputes in the WTO system, being referred to as a source of authoritative evidence relating to tobacco control, including the effectiveness of public health measures (O'Brien 2021). Another context in which economic issues have been counterbalanced by health and welfare concerns is the EU, which has taken on broader concerns and responsibilities beyond trade, including public health and other public interests (Greer 2014; Council of the European Union 2017; Bartlett and Garde 2017). This has meant that public health considerations are now more systematically taken into account in decisions on trade disputes under EU jurisdiction than in other trade agreements (Holden and Hawkins 2018). Other indications that the hegemony of commercial interests in trade policies may be weakening was the widespread concern from a range of actors expressed over the implications of having extended the right to dispute to private parties through the ISDS mechanism (McNeill *et al.* 2017b) and the decision to exclude the mechanism from a mega-regional agreement, the RCEP, signed in 2020.

15.2.2 The equal treatment principle and its effect on alcohol policies

One of the core principles of the WTO and, more generally, of TIAs has been that participating countries must not discriminate between domestic sellers and those from abroad (Grieshaber-Otto *et al.* 2006). Tax and regulatory measures thus cannot be applied as protection for domestic production against imports.

Under the equal treatment principle, TIAs have been used to attack the operations or existence of state alcohol enterprises and monopolies (e.g. Room *et al.* 2006). While most such agreements recognize the right of partner countries to run monopolies, their activity is restricted, since they tend to reduce opportunities for imports and the TNACs. Finland, Iceland, Norway, and Sweden were thus compelled to privatize their import, export, wholesale, and production monopolies for alcoholic beverages when they entered the European Economic Area (EEA) agreement, although they have managed to retain their off-premise retail monopolies for alcoholic beverages (Holder *et al.* 1998).

The treatment of domestic and foreign goods on equal terms brings up the question of what should be construed as substitutes or like commodities. In a case against Chile, for instance, the WTO panel ruled that imported spirits with higher alcohol content than the Chilean liquor **pisco** could not be taxed at higher rates because this had the effect of protecting domestic liquor production (Grieshaber-Otto *et al.* 2000; Zeigler 2006). Trade dispute decisions have thus not always accepted either the usual public health 'volumetric' position that, from the perspective of harm prevention, equality in tax rates for different alcoholic beverages should mean an equal rate for the same amount of pure alcohol (Meier *et al.* 2016) or the alternative position of a somewhat higher tax per unit of ethanol for stronger beverages.

Because different national tax rates are seen to interfere with the efficient operation of the single European market, the EU since 1972 has attempted to harmonize alcohol excise duties by administrative decisions (Österberg and Karlsson 2002). However, this has usually resulted in pressure to lower, rather than raise, duties, particularly because the wine-producing countries have insisted that the minimum wine tax stays at zero. Given that the single-market rules do not allow reasonable limits on how much alcohol can be brought in by cross-border travellers, lowering alcohol tax rates has also been used, for instance in the Baltic countries (Montalto Monella and Harris 2019), to encourage tourism and increase travellers' alcohol imports to their home country.

15.2.3 Health labelling of alcohol as a trade issue with public health implications

In the twenty-first century, labelling of alcoholic beverages has become a major issue at the international level between public health and alcohol industry interests. The issue has been addressed in the WTO under the Agreement on Technical Barriers to Trade (TBT), in new bilateral and multilateral TIAs, and the Codex Alimentarius, a set of standards, guidelines, and codes of practice governed by a commission established

by the intergovernmental Food and Agriculture Organization (FAO) and the WHO to protect consumer health and promote fair practices in food trade (see Box 15.1).

There have been three main areas of contention between alcohol industry and public health interests in relation to alcohol labelling: (1) the content of warning labels; (2) the listings of nutritional composition and ingredients applicable for food-stuffs in general; and (3) the 'valuable real estate', as the industry regards it; this is space on the alcohol container which the industry wants reserved for promotional labelling (O'Brien 2014). In each area, the industry is opposed to health warnings and nutrition labels, except in cases where industry groups or their paid surrogates control the labelling process (O'Brien and Mitchell 2018; Varallo and Cravetto 2018). From a public health perspective, alcohol labelling is part of a comprehensive alcohol control strategy not only as an educational message, but also as an element disrupting the marketing function of labelling and packaging of alcohol products (see, for example, Box 14.2).

Health warning labels are usually short messages such as 'alcohol is a cause of cancer', 'pregnant women should not consume alcohol', and 'alcohol impairs driving ability'. By 2020, the WHO's Global Information System on Alcohol and Health reported that 47 countries require some kind of health warning label on alcohol containers (Stockwell *et al.* 2020). The increasing concentration of the alcohol industry (see Chapter 5) has been accompanied by attempts by TNACs to place international limits on national labelling requirements, acting through national delegations at trade and other intergovernmental fora.

Box 15.1 There are no international standards on alcohol labelling—even the standards for foodstuffs do not apply

The Codex Alimentarius Commission sets international standards for the labelling of foodstuffs. Alcohol is considered to be in the foodstuff category, but as of 2022, the standards do not apply to it (Hepworth *et al.* 2021). The 2017 meeting of the Codex Food Labelling Committee accepted a proposal from the WHO that it consider setting standards for alcohol labelling, with product information such as 'ingredients, alcoholic strength, standard drinks, calories and allergens' (O'Brien and Mitchell 2018, p. 155). Health warnings and warnings on age limits were also mentioned by participants as matters for potential labelling. But substantial opposition was also expressed to the Codex moving forward on this, with suggestions that the matter be left in the hands of industry groups or addressed at a national level (Codex Commission 2019a, para. 117). In 2020, the Codex Secretariat made a further request for comments on labelling of alcoholic beverages (Codex Commission 2019b), but the coronavirus disease (COVID-19) pandemic slowed down any follow-up on this. Alcohol industry bodies are involved in the process, with a primary interest in avoiding the adoption of any international standards, and in the meantime 'for a delay in the decision-making … Health member consultation groups at the national level likewise report that alcohol industry representatives pressured national decision-makers to postpone any decisions on labelling' (Hepworth *et al.* 2021, p. 13).

One forum where labelling issues have been debated at the international level is the TBT Committee of the WTO, which has been described as an informal form of resolution of trade conflicts (Horn *et al.* 2013). While there have been TBT discussions of other perceived obstacles to alcohol trade caused by public health considerations, O'Brien and Mitchell (2018) found that the most common alcohol issue discussed at the TBT Committee meetings was labelling, which was raised 14 times between 2000 and 2017. These were mostly objections from the EU and seven other (mostly wine-producing) countries to the Thai government's proposed plan for rotating graphic warning labels. With Thailand under threat from the objections and implied threats of lawsuits, the warning label legislation was abandoned (Treerutkuarkul 2017).

Thus, the general stance of industry interests, and of government delegations they have enlisted, is to use the international arena to avoid government requirements for health information to be on the product's label, whether through avoiding international standards for such information or through restrictions through TIAs on government label requirements. Instead, industry groups propose voluntary labelling options developed by industry groups or allies that are not consistent with effective health communication practices (Tinawi *et al.* 2018).

15.2.4 The public health exception in trade treaties

Recognizing that the interests of public health and of commerce, including free trade, may conflict, Article XX of WTO's General Agreement on Tariffs and Trade (GATT) treaty provided a public health exception, using a 'necessity test' to limit the application of trade treaty provisions in case of such conflict—that nothing in the treaty should be construed as preventing a country from adopting or enforcing a measure considered necessary to protect human life or health. However, the introductory language at the head of this article (its 'chapeau') specifies that this exception is not made where the measure discriminates between countries where the same conditions prevail or is a disguised restriction on international trade, and parallel provisions can be found in other TIAs (Chaisse 2013; O'Brien *et al.* 2017, p. 387). Both how much the measure is necessary to public health and how much it interferes with trade and investment thus need to be taken into account in a series of 'balancing tests', if a measure adopted in the interests of public health is to be successfully defended in trade disputes and courts (McGrady 2011, pp. 136–69).

A crucial issue in determining the necessity of a measure is whether there is an alternative measure that could be adopted which would be less restrictive of trade, but as effective as the challenged measure. In the case of Thailand's unsuccessful attempt to use graphic warning labels on bottles, the US government reportedly agreed to pay for Thai officials to travel to Washington to meet with US alcohol experts to learn about alternatives to graphic warning labels (Barta and Passariello 2010). It is not clear whether adjudicating judges or panels, with little background in public health, will be able to fully take into account that the alternative measures may not be effective or that the measures may be complementary, rather than alternative, in their effects. McGrady (2011, pp. 141, 168) comments that 'WTO panels have a high degree of discretion in application of the necessity test' and notes 'the general uncertainty

that pervades application' of the test. The net result then is that while there is a public health exception in the trade treaty system, it is both limited and uncertain in its application. In 40 cases before the WTO Dispute Settlement Body prior to 2010, when the health exception was raised, in only one case, relating to asbestos, was the argument upheld (McNeill *et al.* 2017b). However, the ISDS provisions in some agreements in the new generation of TIAs include explicit safeguards to protect the public interest; for example, the 2020 Australia–Peru bilateral agreement contains such explicit safeguards protecting the Australian government's right to regulate in the public interest (Parliament of Australia 2018, paragraph 2.23).

15.2.5 Regulating alcohol marketing in the digital world

Alcohol marketing by the globalized alcohol industry, with transnational frameworks for distributing messages and collecting consumer data, bypasses national and regional jurisdictions and their frameworks of monitoring and control. While satellite television continues to be used in areas with limited Internet access, such as in parts of Africa, the enormous expansion of connectivity has made digital platforms increasingly a preferred option for TNACs to roll out global campaigns for global brands (see Chapters 5 and 9).

Under the framing of 'digital trade' protections, the new generation of TIAs include protections of digital platforms from national-level oversight. The first such comprehensive legal text, included in the CPTPP, reflected the technology platforms' concerns and prevented what the industry called 'forced localization', meaning the platforms are not susceptible to legal challenge in jurisdictions in which they market (as described in the example in the next paragraph); the text also protects against disclosure of source codes and algorithms (Kelsey 2020).

The value of the protection against 'forced localization' for digital platforms was demonstrated in France in 2013, when the French National Association for Prevention in Alcohology and Addictology (ANPAA) took Heineken and Facebook to court for breaching the law, including: use of 'click-throughs' that they said triggered unauthorized and intrusive advertising; use of a platform likely to be accessed by youth; and a lack of age screening to authorize access. However, Facebook was held not legally responsible on the grounds that Facebook was hosted and operated from the United States and Ireland. In other words, the French law, the Loi Évin, could not apply to Facebook. This issue of a local presence of digital platforms has major implications for attempts to control digital alcohol marketing at the national level (Kelsey 2020).

There is growing concern over the size and practices of digital platforms. Governments, commerce, and consumer watchdog agencies around the world have carried out investigations into issues of the market power of digital platforms and the effect on competition and democratic debate, the circulation of disinformation and other forms of dangerous or offensive speech, and individual privacy and harm to vulnerable consumers, including children, from data collection and targeting. An Australian report (Australian Competition and Consumer Commission 2019) was distinctive because of the way it focused on both competition and consumer protection. However, in these debates, little attention has been paid to digital platforms as

marketers of hazardous products such as alcohol, despite the public health implications of the ability to target individuals based on previous and probable behaviour in a way never possible before (Andrew 2019; Room and O'Brien 2021).

Many efforts at the national level to respond to digital marketing have not, in fact, responded to the new marketing infrastructure the digital platforms provide, remaining focused on attempts to control content and exposure. For example, with data on individual consumers harvested by the platform, programmatic trading has evolved to deliver advertising targeted at the individual, rather than advertising directed at mass homogenous audiences. Since the audience for a particular advertisement is determined by their previous choices on the platform, a focus on the content used to attract audiences is therefore less important to advertisers (and less relevant to regulatory responses) (Andrew 2019). Jurisdictions which have in place complete bans on alcohol marketing, e.g. Norway, have included digital alcohol marketing, although enforcement appears to have been spotty (Rossow 2021). Finland's effort to limit digital marketing of alcohol appears to have had some success, but an evaluation of it underlines the difficulty of an approach focused on limiting content (Katainen *et al.* 2020). Tobacco provides a contrast with alcohol where, possibly reflecting both the presence of the normative influence of the FCTC and national-level bans, tobacco digital marketing is less widespread.

15.3 Views and actions of development agencies: alcohol mostly viewed as a plus for economic development

International development and financial agencies, such as the International Monetary Fund (IMF) and the World Bank, have often had major effects on alcohol policies at national and local levels. Although industrialization and concentration of alcohol production and distribution play an ambiguous role in economic development, bringing losses as well as gains (Room and Jernigan 2000), international development agencies have assumed that more developed and integrated alcohol industries are a gain for development in economic terms and have often taken little or no account of the costs in terms of health and social harms.

They have also generally had a strong ideological bias against government ownership of production or distribution (Reinsberg *et al.* 2020). They have often encouraged dismantling or sale of government monopolies as a condition of development grants—particularly in structural adjustment programmes for countries with financial difficulties, without any differentiation of alcoholic beverages from other commodities, despite the advantages of government alcohol monopolies (see Chapter 9) (see also Room and Cisneros Örnberg 2019), where privatization has had a clear negative public health effect (Hahn *et al.* 2012).

International financial bodies have also intervened in the alcohol market by financing new or modernized alcohol production plants as part of a general strategy to promote economic development. For instance, the International Finance Corporation, part of the World Bank Group, only excludes projects from financing where the sponsor is substantially involved in spirits production—not beer and wine (International Finance Corporation 2020). Development assistance to **low- and**

middle-income countries (LMICs) from development agencies and **high-income countries** (HICs) has regularly provided substantial incentives for alcohol production in LMICs. Thus, for instance, in the 2010s, The Netherlands, the United States, Germany, and a United Nations fund gave Heineken US$10 million in subsidies and tax benefits for agricultural projects in Africa; and between 2002 and 2012, the EU gave US$98.6 million to support the rum production industry in the Caribbean (Vital Strategies 2021, pp. 18–19, 31).

In the course of the 2010s, the United Nations Development Programme (UNDP) began to pay some attention to alcohol as a potential obstacle to development. A joint initiative of the UNDP and the WHO on responding to alcohol, violence, and infectious diseases sponsored meetings in Africa in 2014 and 2016 of government and United Nations agency officials and non-governmental organizations (NGOs) to work on 'policy coherence' on harmful use of alcohol, gender-based violence, and human immunodeficiency virus (HIV) (World Health Organization 2021). But plans to extend to Asia were stymied for lack of funding. Along with other development agencies in the Asia-Pacific region, the UNDP sponsored a 2019 report on accelerating progress on the United Nations' Sustainable Development Goals (SDGs). This report identified alcohol harm as an externality and noted that it could be countered by increased alcohol taxation, thereby sending 'a social signal', as well as increasing state revenue (United Nations *et al.* 2019, pp. 26, 31). However, NGO development agencies based in specific HICs, particularly Norway's FORUT (FORUT 2021), have been much more active in providing ongoing support to address alcohol promotion as an obstacle to development in Africa and other low- and middle-income world regions (Bakke and Endal 2014) (https://forut.no/english/).

15.4 International agencies promoting public health and public interest perspectives

The only global intergovernmental agency with a continuing interest in alcohol issues has been the WHO, as discussed below. Among the other 34 intergovernmental bodies considered to be part of the 'UN system' (United Nations 2020), a number deal with general public interests such as social welfare and crime prevention. However, several agencies relevant to alcohol control policies and alcohol harms have shown minimal interest in alcohol issues.

The International Criminal Police Organization (Interpol), for instance, facilitates worldwide police cooperation and crime control. Alcohol is an important element in many aspects of police work, including drink-driving, domestic violence, and street violence. An Australian study, for example, found that one-quarter of police work time was spent on dealing with alcohol-related incidents (Palk *et al.* 2007). Yet the alcohol component in crimes involving violence or motor vehicles seems not to be addressed at all by Interpol; the only items on alcohol on Interpol's website in September 2019 were concerned with an issue of primary interest to transnational alcohol producers—'fake alcohol', containers of alcoholic beverages with a phony brand label.

For another example, while the United Nations Educational, Scientific and Cultural Organization (UNESCO) has a wide topical mandate, its only recent involvement with

alcohol issues appears to be a 2017 booklet on 'Education sector responses to the use of alcohol, tobacco and drugs', produced in partnership with the United Nations Office on Drugs and Crime (UNODC) and the WHO (UNESCO 2017). Other UN agencies have developed partnerships with TNACs; for example, the United Nations Institute for Training and Research (UNITAR) has partnered on drink-driving projects with Diageo (Casswell 2019).

These cases, and the World Bank case mentioned earlier, exemplify the minimal, sporadic, and sometimes problematic involvement with alcohol issues of the global intergovernmental agencies, other than the WHO. However, in 2018, in the context of the United Nations' SDGs (https://sustainabledevelopment.un.org/), a unique cross-agency initiative, SAFER (https://www.who.int/initiatives/SAFER), promoting the most effective alcohol control policies, was initiated. This is led by the WHO but includes the United Nations Inter-agency Task Force and the UNDP, as well as four of the major NGOs in the field.

The WHO's interest in alcohol issues has been long-standing, but not continuous. While the mental health division of the WHO took an early interest in alcohol issues in 1950–1955, a continuing interest only got under way in the early 1970s, both in the WHO's headquarters in Geneva and in its European regional office in Copenhagen (Room 1984). The capstone of this period of work was a 1983 World Health Assembly resolution on 'Alcohol consumption and alcohol-related problems: Development of national policies and programs' (World Health Assembly 1983). During Reagan's presidency, withdrawal of US support from the WHO as a whole was threatened if the WHO continued work in a cooperative project on public health implications of alcohol marketing. In the wake of the successful WHO campaign for the FCTC, alcohol industry representatives increasingly saw the WHO and public health advocacy as a threat to their interests, and worked in various ways to neutralize it (Room 2006). While some work on WHO-sponsored projects on alcohol continued during the 1980s and 1990s, particularly in the areas of screening, diagnosis and treatment, the alcohol policy work was constrained in scope and went through several reorganizations (Room 2005).

The WHO's focus on alcohol as a global public health issue revived in the mid-2000s, with the passage of a Nordic-initiated resolution in the World Health Assembly in 2005 (Bull 2005), leading to a Global Strategy on alcohol adopted in 2010 (World Health Organization 2010). From 2008 onward, WHO's work on alcohol was mostly incorporated into two overarching priority agendas. The first addressed **non-communicable diseases** (NCDs). Alcohol consumption was identified as one of four major risk factors for NCDs. This increased alcohol's priority among public health goals, both in the WHO and through NGOs such as the NCD Alliance (https://ncdalliance.org/), a global alliance of more than 1000 NGOs. On the other hand, alcohol had one of the less ambitious goals, a 10% worldwide reduction in consumption, and a 2018 review of global progress on reducing NCDs by an independent high-level commission found that such 'progress has been limited' (World Health Organization 2018, p. 14).

The other overarching priority agenda has been the United Nations' 17 SDGs (https://sustainabledevelopment.un.org/), adopted by the United Nations General Assembly in 2015. The WHO took on special responsibility for goal 3, concerned with health and well-being, which included subgoal 3.5, to 'strengthen the prevention

and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol', a goal which looked beyond alcohol's role in NCDs. However, the United Nations context was particularly open to multisectoral activity involving private interests, and, in a 2019 multisectoral 'global action plan' on goal 3, signed by 12 international organizations, but coordinated and published by the WHO, coverage of alcohol is sparse (World Health Organization 2019). Other elements of the SDGs include commitments to further trade liberalization and emphasis on partnerships with the private sector, elements that leading alcohol producers have been using to 'project themselves as partners in progress rather than as vectors of an industrial epidemic' (Collin and Casswell 2016, p. 2582). And in a Global Burden of Disease study using trends in the period 1990–2017 to project progress in the attainment of 40 health-oriented SDGs by 2030, the alcohol indicator was in the lowest quartile of rates of improvement (GBD 2017 SDG Collaborators 2018, Table 2). While the SDG initiative does not provide new mechanisms to achieve the aspirational goals, it has provided a strong thrust on measurement of the indicators agreed for SDG 3.5, which, in turn, have been used to inform the targets and indicators for WHO's Global Strategy on alcohol.

At the May 2019 World Health Assembly, it was resolved to review progress under the Global Strategy and chart paths forward. After consultations with member states, WHO regional offices, NGOs, and alcohol industry interests, a February 2020 resolution of the WHO Executive Board concluded that, after a decade of work pursuant to the Global Strategy, 'the overall burden of disease and injuries attributable to alcohol consumption remains unacceptably high', and that the 'resources and capacities' for the implementation of the Strategy 'do not correspond to the magnitude of the problems' (World Health Organization 2020b). The resolution also ordered the development of an Action Plan for 2022–2030 to be considered at the 2022 World Health Assembly and a review of the Global Strategy in 2030, and proposed that WHO's work on alcohol should be 'adequately' resourced (World Health Organization 2020b).

Resources and staffing devoted to WHO's work on alcohol remain meagre—a handful of staff, in full-time equivalent terms, as compared to dozens of staff for tobacco in the WHO and FCTC secretariat, and hundreds of staff for controlled drugs in the UNODC. In 2018/2019, the total annual budget for work on alcohol in WHO headquarters was US$1 million, a marked contrast with US$8.8 billion available for tobacco control. Neither member states nor philanthropies made any substantial extra-budgetary funding available for alcohol control (Bakke *et al.* 2020).

15.5 Implications: the need for a binding international agreement

There was a moment in history, more than a century ago, when a series of agreements on the international level attempted to control the market in 'trade spirits' by forbidding exports to most of Africa (Bruun *et al.* 1975, pp. 165–73). But since the Second World War, there have been almost no international-level agreements that seek to limit alcohol-related harms. It is clear that economic policies at the international level have considerably limited the ability of nations and local governments to control

alcohol consumption and related problems (see Section 15.2), while virtually nothing has been done at the international level that would enhance the ability of governments to control alcohol problems.

This is quite different from the situation for other psychoactive substances that have implications for public health. A series of international agreements, dating back to the European colonial era at the beginning of the twentieth century, have established a common system for the control of opiates, cocaine, and cannabis (Bruun *et al.* 1975) which is still largely intact. The contrast between alcohol and controlled drugs in the overall burden of disease from non-medical use is stark. The Global Burden of Disease estimate for the burden from alcohol in 2016 is over four times greater than the burden from all drugs under international control, taken together (GBD 2016 Risk Factors Collaborators 2017), highlighting the inadequate global response to alcohol.

A possible model for future international agreements on alcohol is the FCTC (World Health Organization 2020a), the first treaty negotiated under the WHO's authority to negotiate 'agreements' or 'conventions' (Gostin *et al.* 2015). There are similarities between the situations of alcohol and tobacco. Both are widely available and commonly used psychoactive substances, with substantial dependence potential and devastating effects on health. And most importantly, consumption and harm of both substances are driven by industry practices of supply and marketing in the interests of increasing sales and profits.

The WHO FCTC 'reaffirms the right of all people to the highest standard of health' and represents a paradigm shift in developing a regulatory strategy to address addictive substances (World Health Organization 2020a). In contrast to the previous drug control strategies, the WHO FCTC asserts the importance of demand reduction strategies, as well as supply issues. The FCTC has been lauded as a model in the area of global health governance and has had some notable achievements in areas of public awareness, social mobilization, agenda setting, and public health surveillance (Lee *et al.* 2016). An important function of the FCTC has been to establish a dedicated international secretariat responsible for tracking, advising, and aiding member states in its implementation, and an annual conference of relevant parties to monitor progress and discuss additional measures. A review of studies of the impact of the FCTC in its first decade found that 'tobacco control policies are effective when they are implemented according to the Treaty and its guidelines. However, the overall rate and extent of global progress in the implementation of the provisions of the Convention remain uneven across countries and policy domains' (Chung-Hall *et al.* 2019, p. s123). Thus, one study (Hoffman *et al.* 2019) shows that European countries and HICs elsewhere have had accelerated decreases in consumption, which is consistent with other studies documenting the efficacy of the policies the FCTC promotes when they are fully implemented (Jha and Peto 2014; Gravely *et al.* 2017; Chung-Hall *et al.* 2019). But there is little evidence that progress has been made in reducing cigarette consumption in LMICs and Asian countries, which have increased consumption after ratifying the FCTC, perhaps because of the global strategies employed by the tobacco industry (Hoffman *et al.* 2019) and poor implementation of the FCTC.

A number of arguments have been put forward from a public health perspective for an international binding agreement on alcohol control, with the FCTC often cited as a model (e.g. Anonymous 2007; Room *et al.* 2008; Casswell and Thamarangsi 2009;

Baumberg 2010). This goal has also been adopted by professional organizations (e.g. World Medical Association, American Public Health Association) and international NGOs (e.g. Global Alcohol Policy Alliance, Movendi).

Room and Cisneros-Örnberg (2021) have put forward a proposed draft for a Framework Convention on Alcohol Control (FCAC), pointing to parallels and differences between the FCTC and a potential FCAC. Adjustments from the FCTC will be needed due to differences from tobacco in alcohol's nature, production, and consumption (Casswell and Thamarangsi 2009) and in its capacity to produce acute intoxication. Controls on international trade in alcohol are also needed—an issue missing from the FCTC, although now tackled indirectly with a 47-article Protocol to Eliminate Illicit Trade in Tobacco Products (World Health Organization 2013). A suggested model for international trade controls on alcohol in the public health interest is an adaptation of the time-proven provisions on international trade in opium for medicinal use in the 1961 Single Convention on Narcotic Drugs (Room and Cisneros-Örnberg 2020). The changing global context, such as the enhanced role of TIAs, may also suggest some additional elements; although the FCTC does not refer to TIAs and does not trump them in the global governance environment, the FCTC has been cited as an authority in trade disputes about the gravity of the problems associated with tobacco use and the effectiveness of public health controls on tobacco markets (Barlow *et al.* 2019). Ensuring a similar role for an FCAC would be essential. Finally, an important commercial driver of alcohol harm is the need for producers and distributors to protect their profits, leading to their interference with the development of cost-effective alcohol control policies; the inclusion of a similar clause to the FCTC's Clause 5.3 requiring signatories to the FCTC to protect public health policies from industry interference would be an essential part of an alcohol treaty (Casswell 2019).

15.6 Conclusion: reforming the global governance of alcohol in the public health interest

As discussed earlier, the only substantial international agreements covering alcoholic beverages are trade agreements. There is no binding international agreement on alcohol from the perspective of public health or welfare. In trade agreements, alcoholic beverages are almost always treated like ordinary consumer goods. Even when an alcoholic beverage (e.g. wine) is treated as a special commodity, this is usually because this type of beverage falls within the category of subsidized agricultural products, not because it is considered harmful to public health. Trade agreement provisions are increasingly constraining government measures developed to control alcoholic beverages as special commodities. The increasing application of the equal treatment standard to services and investments, combined with the doctrine of effective equality of opportunities for foreign investments or service producers, is especially problematic for alcohol control policies.

At the intergovernmental level, the prime mover on alcohol policy issues has been the WHO, but it has been hamstrung by a lack of resources and of philanthropic funding and the relative paucity and weakness of international NGOs with a focus on alcohol problems. Also, many alcohol-related problems do not commonly fall under

the rubric of health but are concerns of other governmental agencies such as law enforcement and social welfare agencies. There is thus a need to expand the scope of international collaborative action on alcohol problems beyond the WHO. While there is much that can be done at national and subnational levels, there is also a need for action at the intergovernmental level, a topic to which we return in our concluding chapter.

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16

Alcohol policies: a consumer's guide

16.1 Introduction

The preceding chapters have taken the reader on a long and detailed intellectual journey through the intricacies of alcohol policy. The story of that journey, as outlined in Chapter 1, has been told in terms of the cumulative scientific evidence pertaining to the epidemiology of alcohol consumption and problems (see Chapters 2–4), strategies and interventions to address the problems (see Chapters 6–13), and the process through which alcohol policy can better serve the public good (see Chapters 14–15). The storyline contains elements of both optimism and pessimism. On the pessimistic side, alcohol problems are endemic in many parts of the world, and they are increasing in geographic areas that have experienced recent economic growth (Manthey *et al.* 2019). Beyond the epidemiological evidence, a new area of research, described in Chapters 5 and 14, demonstrates that the alcohol industry, previously ignored as a topic of alcohol policy research, has emerged as a key contributor to the problematic use of alcohol and a major obstacle to an effective policy response.

On the positive side, research described in Chapters 7–13 demonstrates that a number of strategies and interventions are effective, well tested, and capable of reaching much of the world's population. In this final chapter, we now make explicit the connection between the empirical research of the alcohol policy scientist and the practical needs of the policymaker who wants to implement evidence-based responses to the problems caused or exacerbated by alcohol. Our intention is to make science useful at the front lines of alcohol policy in the real world.

16.2 A summary of the evidence

Building on previous work in this area (Brand *et al.* 2007; Anderson *et al.* 2009; Nelson *et al.* 2013), the authors developed a relatively simple method to synthesize the results of our review of the policy options. Table 16.1 lists the seven policy areas that were reviewed in Chapters 7 to 13, each category representing numerous strategies and interventions that were rated in terms of their effectiveness and research support, and further evaluated in terms of their population reach and cost to implement and sustain (⊜ see Online Appendix 1 for a description of the rating guidelines). All policy options were evaluated primarily in terms of their ability to reduce alcohol consumption and alcohol-related problems. Intermediate outcomes, such as changes in information, attitudes, and aggressive behaviour, were also noted, but unless an

Table 16.1 Policy-relevant strategies and interventions considered to be Best Practices, Good Practices, or ineffective practices[b]

Policy area	Number of policy options evaluated (number found effective)	Best Practices	Good Practices	Ineffective (or potentially harmful) policies and practices	Comments on mechanisms of action and caveats
Pricing and taxation policies (see Chapter 7)	5 (4)	Alcohol taxes that decrease affordability	Minimum unit pricing; differential pricing by beverage; special taxes on youth-oriented beverages	Policies that increase the affordability of alcohol	When alcohol becomes less affordable, people drink less and experience fewer problems; when affordability increases, so do drinking and harm. Increased taxes reduce alcohol consumption and harm for the whole society, including heavy drinkers and adolescents. The government also gets tax revenues to compensate society for the costs of treatment, prevention, and enforcement. Alcohol taxes need to be substantial to be effective
Regulating physical availability (see Chapter 8)	15 (12)	Limiting hours and places of sale; public welfare-oriented alcohol monopoly; minimum purchase age laws	Rationing systems; restricting outlet density; individualized permit systems; post-conviction preventive bans; encouraging lower-alcohol content beverages; total bans where supported by religious or social norms	Policies that increase outlet density and temporal and spatial availability	Regulating who can consume alcohol, or the places, times, and contexts of availability, increases the economic and opportunity costs of obtaining alcohol. Limitations on physical availability, including convenience and legal access (e.g. age restrictions), reduce alcohol consumption and harms. Controls on availability can be imposed at a population level (e.g. hours of sale) or at an individual level (e.g. as directed by a court order). Availability restrictions can have significant impact if enforced consistently

Table 16.1 Continued

Policy area	Number of policy options evaluated (number found effective)	Best Practices	Good Practices	Ineffective (or potentially harmful) policies and practices	Comments on mechanisms of action and caveats
Restrictions on alcohol marketing (see Chapter 9)	3 (2)	Complete ban on alcohol marketing[a]	Partial bans on alcohol marketing	Industry voluntary self-regulation of marketing	Exposure to alcohol marketing increases the attractiveness of alcohol and the likelihood of drinking by young people; restrictions on marketing are likely to deter youth from early onset of drinking and from binge drinking. Exposure to alcohol images and messages can precipitate craving and relapse in persons with alcohol dependence. Extensive evidence of impacts on drinking and experience from tobacco bans suggest a complete ban is likely to be a Best Practice despite lack of evaluated examples
Education and persuasion (see Chapter 10)	12 (8)		Anti-drink-driving campaigns; targeted prevention programmes; family-inclusive intervention; some interventions with undergraduate students; brief motivational interventions in school settings; computer-based interventions with selective subpopulations of heavier drinkers	Most industry-sponsored programmes and campaigns; information-only programmes	Interventions that focus on high-risk youth and involve the family are more likely to deter youth drinking. Impact generally evaluated in terms of knowledge and attitudes; effect on onset of drinking and drinking problems is equivocal or minimal. Information-based educational messages are unlikely to change drinking behaviour or prevent alcohol problems

Drink-driving countermeasures (see Chapter 11)	15 (13)	Low BAC levels for young drivers; intensive breath testing, random where possible; intensive supervision programmes	Low or lowered BAC levels (0.00% to 0.05%); graduated licensing for young and novice drivers; sobriety checkpoints; administrative licence suspension; comprehensive mandatory sanctions; DUI-specific courts; interlock devices	Severe punishment alone; designated driver programmes; safe ride services; education programmes; victim impact panels	Measures to increase severity of punishment alone are unlikely to change alcohol-impaired driving, but those aimed at general deterrence of drinking and driving through surveillance measures and limitations on driving (e.g. temporary licence removal) can be effective
Modifying the drinking environment (see Chapter 12)	12 (7)		Training to better manage aggression; enhanced enforcement of on-premises laws and legal requirements and proactive policing; targeted policing; legal liability of servers, managers, and owners of licensed premises; community approaches focused on specific target populations	Training and house policies relating to responsible beverage service; interventions to address drinking at sports venues and festivals; voluntary regulation or coordination	Generally evaluated in terms of how interventions affect intermediate outcomes (e.g. bar staff knowledge and behaviour) and alcohol-related problems such as drink-driving and violence, although some evaluations measure impact on consumption in specific settings
Treatment and early intervention (see Chapter 13)	7 (7)		Brief interventions for non-dependent high-risk drinkers; behavioural and psychosocial therapies; pharmacological treatment; mutual help interventions	Some types of coercive treatment	Usually evaluated in terms of days or months of abstinence, reduced intensity and volume of drinking, and improvements in health and life functioning. Target population is harmful and dependent drinkers, unless otherwise noted

[a] Although Chapter 9 indicates only a small amount of research on total marketing bans, the designation here as a Best Practice is based on the large body of research on effects of alcohol marketing, as well as evidence from tobacco marketing bans research.

[b] For further information, please see ⬛ Online Appendix 1.

intervention affected the primary outcomes, they were not given a positive rating for the purposes of this analysis. The extensiveness of the options with evidence of effectiveness (53 out of 69 options across all seven categories) shows that the policy solutions developed to deal with alcohol are not only numerous, but also extraordinarily diverse, ranging from individual therapeutic services for persons with alcohol-related problems to population-level strategies designed to influence the affordability, availability, and allure of alcohol for the general consumer. But there are also numerous options ($N = 16$), often more politically palatable because they are less threatening to vested interests, where the evidence points to a lack of effectiveness and, in some cases, even harmful effects.

From the policymaker's perspective, strategies and interventions that are high in effectiveness, supported by numerous studies, capable of reaching their target group and relatively low in cost can be considered 'Best Practices', i.e. the policy option was found to be superior to any alternatives. 'Good Practices' are options rated in Chapters 7 to 13 as less than the maximum on effectiveness and amount of research support, but which have nevertheless been found to be good investment. Other factors that contributed to our selection of Best Practices and Good Practices included feasibility in a variety of political systems and cultural settings (e.g. total prohibition of alcohol sales may not be possible without strong religious support) and the potential for causing unintended consequences (e.g. development of an illegal market of unrecorded alcohol). Finally, the table also lists 'Ineffective Practices', which are policy options that are unlikely to affect alcohol consumption or problems and, in some cases, consume resources or distract attention from more effective alternative policies.

16.2.1 The Best Practices: restrictions on affordability, availability, and accessibility, as well as marketing controls and drink-driving deterrence measures

Of all the policy areas reviewed, the one receiving the strongest research support is alcohol pricing and tax policies. This may surprise many policymakers, but the research is extensive and the findings are convincing. As described in Chapter 7, increasing alcohol taxes not only reduces alcohol consumption and related harm, but also provides revenue to the state. Another advantage of taxation and pricing strategies is that heavier as well as lighter drinkers are responsive to price changes. Even when the effect on heavier drinkers is less in terms of percentage change than that on lighter drinkers, it nevertheless has substantial implications for public health and social well-being. Given the broad reach of pricing and taxation strategies, and the relatively low expense of implementing them, the expected impact of these measures on public health is relatively high.

One potential limitation of pricing policies is that the informal or illicit market for alcohol in some countries can shift consumption to illicit beverages that are less expensive, but possibly more hazardous. However, a review (Rehm *et al.* 2021b) of the research evidence indicates that unrecorded alcohol consumption does not necessarily rise after tax increases if mitigation measures are put in place by governments. These include policies designed to bring the informal and illicit market under government

control, as well as measures to make toxic surrogates less available or less harmful (Lachenmeier *et al.* 2011; Okaru *et al.* 2019; Lachenmeier *et al.* 2021). Another factor potentially limiting the effects of tax policies is cross-border trading that occurs between neighbouring countries with large price differentials.

In addition to alcohol taxes, the evidence is strong for regulating the physical availability of alcohol. Alcohol consumption and related problems have been found to increase when alcohol becomes more accessible and convenient to use (see Chapter 8). By restricting hours and days of sale, the convenience of supermarket or cornerstore sales, and the density or concentration of retail and on-premises drinking establishments, policymakers can reduce exposure to alcohol's intoxicating and toxic effects, and thereby reduce alcohol-related problems. Another type of availability restriction employed in many countries is banning the sale or use of alcohol in particular circumstances (e.g. operating machinery), locations (e.g. parks), or population groups (e.g. young persons below a certain age). Government monopolies on alcohol production and sales provide an effective way to control availability when public health objectives are the primary rationale for the system. In the absence of a monopoly, licensing systems have been used to control availability through regulation and sanctions (e.g. licence revocation). A strategy employed in almost all nations to control youth access to alcohol is enforcement of age restrictions for the purchase of alcohol. Where age restrictions can be enforced consistently, and the legal purchase age is set later in the period of greatest risk (e.g. age 21), research in the United States and a few other countries has demonstrated significant reductions in drink-driving casualties and other alcohol-related harms among young people. The research suggests that the more youth access to alcohol can be restricted, the less the likelihood that harm will occur.

Many countries have inadvertently increased the availability of alcohol in their populations through policies encouraging the development of night-time economy in urban areas. Research shows that the density of alcohol sales outlets and drinking establishments and provisions for late-night service or sales are generally correlated with levels of alcohol-related problems, and restrictions on density and times of sale are therefore likely to be an effective antidote to intoxication, injuries, and violence because they reduce the attractiveness and convenience of heavy drinking.

Since the development of modern marketing techniques, now exacerbated by the widespread use of digital media by the **transnational alcohol corporations**[1] (TNACs), there have been very few examples of comprehensive bans on marketing, and therefore, few relevant evaluations have been conducted. Most government responses have been partial and they are unlikely to be effective, since the seller's budget for marketing will simply be transferred to a time or medium on which it is allowed. However, the large and robust research literature reviewed in Chapter 9 demonstrates that exposure to marketing has considerable implications. It increases early initiation of alcohol use, as well as riskier drinking patterns, and it reinforces social norms supporting heavier alcohol use. The weight of evidence from alcohol marketing research and evaluations of comprehensive bans on tobacco marketing suggests that a total ban on the

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[1] Key terms that have technical or linguistic meanings that would not be familiar to the general reader are identified in the glossary at the end of the book. These terms are indicated in bold when they are first used in a given chapter.

full range of marketing practices would have a modest short-term effect on drinking and, given the cumulative impact of marketing, longer-term impacts on both drinking and normalization of alcohol. Voluntary self-regulation codes, the alcohol industry's favoured alternative to statutory restrictions on marketing, have also been evaluated, but there is no evidence that they have been successful in protecting vulnerable populations from exposure to alcohol advertising or reducing rates of alcohol problems. It should be noted that the harmful effects of alcohol marketing extend beyond youth to include persons with alcohol dependence, especially those who are trying to abstain. It is likely that the effects of a marketing ban would be beneficial to these populations as well. Given the strength of evidence of the adverse public health impacts of alcohol marketing and the success of tobacco marketing bans, it is considered likely a total ban on alcohol marketing would prove to be cost-effective.

Beyond alcohol taxes, availability restrictions, and a total ban on marketing, the table shows that several drink-driving countermeasures (low blood alcohol concentration (BAC) levels, intensive breath testing) were considered Best Practices because of their combined ability to reduce alcohol-impaired driving and traffic injuries. Not only is there good research support for these programmes, but they also seem to be feasible and applicable in most countries, although they can be expensive to implement and sustain. As a general principle, drink-driving countermeasures that increase the certainty and visibility of enforcement (e.g. random breath testing), as well as the rapidity of sanctions (e.g. administrative licence suspension), are effective ways to prevent alcohol-related automobile casualties.

16.2.2 The Good Practices

In addition to the Best Practices identified in four policy areas, Table 16.1 shows an even larger number of Good Practices in all seven categories. These strategies and interventions deal with further restrictions on affordability, availability, and alcohol marketing, as well as interventions targeted at high-risk individuals and environments.

With the growing amount of research using randomized controlled research designs (see Chapter 10), there is some evidence for the effectiveness of programmes that combine alcohol education with more intensive family and community involvement. Education strategies have moderate to high cost, reflecting the expense of training and implementation. Although the reach of school-based educational programmes may indeed be excellent (because of the availability of captive audiences in schools), the population impact of these programmes in reducing harm is low.

Interventions to modify public drinking contexts (e.g. taverns and sports stadiums) have proliferated in recent years and the amount of evidence on the effects of altering the drinking context has also grown. The conclusion from this research is that strategies in this area can have modest effects. One recurring theme in this literature is the importance of enforcing limits on sales and service to prevent intoxication. But even mandatory training in **responsible beverage service** will have little effect if it is not enforced by sustained policing or by a credible threat to suspend the licences of outlets that repeatedly serve intoxicated patrons. Monitoring and enforcement as a condition of licensing have costs, although governmental costs can be defrayed by such means

as setting appropriate licence fees. Approaches focused directly on alcohol-related problems or harms, rather than on consumption, have shown similarly modest effects. Finally, sustained effects from these policies require sustained effort.

In many countries, treatment services have been the first line of response to alcohol-related problems, under the assumption that if those who develop alcohol dependence could be helped to stop or reduce drinking, there would be a significant reduction in alcohol-related problems in society. The literature reviewed in Chapter 13 finds that many alcohol treatment services have good evidence of effectiveness in terms of short-term outcomes for individual cases, but they can be expensive to implement and maintain, with the exception of mutual help organizations. At the population level, their impact is limited, relative to other policy options, since treatment for alcohol problems does not benefit all who come to treatment and only a small fraction of those whose drinking will have adverse effects on themselves or others come to treatment. Even brief interventions for non-dependent hazardous and harmful drinkers, which have good evidence of effectiveness, are restricted to those health care settings where universal screening is routinely conducted and professionals are trained to intervene. While providing treatment and brief intervention services is an obligation of a humane society, their effect on the problem rates in the population at large is limited.

16.2.3 The ineffective measures and potentially harmful policy options

The table also lists policies, often implemented for economic or political reasons, that can actually increase the affordability and accessibility of alcohol. These are considered ineffective and potentially harmful from a public health perspective. Measures that increase youth exposure to digital and traditional marketing can also contribute to the prevalence of alcohol-related problems. In addition to these potentially harmful policy changes, there are a variety of measures, often advocated by the alcohol industry as alternatives to effective policies, that have been found to be ineffective, and therefore inadequate substitutes for the Best Practices and Good Practices described in this book. Among these, industry voluntary self-regulation of marketing, industry-sponsored responsible drinking programmes, and designated driver programmes either have not been evaluated or have been shown to be ineffective.

In addition, the expected impact is low for the more traditional versions of school-based education and for public service messages about drinking. Education alone often changes knowledge, but not drinking behaviour or problems, which accounts for its low effectiveness ratings.

16.3 Enhancing the likelihood of effectiveness: the policy environment

Alcohol policies rarely operate independently or in isolation from other measures and broader societal trends. Policy measures are often moulded to existing conditions and

implemented over time in a way that is fragmented, piecemeal, and uncoordinated, in part because of the range of policy areas covered. As noted in Chapter 14, different ministries, departments, and administrative agencies each have some aspect of alcohol policy under their purview. As a result, most countries do not have a comprehensive and coordinated set of policies toward alcohol, but rather dozens of policies that are sometimes based on profoundly different assumptions about the role of alcohol in society and the nature of alcohol-related problems. To enhance the likelihood of effectiveness, alcohol policies would benefit from greater integration and coordination. But experience has shown that positive results cannot be achieved simply by calling together representatives of ministries and departments to agree on a national policy. With the different agendas of different agencies, the result can be a policy based on the least common denominator. If the aim is an effective mix of legislation and regulations implemented in the public interest, then the coordination needs to be led by an agency with public health and social well-being as its primary concern and with sufficient authority to influence the government sectors with different interests and stronger ideological power (Feiock 2013).

Rather than a disparate patchwork of single strategies implemented without any overarching rationale, the most effective approach is likely to be a complementary system of universal strategies that seeks to decrease the affordability, availability, and attractiveness of alcohol, as well as targeted policies (e.g. drink-driving countermeasures) that can reduce alcohol-related harms. Perhaps the most dramatic demonstration of the potential of the policy environment to impact public health is the study by Nemtsov *et al.* (2019) of alcohol-related mortality and life expectancy in the Russian Federation between 1980 and 2017. As shown in Figure 16.1, trends in alcohol consumption were closely mirrored by trends in life expectancy, and both were influenced by the sequential imposition of alcohol control policies—as well as by general economic conditions. The first major decline in consumption coincided with the anti-alcohol campaign in the Gorbachev era that included limits on alcohol production and availability during the mid-1980s. The second decline was associated with the severe economic hardship resulting from the economic reforms of the 1990s. The third and longest reduction involved a number of policy initiatives, beginning in 2003 with the introduction of a minimum price on vodka, followed by restrictions on marketing (2004), measures against unrecorded alcohol (2006), and a ban on internet sales (2007), as well as additional availability controls and tax increases. The −0.91 correlation between per capita alcohol consumption and life expectancy (Nemtsov *et al.* 2019) demonstrates that alcohol is indeed no ordinary commodity. In countries with very high consumption levels, dramatic improvements in longevity can be achieved through a combination of alcohol control measures.

These longitudinal findings are supported by cross-sectional studies comparing a large number of countries (Brand *et al.* 2007; Xuan *et al.* 2015; Cherpitel *et al.* 2018; Korcha *et al.* 2018). Despite the limitations of cross-sectional studies as indicators of causality, the findings suggest that alcohol policy environments that contain a variety of evidence-based measures restricting affordability, availability, and attractiveness are more likely to experience lower levels of consumption and harm.
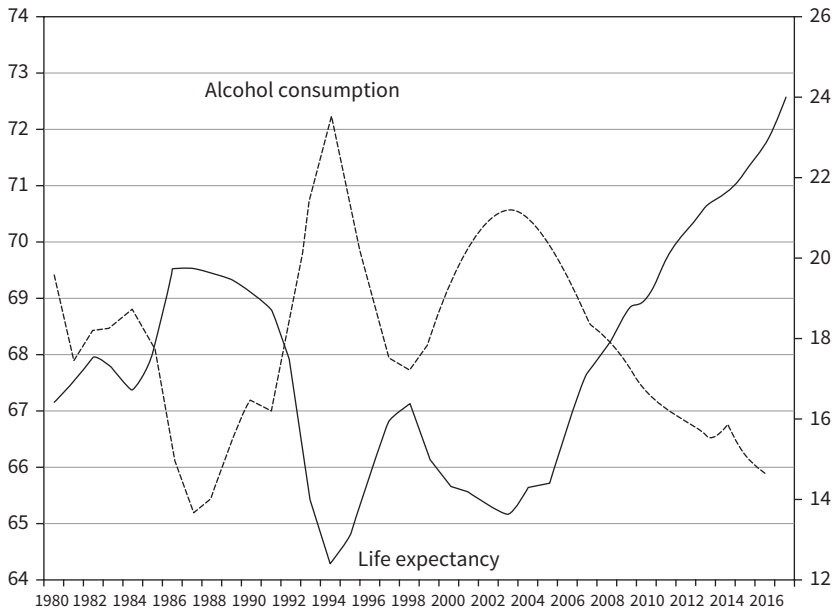
Figure 16.1 Relationship between per capita alcohol consumption and life expectancy in the Russian Federation between 1980 and 2016. Solid line = life expectancy (both sexes). Dashed line = total alcohol consumption 15+.

Reproduced with permission from Nemtsov N, Neufeld M, and Rehm J (2019) Are trends in alcohol consumption and cause-specific mortality in Russia between 1990 and 2017 the result of alcohol policy measures? *Journal of Studies on Alcohol and Drugs*, 80: 489–98.

Demonstrating that changing alcohol policies can have substantial effects on public health and social well-being is a solid beginning, but it raises the question of how policy research can inform the policymaking process. As described in Chapters 14 and 15, the process involves government and other stakeholders engaged in policy-making and policy enforcement at the local, national, and international levels. This process is often accelerated by key individuals and events that bring alcohol policy issues to public attention. The process is also influenced by the beliefs, norms, and values held by the public, policymakers and the media, and these are, in turn, affected by input from a variety of actors (e.g. professional and public interest organizations, the research community, government ministries). The process contributes to the policy mix, which will need to include population-level alcohol control strategies (e.g. price controls, availability restrictions, marketing bans), as well as education measures and harm reduction interventions focused on high-risk drinkers. In any particular society, these policies, individually and in combination, as well as the history of alcohol's position in the society, affect the extent to which alcohol drinking becomes a taken-for-granted activity in everyday life, and this will be reflected in total alcohol consumption, as well as in consumption in high-risk groups, both of which affect the extent of alcohol-related harm.

16.4 Cost and cost-effectiveness of alcohol policies: a rationale for a stronger policy environment

Effective policies can mitigate the enormous social and medical costs of alcohol consumption. Chisholm *et al.* (2018) used economic modelling procedures to estimate the cost and cost-effectiveness of five of the interventions reviewed in Chapters 7 to 13: brief psychosocial interventions, excise taxes, restrictions on alcohol marketing, limits on availability, and drink-driving laws. Costs were estimated in international dollars, and effectiveness in healthy life-years gained. Analysis was carried out for 16 low-, middle-, and high-income countries. Consistent with the summary ratings presented in Table 16.1, increasing excise taxes had a low cost and a highly favourable ratio of costs-to-effects in both low- and high-income settings. Availability and marketing restrictions were also highly cost-effective in both low- and high-income settings. Enforcement of drink-driving laws via sobriety checkpoints and delivery of brief psychosocial treatments were also cost-effective, but to a lesser extent. Some policies also have positive by-products. For example, an added benefit of alcohol taxes is that revenue raised from taxes can be earmarked to fund treatment services and prevention programmes, as well as enforcement of other alcohol policies.

16.5 Role of the alcohol industry

Chapter 5 described the growth of the alcohol industry in terms of its economic concentration in large producers, its global reach across the world's major economies, and its use of new product designs and sophisticated marketing techniques to recruit new drinkers and encourage consumers to drink more alcohol on a wider range of occasions. As noted in Chapter 14, the industry also plays an increasingly influential role in the policymaking process, promoting an approach that includes industry 'partnerships' with public health professionals, government agencies, and the scientific community. These partnerships can have a negative impact when the public good conflicts with the industry objective of increasing sales, which it seeks to do by three major strategies: (1) keeping alcohol taxation as low as possible; (2) broadening the situational acceptance of drinking; and (3) avoiding government regulation of marketing and other promotional activities. When the alcohol industry becomes the major obstacle to alcohol policy in a country, it contributes to what Rene Jahiel (1989) terms a corporate-induced disease, reflecting the industry's role in the policy process, its effect on the policy mix, and its direct and indirect impact on alcohol consumption and problem levels. Thus, the public health and welfare interest will best be served by excluding industry interests from the decision-making process on alcohol policies.

The World Health Organization (WHO) and its Member States need to exercise particular caution toward these private actors (World Health Organization 2016). Other United Nations organizations, such as the United Nations Development Programme have classified the alcohol industry as one of the 'high-risk sectors' for United Nations–business interactions (Martens and Seitz 2019). For such reasons,

a WHO Expert Committee recommended that the WHO continues its practice of non-collaboration with the various sectors of the alcohol industry, with interactions confined to contributions the alcohol industry can make to reducing alcohol-related harm in the limited context of their roles as producers, distributors, and marketers of alcohol, and not in terms of alcohol policy development or health promotion (World Health Organization, 2007, p. 48). This also implies that the WHO should encourage governments to engage in alcohol policymaking in ways that maintain complete independence from the alcohol industry.

16.6 The need to make science more accessible to policymakers

Because alcohol availability and control occur in a complex cultural, social, and political environment, policy changes should be made with caution and with a sense of experimentation to determine both positive effects and potential negative effects. The knowledge needed to address health and social problems is unlikely to reside in a single discipline or research methodology. Therefore, interdisciplinary research should play a key role, applying the methodologies of social, behavioural, and population sciences to an understanding of alcohol-related problems and their prevention.

Policymakers have neither the time nor the training to read, digest, and base their decisions upon research findings reported in the scientific literature. Thus, responsibility for translating scientific research into effective policy is distributed across a wide variety of government agencies and public interest groups. Improving the processes by which promising research findings are identified, synthesized, and communicated effectively to both policymakers and the public will enhance the likelihood of cost-effective policies being adopted.

It also needs to be recognized that there is a need for ongoing monitoring, evaluation, and research. Resources need to be provided for this in any society where alcohol is regularly used, as a basis for further action in the context of the society's particular circumstances.

Alcohol policies will, of course, always be based on more than pure science. They are likely to arise from a combination of political expediency, commercial and revenue interests, common sense, and concerns for public safety, public order, and public health. The science may show what happens if you add or weaken certain policies, but that knowledge needs to be balanced against values and political commitments. However, the fact that there are multiple considerations in policymaking should not discourage governments from paying much closer attention to ways in which scientific knowledge can be applied intelligently and effectively.

16.7 Alcohol policy and alcohol science in low- and middle-income countries

The research on which this book is based has largely been conducted in the mature alcohol markets of high-income countries, but there is now a growing literature from

low- and middle-income countries (LMICs). As noted in Chapter 4 (Figure 4.1), the burden of illness attributable to alcohol is inversely related to the national-income level (World Health Organization, 2018, p. 83), despite lower per capita alcohol consumption in lower-income countries. The same amount of pure alcohol causes 3.7 times as much harm to health, in terms of alcohol-attributable disability-adjusted life-years, in Low-income countries as it does in High-income countries (calculated from World Health Organization, 2018, pp. 57 and 83).

As described in Chapters 3 and 4, in low- and lower-middle-income countries, alcohol accounts for a considerable amount of premature death and disability, particularly from alcohol-related infectious diseases and unintentional injuries (World Health Organization 2018, p. 83), and per capita consumption is growing in the emerging economies of Asia and Africa. Relatively low levels of aggregate consumption in these areas reflect higher levels of abstention, but among drinkers in many LMICs, a pattern of heavy episodic consumption is associated with injuries and other acute alcohol problems. This places a heavy burden on the limited resources available to protect health, welfare, and public safety. As economic development occurs, alcohol consumption is likely to increase with rising incomes, increased availability, and more aggressive alcohol marketing (Rehm *et al.* 2021a). This situation presents new challenges to develop effective alcohol policies to counteract the impact of the emphasis in recent decades on free trade and market access. In accordance with this emphasis, international trade and investment agreements and financial bodies have dismantled and prevented many effective alcohol control measures. Despite the relative weaknesses in the alcohol policy research base in LMICs, the available evidence confirms that the strategies recommended by the analysis offered in this book are broadly applicable (e.g. Room *et al.* 2002, 2013; Gururaj *et al.* 2021; Medina-Mora *et al.* 2021; Morojele *et al.* 2021; Neufeld *et al.* 2021). Within this context, countries with growing economies, especially those with expanding markets for alcohol, need to develop the capacity to evaluate their own alcohol policy experiences.

16.8   Reforming the global governance of alcohol in the public health interest

Chapter 15 has shown that many policies that affect alcohol-related problems do not originate from the health domain, but rather from concerns of non-health governmental agencies such as trade, finance, law enforcement, and social welfare agencies. There is thus a need to expand the scope of international collaborative action on alcohol problems beyond the WHO. As this book has shown, a significant driver of alcohol harm is the activity of the TNACs that produce alcohol and fund its marketing via digital platforms. These are not subject to international regulation, and their globalized structures militate against regulation at the national level. National governments are not currently collaborating to provide a comprehensive response to issues such as cross-border marketing and protection of policy from industry conflicts of interest.

To the extent that alcohol is considered to be an ordinary commodity, trade and investment agreements often become obstacles to purposeful and efficient alcohol control policies. With the growing emphasis on free trade and free markets (see Chapter 15), trade and investment agreements have provided an enabling environment for countries to dismantle and prevent effective alcohol control measures, including the regulation of digital platforms. Taking into account alcohol's harm to others, as well as to the drinker (see Chapter 4), there is a strong need for negotiating an international alcohol control treaty under such auspices. Repeated calls for such a treaty have been made since the turn of the century by academics, professional organizations such as the World Medical Association, WHO commissions and technical advisory bodies, and governments of LMICs (Casswell 2019). Such a treaty would match the success of the WHO Framework Convention on Tobacco Control and would share some characteristics with it, but with additional elements that take into consideration that alcohol is a psychoactive intoxicating drug, and with provisions for control of international trade such as those in the international drug control treaties (Casswell and Thamarangsi 2009; Room and Cisneros Örnberg 2020).

16.9 Extraordinary opportunities

On the basis of the evidence arrayed in this book, extraordinary opportunities exist to strengthen the policy response to alcohol-related problems. The following considerations support this conclusion:

- *Multiple opportunities*. The 69 policy options reviewed in Chapters 7–13 and the 53 with evidence of effectiveness speak to the wide range of strategies and interventions available to the policymaker. Each of those entries deserves separate scrutiny, as we have argued earlier, but the extensiveness of the list carries its own message.
- *Opportunity to combine cost-effective strategies into an integrated overall policy*. Alcohol policy is likely to be most effective when it uses a variety of complementary population-wide strategies that discourage heavy drinking. For instance, in both Lithuania and Russia, in recent years, measures making alcohol more expensive, less readily available, and less heavily promoted have been mutually supportive and resulted in substantial reductions in levels of alcohol consumption and alcohol-related harms (Nemtsov *et al.* 2019; Neufeld *et al.* 2021).
- *Research can optimize policy effectiveness*. Research methodologies are now available to monitor alcohol's contribution to the global burden of disease, and the effectiveness of different policy responses. Rather than viewing alcohol policy interventions either as invariable solutions or as hopeful 'shots in the dark', it is now possible to use epidemiological and policy research to inform the development of alcohol policies that are mutually supportive and synergistic. We believe that it is right to ask for the science to be taken seriously. Research has the capacity to indicate which strategies are likely to succeed in their public health intentions, and which are likely to be less effective or even useless, diversionary,

and a waste of resources. Monitoring and analysis of the effects of policy changes are the best guide to how they can be improved, and financing for such research should be included as part of the policy's implementation.

- *Opportunities to strengthen public awareness and support.* The consumers of the research reported in this book should be, in part, the general public. More effort is needed to translate the scientific evidence into plain language for the media, opinion leaders, community groups, and the general population. An informed public climate can help build support for public policies on alcohol.

- *Enhancing international collaboration in the response to alcohol.* This book has taken an international perspective throughout. The research we have presented and the policy options we have described come from experience in many different countries. International trade and investment agreements and the global activities of the transnational alcohol industry make an international view of alcohol-related problems essential. There are considerable opportunities to strengthen international collaboration and the sharing of experiences in this area. The role of the WHO should be central, although the social and welfare harms from alcohol mean that it should not be the only international body involved in alcohol policy. In our view, the research findings make a strong case for strengthened WHO initiatives on alcohol and public health, including a Framework Convention on Alcohol Control. The WHO's SAFER initiative, which was launched in 2018 to promote effective strategies and interventions, is an important beginning, but it will need much more support at the country level and the addition of an international health treaty to support controls on industry practices such as cross-border alcohol marketing.

16.10 Conclusion

The difference between good and bad alcohol policy is not an abstraction, but very often a matter of life and death. This book has shown that opportunities for evidence-based alcohol policies that better serve the public good are clearer than ever before, as a result of accumulating knowledge on which strategies work best. This conclusion provides ample cause for optimism. However, this book must also be seen as carrying another well-evidenced and not so cheerful message. It provides the world community with new documentation that alcohol production, sales, and marketing are inflicting vast damage to public health and welfare on a global scale. It also shows that the policies to address these problems are too seldom informed by science, and there are still too many instances of national policy vacuums filled by unevaluated or ineffective strategies and interventions, often promoted by the global alcohol industry.

Optimism or pessimism—which is it to be? The answer to that question may depend significantly on whether the future brings increased use of evidence-based alcohol policies at both the national and international levels. That is what citizens of alcohol-using countries need to work for, but also what they have a right to expect.

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Glossary of terms

Administrative licence revocation (ALR)
: A driver's licence is revoked administratively, without the need of a judicial process, in the event of a drink-driving arrest, conviction, or, in some cases, refusal to take a blood or breath test. ALR is a US term; elsewhere, 'licence revocation' is often used for the same process.

Alcohol dependence syndrome
: Term used in psychiatric classifications, introduced in the 1970s to replace 'alcoholism'. In the 11th revision of the International Classification of Diseases (2016), the equivalent term is 'alcohol dependence', defined in terms of the presence of any two of three criteria: (1) impaired control over alcohol use; (2) alcohol use becoming an increasing priority in life; and (3) 'physical dependence', indicated by tolerance of alcohol, withdrawal symptoms from cutting down use, or drinking to avoid withdrawal. In the US-based *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition (DSM-5) (American Psychiatric Association 2013), the term was dropped, and its content included in 'alcohol use disorder' (Saunders *et al.* 2019).

Alcohol-impaired driving
: When someone operates a motor vehicle while impaired by alcohol. Often legally defined according to blood alcohol concentration. Alcohol-impaired driving is sometimes called drink-driving, driving under the influence (DUI), or driving while intoxicated (DWI), and involves operating a vehicle with a blood alcohol content (BAC) level at or above the legal limit. In some legal systems, the term is defined in terms of behavioural tests or observations by law enforcement personnel.

Alcohol intoxication
: A more or less short-term state of functional impairment in judgement and psychological and psychomotor performance induced by the presence of alcohol in the body. There is considerable cultural variation in how much impairment is considered intoxication.

Alcoholism
: Term traditionally used to identify chronic excessive drinking by individuals who are physically and psychologically dependent on alcohol. While the term remains in common use, it has not been a diagnostic term for several decades. See 'Alcohol dependence syndrome'. 'Alcoholic' remains in diagnostic use, as in 'alcoholic cirrhosis', in the separate meaning of 'alcohol- involved'.

Alcohol monopoly
: A government monopoly on manufacturing and/or retailing of some or all alcoholic beverages, such as beer, wine and spirits. It can be used as an alternative for total prohibition of alcohol. Government alcohol monopolies were created in North America, Northern Europe and India to limit health and social problems.

Alcohol per capita consumption (APC)	Total alcohol per capita consumption (APC) is the recorded plus unrecorded alcohol consumption per capita 15 years and older within a calendar year, usually expressed in litres of pure alcohol, adjusted for tourist consumption (World Health Organization 2018). Be wary—the same term is often used for a rate calculated on the total population, including those aged under 15.
Alcohol prevention programmes	Generally used to refer to prevention initiatives to increase know-ledge and awareness about alcohol in adolescents, change the adolescent's drinking beliefs, attitudes, and behaviours, and modify factors such as general social skills and self-esteem that are as-sumed to underlie adolescent drinking. The term can also be used to refer more generally to such initiatives aimed at the population at large.
Alcohol use disorder (AUD)	The *Diagnostic and Statistical Manual of Mental Disorders,* fifth edi-tion (DSM- 5) combines previously separate diagnostic categories (alcohol abuse and alcohol dependence) into one alcohol use disorder category. A person is diagnosed with AUD if he or she displays two of the 11 symptoms during a 12-month period; the subclassifications are based on the number of symptoms the pa-tient has (mild AUD = two or three symptoms; moderate AUD = four or five symptoms; and severe AUD = six or more symptoms). The International Classification of Diseases, 11th revision (ICD-11) uses a version of the same term 'Disorders due to the use of alcohol' (code 6C40), but covering a wider range of diagnoses, including harmful pattern of alcohol use, alcohol dependence, alcohol withdrawal, alcohol- induced psychotic disorders, and am-nestic disorder or dementia due to the use of alcohol.
Alcopops	Also known as premixed spirits, ready-to-drink (RTD) spirits, or designer drinks. Alcoholic beverages, often designed for a youth market, characterized by carbonation, artificial colouring, and sweetness. Can be spirits-based or based on fermented beverages. Alcohol content is approximately 5%, but some alcopops have a higher content.
Arrack	Used to describe a variety of distilled drinks made from the fer-mented product of local vegetation in many parts of the world, often variously flavoured. Palm toddy or other juices, rice, and sugarcane are chiefly used in the East Indies and India, grapes and other fruit in the Balkans, and dates and other produce in the Middle East.
Attributable fraction	In the formulation 'alcohol-attributable fraction' (AAF), the pro-portion of cases in a disease or cause of death category deemed to be caused by drinking.
Baijiu	A category of alcoholic beverages that encompasses all traditional Chinese grain spirits, most commonly distilled from sorghum, but can also be made from rice, wheat, corn, and millet. Alcohol con-tent is typically between 35% and 60% alcohol by volume.

Binge drinking	In traditional usage, a pattern of heavy drinking that occurs over an extended period of time. In the mid-twentieth century and in earlier population surveys, the term referred to a bout of heavy drinking for more than one day at a time. In US research, more recently, the term has been applied to drinking by young adults and has been defined in terms of a minimum number of alcoholic drinks (usually four or five) consumed on a single occasion, and this changed meaning may also be used elsewhere. Sometimes defined as drinking that typically results in an impairment-level BAC (e.g. ≥0.08%) for most men and women. This roughly corresponds to drinking five or more drinks for men, and four or more drinks for women, in about 2 hours.
Blood alcohol concentration/ content (BAC)	The percentage (%) of ethanol in the blood, based on the mass of alcohol per mass of blood. For instance, a BAC of 0.10 (0.10%, or one- tenth of 1%) means that there are 0.10 grams of alcohol for every decilitre (100 mL) of blood. BACs can also be derived from breath tests or transcutaneous monitors. This is sometimes expressed in different terms, e.g. as milligrams per decilitre, in which case a BAC of 0.1% is expressed as 100 mg/ dL.
Brand stretching	The process of using an existing brand name to launch products in a different product category. For example, the use of alcohol brand logos on a sweatshirt or for a zero-alcohol drink.
Brief intervention services	A short counselling session, usually no more than 10 minutes, that typically provides feedback about the results of an alcohol screening test, information about low-risk drinking guidelines, and advice about how to avoid alcohol-related problems. Brief intervention services consist of one to three sessions of counselling and education. The aim is to motivate high- risk drinkers to moderate their alcohol consumption or to reduce the risk of drinking-related harm, rather than to promote total abstinence, and to refer more serious cases to appropriate treatment.
Chibuku	Indigenous alcoholic beverage of southern Africa. Also a commercial sorghum beer based on the traditional home-made African beers.
Chicha	A fermented alcoholic beverage produced in Latin America from a variety of plants, especially corn. It is often consumed in an active state of fermentation and has a low alcohol percentage, usually from 1%–3% alcohol by volume.
Cochrane reviews	Systematic reviews and meta-analyses of the scientific literature that explore the evidence for and against the effectiveness and appropriateness of medical treatments, as well as of social and psychological interventions (see https://www.cochranelibrary.com/about/about-cochrane-reviews). These reviews are designed to facilitate the choices that doctors, patients, policymakers, and others face in health care and social and health policy decisions.
Comparative risk assessments	Comparing the effects of all major risk factors for avoidable burden of disease.

Confounding	A distortion of results that occurs when the relationship between an apparently causal variable and an outcome variable of interest actually results entirely or in part from an extraneous variable that influences both variables or their relationship (https://www.scribbr.com/methodology/confounding-variables/). Note that the weakening of the apparent relationship could alternatively reflect that the third variable is an intervening variable, located in the causal chain between the putatively causal and the outcome variables.
Contingency management	Repeatedly testing a patient to verify sobriety and giving a patient a reward or an incentive for not transgressing agreed behavioural limits; for instance, repeatedly testing a patient being treated for an alcohol use disorder and rewarding them each time the test shows that they have been abstinent.
Corporate social responsibility (CSR)	The idea that a business has a responsibility to the society that exists around it. As a business strategy, it consists of philanthropic activities and public relations campaigns designed to improve the public image of a company, or to influence political decisions in its favour.
Counter-advertising	Advertising that seeks to counter a commercial message. In the alcohol field, actions involving the use of advertising messages about the risks and negative consequences of drinking, intended to counter the effects of alcohol advertising on alcohol consumption. Such measures can take the form of print or broadcast advertisements (e.g. public service announcements), as well as product warning labels.
Cross-price elasticity of demand	A measure of the responsiveness in the quantity demanded of one alcoholic beverage when the price for another changes.
Dependence	See 'Alcohol dependence syndrome'
Digital media	Any media that are encoded in machine-readable formats. Digital media content can be created, viewed, distributed, modified, listened to, and preserved on a digital electronic device such as a smartphone or a laptop computer. Digital can be defined as any data represented with a series of digits, and media refers to a method of broadcasting or communicating information. Digital media refers to any information that is broadcast to us through a screen. This includes text, audio, video, and graphics that is transmitted over the Internet, for viewing on the Internet.
Digital platforms	A digital platform is the environment in which a piece of software is executed. It may be the hardware or the operating system, even a web browser and associated application programming interfaces, or other underlying software, as long as the programme code is executed with it. Digital platforms provide services which are of utility to their users. They include online businesses that facilitate commercial interactions between at least two different groups, with one typically being suppliers and the other consumers. Each such platform has different rules to optimize these interactions.

Disability-adjusted life years (DALYs)	A composite health summary measure that combines years of life lost to premature death with years of life lost due to disability. The disability adjustment is calculated for a particular disease in terms of a fraction of a year, reflecting the extent of disablement for each year affected by the disease.
Dram shop liability	A US term for a body of law that governs civil liability of taverns, liquor stores, and other commercial establishments that serve alcoholic beverages. For example, the server can be held liable for damage due to the drinking of alcoholic beverages served or sold before a traffic crash when a customer drives away intoxicated, if the service was illegal (for instance, the customer was underaged or already intoxicated when served). Applies in some US states by legislation or common law, mostly for commercial, rather than private, serving but is rarely used in other countries.
Drink-driving	Driving or operating a motor vehicle while impaired or while one's blood alcohol concentration is above the limit set by law. See 'Alcohol-impaired driving'.
Drinking patterns	Regularities in the frequency, amount, and type of alcohol consumed over a period of time.
Effect size	A statistical concept referring to the strength of the relationship between two variables on a numeric scale that measures the magnitude of difference between groups. The larger the effect size, the stronger the relationship between two variables.
Elasticity	See 'Price elasticity of demand'
Excise taxation, excise taxes	A legislated tax on specific goods or services at purchase such as fuel, tobacco, and alcohol. Excise taxes are distinct from general sales taxes, which may also apply for the purchase. Excise taxes are intra-national taxes imposed within a government infrastructure, rather than international taxes imposed across country borders.
Fetal alcohol spectrum disorders	A group of conditions that can occur in a person whose mother drank alcohol during pregnancy. Fetal alcohol spectrum disorders are preventable if a woman does not drink alcohol during pregnancy.
Fetal alcohol syndrome	A condition in a child that results from alcohol exposure during the mother's pregnancy. Fetal alcohol syndrome causes brain damage and growth problems. Problems caused by fetal alcohol syndrome vary from child to child, but most defects are not reversible.
Framework Convention on Tobacco Control (FCTC)	The first treaty negotiated under the auspices of the WHO. It took effect in February 2005. Provisions for Member States which have ratified the treaty include: a comprehensive ban on tobacco advertising, sponsorship, and promotion to be implemented within 5 years; strong health warnings on tobacco packaging that cover at least 30% (and ideally 50%) of the principal display areas within 3 years; protection from second-hand smoke in all indoor workplaces and public places and in public transportation; and measures to reduce smuggling of tobacco products.

Graduated driver licensing	Process by which drivers' licences are issued with limitations on driving privileges, together with loss of licence for infractions, for instance if tested BAC-positive. Primarily used for novice drivers or when a licence has previously been suspended or revoked.
Harmful drinking (called harmful (alcohol) use)	Use of alcohol that is known to have caused tissue damage or mental illness in a particular person (Edwards *et al.* 1981). In ICD-10, it is defined as a pattern of alcohol consumption that is causing mental or physical damage. Currently, the WHO uses it in two different meanings: (1) as a diagnosis in ICD-11, it refers to the individual's pattern of heavy drinking that has caused damage to the individual's physical or mental health or has resulted in behaviour leading to harm to the health of others; (2) in the context of the 2010 WHO Global Strategy to Reduce the Harmful Use of Alcohol, the concept of harmful use is defined broadly and encompasses drinking that causes detrimental health and social consequences for the drinker, the people around the drinker, and society at large, as well as the patterns of drinking that are associated with an increased risk of adverse health outcomes.
Hazardous drinking (also called hazardous (alcohol) use)	Use of alcohol that will probably lead to dysfunction (impaired psychological or social functioning) or harm (tissue damage or mental illness) (Edwards *et al.* 1981). A pattern of alcohol consumption that increases someone's risk of harm. Some would limit this definition to physical or mental health consequences (as in harmful use). Others would include social consequences. The term is currently used by the WHO to describe this pattern of alcohol consumption. It is not a diagnostic term; in ICD-11, it is included and defined (QE10) among the 'factors influencing health status'. Sometimes defined in terms of the minimum number of units of absolute alcohol likely to produce acute psychomotor impairment and/or long-term tissue damage (e.g. 20 grams of pure alcohol per drinking occasion).
Heavy episodic drinking (HED)	Drinking a relatively large amount of alcohol on some drinking occasions, whether or not also drinking smaller amounts on other occasions. Intoxication usually results from HED, although the term covers more than simply the amount of alcohol consumed. HED is a particularly marked characteristic of drinking by teenagers and young adults. Also defined as consumption of 60 or more grams of alcohol on at least one single occasion at least once per month. A more clearly defined term than 'binge drinker' or 'heavy occasional drinker'.
High-income-countries (HICs)	Countries in the highest of four categories of gross national income in the World Bank classification of countries. In 2021, this was a gross national income of $12,695 or more per capita in current US dollars (https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2020-2021).
Hours and days of sale	Days of the week and hours of the day in which it is legal to sell alcoholic beverages. Hours and days may differ between service for consumption on-premises in a tavern or restaurant, and sale by the bottle or can for consumption off-premises.

Indicated prevention	Programmes used for individuals who may or may not exhibit early signs of substance abuse but exhibit risk factors (National Institute on Drug Abuse 2003). Examples of risk factors include school failure, interpersonal problems, delinquency, and other problems.
Influencer	A person with the ability to influence potential buyers of a product or service by recommending or promoting the items, particularly on social media; a person who is able to generate interest in something (such as a consumer product) by posting about it on social media.
Licensing system	A scheme for controlling the sale and distribution of alcoholic beverages by means of licences granted by a national or local government authority to qualified persons and/or businesses. Licences vary according to type of drink (beer, wine, distilled spirits) and place of sale (on- or off-premises, tavern, bar, supermarket), with the aim of restricting sales to certain times, places, customers, age groups, etc.
Low- and middle-income countries (LMICs)	A diverse group of countries defined by the World Bank by national per capita income level; countries in the lower three categories (low, lower middle, upper middle) of a four-category scale (vs HICs). For 2021, low-income economies are defined as those with a Gross National Income (GNI) per capita of $1045 or less; lower middle-income economies are those with a GNI per capita of between $1046 and $4095; upper middle-income economies are those with a GNI per capita of between $4096 and $12,695.
Marital and family therapy	A form of psychotherapy that addresses the behaviours of all family members, as well as of the index case, and the way these behaviours affect not only individual family members, but also relationships between family members and the family unit as a whole. This branch of psychology posits that these relationships are at the core of our psychological state and therefore must be included in any meaningful psychological treatment.
Media literacy	The ability or skills to critically analyse the content created and consumed in various media in terms of its accuracy, credibility, or evidence of bias. In alcohol policy, media literacy education provides tools to help young people critically analyse alcohol advertising and other marketing messages and thereby gain greater awareness of the potential for misrepresentation and manipulation.
Mediator	An intervening or intermediate factor (e.g. intoxication) that occurs in a causal pathway from a risk factor (e.g. alcohol consumption) and a health (or social) problem (e.g. an accidental injury). It causes variation in the problem indicator, and variation within itself is caused by the risk factor. See also confounder definition. It should be noted that the same effect on the pairwise relationship can be exerted either by a mediator or a confounder, so that attention is needed to the timing and other indications of causal direction.

Meta-analysis	Statistical analyses in which data from several different studies are culled and reanalysed. The approach is particularly useful when there is a specific question to answer and at least a few relatively strong studies that come to different conclusions. A meta-analysis differs from a synthesizing review in that data from earlier studies are brought together into a new analysis, whereas a synthesizing review looks across (and may calculate summary statistics across) the reported analyses of the primary studies on which it draws.
Minimum legal drinking age (MLDA) and minimum legal purchase age (MLPA)	Legal restrictions on the age at which young people may be sold, purchase, possess, or consume alcohol in public settings. Restrictions vary widely, ranging from 13 to 25 years of age, although they are most commonly set between 16 and 18 years. In general, the terms minimum legal drinking age (MLDA) and minimum legal purchase age (MLPA) are used interchangeably, and in many jurisdictions, they are set at the same level. MLPA implies that enforcement will be focused on the sellers of alcohol, which is likely to be more effective at reducing underage access to alcohol than the consumer-level enforcement implied by MLDA restrictions.
Minimum unit pricing	A policy that prohibits the sale of alcoholic beverages to consumers below a designated price per unit of ethanol. In some countries, there are also minimum prices for specific beverages often marketed to youth and heavy drinkers. Bans on sales below cost prevent sellers from setting the price below their cost of doing business, often with the intention of attracting customers to buy other products.
Motivational enhancement therapy (MET)	A counselling approach that helps individuals resolve their ambivalence about engaging in treatment and changing their behaviour, e.g. stopping or reducing their alcohol use. This approach aims to evoke internally motivated change.
Mutual help organizations	Organizations with varying ideologies and approaches have been developed in a number of countries to provide support and advice for persons seeking to stop drinking, reduce their drinking levels, and/or recover from alcohol problems. 'Mutual help' indicates that the organization operates by group process, rather than through professional therapists. Alcoholics Anonymous is the most widely utilized such mutual help organization for persons with drinking problems. Other organizations, often guided by a permanent secretariat and with some professional involvement, but with a mutual help aspect, include Danshukai in Japan, Kreuzbund in Germany, Croix d'Or and Vie Libre in France, Abstainers Clubs in Poland, Family Clubs in Italy, and Links in Scandinavian countries.
Natural experiment	The investigation of change within, and in relation to, a context over which the researcher has no control, as when a policy change is politically determined for a jurisdiction as a whole or is implemented in one community, but not in a comparable community.
Negative externalities	A negative externality exists when the production or consumption of alcohol results in a cost to a third party. Water pollution by breweries and the noise or injuries associated with the late night economy are examples of negative externalities.

Non-communicable diseases (NCDs)	An array of conditions that are not caused by an acute infection, and therefore not transmissible directly from one person to another. They result in long-term health consequences and often create a need for long-term treatment and care. Physical health conditions covered include cancers, cardiovascular disease, cirrhosis, and diabetes. Also known as chronic diseases, they are usually the result of a combination of genetic, physiological, environmental, and behavioural factors. The WHO's Action Plan on NCDs in 2013 did not include mental disorders (including alcohol use disorders) within the category of NCDs, but NCDs have been included since 2018.
Off-premises sales and consumption	A licence for places which sell alcohol in containers to customers who purchase it and then take it somewhere else for consumption. Depending on local regulations, this may include a wide variety of establishments—not only liquor stores and wine stores, but also grocery stores, corner stores, and online ordering and home delivery services.
On-premises sales and consumption	The sale and service of alcoholic beverages for on-premises consumption. This may apply to various types of establishment, including taverns and other drinking places, defined, for instance, by such sales accounting for >50% of gross revenues. Also included in the category are restaurants which serve alcohol with meals, and clubs and other semi-public drinking places. An on-premises sales licence is typically intended to allow customers to drink within a specifically designated area where servers can monitor the process of drinking. As a condition of the licence, they are typically expected to prevent sales to minors and stop sales when someone is intoxicated.
Pattern of drinking	See 'Drinking patterns'.
Per se laws	Laws that clearly define drink-driving offences in terms of a BAC at or above a prescribed level for all drivers or young drivers.
Pigouvian tax	A tax assessed against private individuals or businesses for engaging in activities that create adverse side effects for society, especially those costs that are not included as a part of the product's market price. The aim is to make the price of the good equal to the social marginal cost and create a more socially efficient allocation of resources.
Pisco	A brandy made in South America (Chilean liquor).
Pre-drinking	See 'Pre-loading'.
Pre-loading	Consumption of alcohol, often by groups of young persons at home or in public places, before going out to pubs, clubs, and other places where alcohol can be bought only at a higher price.
Premiumization	Encouraging consumers to move toward beverages with higher price points.
Prevention paradox	The notion that the majority of alcohol-related problems in a population are not associated with drinking by alcoholics, but rather with drinking by a larger number of non-alcoholic 'social' drinkers (Kreitman 1986; Skog 1999).
Price elastic	A term in economics, meaning that the percentage change in the amount of a commodity purchased is greater than the percentage change in price. Alcoholic beverages are rarely price-elastic in the specific sense of this term.

Price elasticity of demand	The term 'elasticity' is used by economists to describe the responsiveness of one variable to changes in another variable. Price elasticity of demand measures the responsiveness of demand for alcoholic beverages to changes in price. It involves comparing the proportional changes in price with the proportional changes in the quantity demanded. The relationship is expressed in the form of a ratio, with ratios above 1 being 'elastic' and those below 1 'inelastic'.
Price-inelastic	The percentage change in price is greater than the percentage change in the amount of alcohol consumed (or quantity demanded). Note that 'inelastic' here does *not* mean that there is no effect of price on demand or sales.
Public service announcements (PSAs)	Messages prepared by health and other government agencies, non-governmental organizations, and media organizations for the purpose of providing information for the benefit of a particular audience. When applied to alcohol, they may deal with 'responsible drinking', the hazards of driving under the influence of alcohol, and related topics. See also definitions of 'Corporate social responsibility' and 'Social aspects and public relations organizations'.
Pulque	Indigenous alcoholic beverage of Mexico, now also commercialized. It is made out of juice from the maguey cactus that goes through a fermentation process (similar to that of beer).
Quasi-experimental	Lacking complete control over the scheduling of an experimental intervention that makes true experiments possible. A quasi-experimental design does not include random assignment between those receiving and those not receiving the intervention. The strength of evidence on causation of a quasi-experimental design is lower than that of a true experimental design (see 'Randomized clinical trial').
Random breath testing	Roadside checks of randomly selected drivers to assess blood alcohol level based on breath alcohol content. Also called 'compulsory breath testing' in some countries. Motorists can be stopped at random by police and required to take a preliminary breath test, even if they are in no way suspected of any offence.
Randomized clinical trial	A research design in which study participants are randomly allocated to either a group that will receive an experimental treatment or one that will receive a comparison treatment or placebo. Randomization is done to eliminate error from self-selection or other kinds of systematic bias. Also called randomized controlled trial.
Rationing	In terms of the sale of alcoholic beverages, the amount sold is limited to a certain amount per person (usually determined by government authorities). Alcohol rationing was common in many countries during both World Wars and was applied in some countries as an alternative to prohibition, but is uncommon in the twenty-first century.
Regression to the mean	A statistical phenomenon that can make natural variation in repeated data look like real change. It describes the common finding that unusually high or low measurements in a particular person or unit of analysis tend to be followed by measurements that are closer to the mean.

Relapse prevention	A skills-based, cognitive behavioural therapeutic approach that requires patients and their clinicians to identify situations that place the person at greater risk of relapse and then develop a strategy for reducing the likelihood and severity of relapse.
Responsible beverage service	Limiting the serving of alcohol for on-premises drinking, so as to avoid selling alcohol to intoxicated or underaged patrons. A responsible beverage service programme involves training servers regarding state-, community-, and establishment-level alcohol policies; describing potential consequences for failing to comply with such policies (e.g. criminal or civil liability, job loss); and development of necessary skills to comply with these policies. Training is of varying intensity and may be as little as a requirement to view a short video. The programme may also involve training for, and commitment to, standards by the establishment's management.
Responsible drinking	Drinking of alcoholic beverages in moderation; drinking that does not lead to misbehaviour and harm to the drinker or to others. The term is not defined more concretely and is much favoured by alcohol industry interests, since it points to the behaviour of the consumer, rather than their product, as the source of any harm.
Screening and brief intervention (SBI)	A valid and reliable short screen that can be administered in a variety of ways, followed by a brief intervention (as short as 3 minutes), if needed, based on the results of the screen. SBI is an approach to the delivery of early intervention and referral to treatment for people with substance use disorders and those at risk of developing these disorders.
Selective prevention	Strategies that are targeted to subpopulations identified as being at elevated risk of a disorder or harm.
Shebeens	An unlicensed establishment or private house selling alcohol. An originally Irish term used to describe a category of on-premises drinking establishments in South Africa.
Shochu	A low-priced Japanese spirit having an alcohol content of about 25%
'Sick-quitter' effect	The fact that many people abstain from alcohol because they are already sick, thereby making abstainers look less healthy as a group than moderate drinkers (Rehm *et al.* 2008).
Sobriety checkpoints	Places where roadside tests, designed to evaluate whether an individual is driving under the influence of alcohol, are administered.
Social aspects and public relations organizations (SAPROs)	Organizations funded by alcohol industry sources whose ostensible purpose is to provide information and conduct corporate social responsibility activities on behalf of the alcohol industry. Operating within the neoliberal policy framework, SAPROs seek to forestall regulation and prioritize industry profits over public health by promoting ineffective industry-friendly interventions (such as school-based education, public service announcements, or responsible drinking campaigns) and creating doubt about interventions that have a strong evidence base (such as higher taxes on alcoholic beverages).

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Social marketing	The use of commercial marketing principles and techniques to improve the welfare of people and the physical, social, and economic environment in which they live (Andreasen 1994). It is a carefully planned, long-term approach to changing human behaviour. However, corporate social responsibility activities of alcohol industry interests would rarely fit within the scope of what has been intended by advocacy for social marketing.
Social media platform	A web-based and mobile-based Internet application that allows the creation, access, and exchange of user-generated content. Social media use interactive digitally mediated technologies that facilitate the creation or sharing/exchange of information, ideas, career interests, and other forms of expression via virtual communities and networks. See also digital platform.
Social well-being	A condition in which basic human needs are met and people are able to coexist peacefully in communities with opportunities for advancement. The ability to make and maintain meaningful positive relationships and regular contact with family, friends, neighbours, and co-workers
Soju	Traditional Korean liquor distilled from rice, barley, and sweet potatoes.
Systematic review	A published review article, the purpose of which is to summarize available primary research in response to a research question. Authors attempt to identify, appraise, and synthesize all the empirical evidence that meets pre-specified eligibility criteria to answer a specific research question.
Tax pass-through to price	The extent to which the costs of a tax increase are passed through to the consumer by means of an adjustment in the purchase price.
Time-series	A sequence of data points that occur in successive order over some period of time. This can be contrasted with cross-sectional data which capture a single point in time.
Time-series analysis	Statistical procedures that allow causal or descriptive inferences to be drawn from repeated measurements made on the same individuals or collectivities over time. In one type of such analysis, different series of repeated measurements are compared and analysed over time to yield some evidence on causality by seeing how a change in one series correlates with a change in the other.

Therapeutic community (TC)	A common form of long-term residential treatment for substance use disorders, focusing on overall lifestyle changes, and not simply abstinence from drug use. The term implies that community interaction and process within the group sharing the residence have therapeutic benefit.
Transnational alcohol corporations (TNACs)	The alcohol industry is dominated by a small group of transnational companies that control more than half of the world market. Their size allows considerable resources to be devoted, directly or indirectly, to promoting the interests of the industry. They are incorporated or unincorporated enterprises operating across multiple countries, comprising parent enterprises and their foreign affiliates.
Universal prevention strategy	A term from the prevention theory, more or less equivalent to 'primary prevention', as opposed to 'secondary' and 'tertiary', i.e. aimed at everyone, rather than at identified subgroups. In the alcohol field, a universal prevention strategy is directed at the entire population, rather than at high-risk drinkers or those with alcohol use disorders. Mass media campaigns often use a universal-strategy approach.
Unrecorded alcohol	A term that refers to alcohol which is not taxed and is outside the usual system of governmental control, including home or informally produced alcohol (whether legal or illegal), smuggled alcohol, surrogate alcohol (which is alcohol not intended for human consumption), or alcohol obtained through cross-border sales.
Victim impact panel (VIP)	A programme designed to help drink-driving offenders to recognize and internalize the lasting and long-term effects of alcohol-impaired driving. Sometimes they consist of a volunteer group of victims and surviving family members who speak to audiences about life-altering consequences of impaired driving.
Warning labels	Messages printed on alcoholic beverage containers, warning drinkers about potential harms from drinking, including harmful effects of alcohol on health.
Withdrawal syndrome	Also known as discontinuation syndrome; occurs in individuals who have developed physiological dependence on alcohol or other drugs and who discontinue or reduce their use of it. The term refers to symptoms that occur when an alcohol-dependent person abruptly stops drinking.
Zero tolerance	The concept of compelling legal and judicial authorities who might otherwise exercise their discretion in making subjective judgements regarding the severity of a given drink-driving offence to impose a predetermined punishment, regardless of individual culpability or 'extenuating circumstances'. While 'zero tolerance' is a US term, many countries have adopted zero tolerance laws regarding drink-driving offences such as mandatory jail sentences.

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[a] Most definitions in this Glossary are adapted from the following sources: Keller *et al.* (1982), Babor *et al.* (1994), and Wikipedia.

Index

For the benefit of digital users, indexed terms that span two pages (e.g., 52–53) may, on occasion, appear on only one of those pages.

Tables, boxes, and figures are indicated by *t*, *b*, and *f* following the page number