



# The Prevention of Excessive Alcohol Consumption

לעתיד בריא  
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Healthy Israel

## A Message from the Director General

The purpose of the Ministry of Health is to promote the health and quality of life of the citizens of the state. The natural focus of activity is therapeutic care, although investing in the primary prevention of disease is the true strategic choice. This is not solely a theoretical notion; it is a growing reality.

In recent years, the use of alcohol has increased to disturbing proportions among the Israeli population, especially among the younger generation. If not stopped in its tracks, it threatens the health and safety of our population.

Fully appreciating the importance of health promotion and disease prevention, in 2006, the Ministry of Health began to systematically plan preventive activity, and launched the Healthy Israel 2020 initiative. Twenty professional committees worked to evaluate the disease burden, define objectives and quantitative targets for the year 2020, and develop interventional strategies founded upon the best scientific evidence. The reports of three central subcommittees: promoting physical activity, the prevention and treatment of obesity, and healthful nutrition were published in late 2011. The current volume on the prevention of excessive consumption of alcohol lays the scientific foundation for future prevention efforts.

But theoretical guidelines are not enough; it is important to turn them into an operational plan. Therefore, within the "Pillar of Fire", the work plan of the Ministry of Health for 2011, I established the promotion of public health as one of the five key goals of the ministry. In collaboration with the Israel Anti-Drug Authority, the Ministry of Health has spearheaded a national effort to reduce excessive consumption of alcoholic beverages and reduce alcohol abuse and dependency. Comprehensive legislation has already been passed in Israel's parliament, the Knesset, and various other implementation efforts are underway. The current volume promises to enhance these efforts.

I wish to thank Dr. Boaz Lev, who heads this initiative, Dr. Elliot Rosenberg for coordinating the effort, and the primary author, Dr. Tunie Dweck, for their noteworthy achievement.

Well done, and may we all see it come to fruition.

Prof. Ronni Gamzu  
Director General

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## **A Message from the Assistant Director General**

Fighting “alcoholism” is a worthy social and health aim.

The burden of calamity inflicted by excessive drinking has to be addressed and the ill effects minimized.

Alcohol is by far the most used and abused psychomimetic drug. As such, both the general public and therapists should be aware of the consequences of abuse and how to prevent them.

Alcoholism is a major public health problem. To mitigate the “disease”, proven effective technologies must be used.

Including “alcoholism” in the agenda of “Healthy Israel 2020” is an important step; it both makes a statement and also proposes an approach with which to contain a health problem which does not cease taking its toll.

The efforts of Prof.Ronni Gamzu, Prof.Itamar Grotto, Dr Elliot Rosenberg, and Dr Tunie Dweck, as well as others, are important contributions towards mapping out the problem and suggesting tools with which to fight it.

Dr. Boaz Lev

Associate Director General

## **A Message from the Director of Public Health Services**

Excessive consumption of alcohol is one of the leading preventable risk factors for morbidity and mortality, and in particular for hepatic disease and various cancers. Therefore, this issue should be considered a major public health priority.

In recent years there has been a rise in alcohol consumption among the Israeli population in general, and in young people, in particular. The phenomenon has not yet reached the epidemic proportions it has in some other countries, where alcohol consumption is a long-standing tradition.

This is just the reason that timely implementation of interventions designed to reduce such threats to public health is critical, before we have reached the “point of no return”.

Successful action to reduce excessive consumption of alcohol and its accompanying negative health effects requires inter-sectoral cooperation, as the interventions span a broad range of areas including health education and promotion, legislation and enforcement, and the development and utilization of economic levers such as price regulation and taxation.

In this context, this report on “The Prevention of Excessive Alcohol Consumption” is a fine addition to the “Healthy Israel 2020” initiative of the Ministry of Health, which is founded upon multi-disciplinary collaborative effort both within the health system as well as beyond its borders. Publication of this report supports the “Pillars of Fire” strategy of the Ministry of Health to promote public health, and will be a useful addition to current health policy initiatives to curb excess alcohol consumption.

Several of the interventions detailed in the report, are already in their implementation phase. As such, we are currently “engaging the alcohol threat head-on”. I am certain that together with our partners we will succeed in realizing most of the recommendations detailed herein.

At this time, I would like to thank the Director General of the Ministry, Professor Ronni Gamzu, for his efforts in promoting the legislative agenda, Dr. Boaz Lev for his continued leadership of the “Healthy Israel 2020” initiative, and Drs. Elliot Rosenberg and Tunie Dweck for their day to day efforts as well as for their authorship of this important report.

Prof. Itamar Grotto  
Director, Public Health Services

## Slaking our thirst with knowledge

The Healthy Israel 2020 initiative serves as Israel's blueprint for health promotion and prevention. Under the leadership of the Associate Director General of the Ministry of Health, Dr. Boaz Lev, it has laid the foundations for systematic, evidence-based, preventive health policy since its inception in 2005.

After a capacity-building period, reports from the various committees and subcommittees were generated. In November 2011, a triple volume containing reports on the Enhancement of Physical Activity, the Prevention and Treatment of Obesity, and Healthful Nutrition were published. They were very well received on both a national and international level, and now serve as guideposts for an ambitious implementation program entitled, the National Program for a Healthy and Active Lifestyle.

The current report, The Prevention of Alcohol Consumption, addresses a growing challenge to the health of Israelis. Following the successful format of its predecessors, it contains four headings: the epidemiology of alcohol-consumption patterns by subgroup, as well as their health and economic sequelae, year 2020 health objectives and targets, year 2020 developmental data and interventional research objectives, and recommended interventions, each supported by systematic reviews of the scientific literature and assessed for their relevance to Israel.

The penultimate draft of the report has already served as the basis for a multi-organizational workshop led by the Ministry of Health and the Israel Anti-Drug Authority, where implementation and future research strategies were hammered out by key policymakers, academics, and clinical preventive, as well as public health specialists in the field. This final draft will no doubt assist in advancing further implementation efforts.

I wish to thank the Director General, Prof. Ronni Gamzu, the Healthy Israel 2020 Directorate – headed by Dr. Boaz Lev and including Prof. Itamar Grotto, Dr. Tuvia Horev, and Miri Cohen, Prof. Tami Shohat-head of the Healthy Israel 2020 Health Behaviors Committee, Prof. Yehuda Neumark, alcohol epidemiologist at the Braun School of Public Health of the Hebrew University, and the primary author of this report, Dr. Tunie Dweck of the Healthy Israel 2020 initiative, for a job well done.

Dr. Elliot Rosenberg

National Coordinator and Senior Editor

Healthy Israel 2020 Initiative

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## 1. Executive summary

### 1.1 Terminology

**Heavy (risky) drinking:** defined as consumption of more than 2 drinks per day on average for men and consumption of more than 1 drink per day for women (often stated as 15 or more drinks per week for men and 8 drinks or more per week for women).

**Binge drinking:** Defined as a pattern of alcohol consumption that brings the blood alcohol concentration (BAC) level to 0.08% or above. This pattern of drinking usually corresponds to 5 or more drinks on a single occasion for men or 4 or more drinks on a single occasion for women, generally within about 2 hours.

**Alcohol abuse and dependence:** a state where one experiences repeated negative physical, psychological, and social effects from alcohol.

The BAC is the concentration of alcohol in a person's blood. It is often used as a legal measure of intoxication. This rate can vary as a result of many factors such as a person's weight, gender, metabolic rate, the amount of food in the stomach and small intestine, and how long the person has been drinking. On average, a person will metabolize one unit of alcohol per hour, and each unit will increase the BAC by 0.02% for men and up to 0.03% for women. BAC limits vary by country, ranging from 0 to 0.08% in the vast majority of countries. The BAC in Israel is 0.05%, similar to that defined by many other countries. Recent legislation has imposed a more stringent BAC of 0.01% for drivers under age 24, drivers of public vehicles, and commercial drivers.

### 1.2 Epidemiology

#### 1.2.1 Overview

Light to moderate alcohol consumption has been associated with cardiovascular health benefits, but excessive drinking leads to a wide range of medical conditions and is a significant cause of morbidity and mortality.

Alcohol consumption can cause chronic health problems including liver disease, cardiovascular disease, pancreatitis, and malnutrition. It can also increase the risk of psychiatric disorders such as depression, anxiety disorder, and is associated with antisocial personality disorder. It increases the risk of cancers of the mouth, throat, esophagus, liver, stomach, colon, rectum, and breast. It has also been shown to increase the risk of developing infectious diseases.

In addition to its medical effects, excessive alcohol consumption also increases the risk for injury. Alcohol is a significant factor in deaths and injuries from motor vehicle accidents, fires, drowning, marital violence, child abuse, homicide, and suicide. In addition, alcohol is associated with high-risk sexual behaviors.

#### 1.2.2 Drinking patterns

In 2009, the average annual per capita consumption of alcohol in member states of the Organization for Economic Cooperation and Development (OECD) was 9.3 liters. Israel, with only 2.5 liters per capita, had the second lowest consumption after Turkey (1.5 liters per capita). The lifetime prevalence of alcohol abuse in Israel is 4%, a rate similar to that in other European countries.

There has been a mixed trend over the past decade or so regarding alcohol use among Israeli youth. Whereas 2001/2 through 2009/10 Health Behavior in School-aged Children (HBSC) survey data on weekly or more frequent consumption has exhibited a decline (except in 14 year-old boys), a comparison of the data in 11 year-olds from 2001/2 with that of 2005/6 showed increases in the percentage of those who have been drunk two or more times.

Further analysis of the 2009/10 HBSC survey showed that while a greater percentage of Arab (20.8%) vs. Jewish (16.4%) boys engaged in binge drinking, the reverse was true of girls (7.5% of Jews vs. 6.3% of Arabs).

### 1.2.3 Health and economic burden of disease

A. International data: The WHO ranks alcohol as one of the top ten causes of Disability Adjusted Life Years (DALYs). According to a recent study estimating the global burden of disease, injury, and economic costs attributable to alcohol, 3.8% of all global deaths (6.2% of deaths in men and 1.1% in women) and 4.5% of global DALYs (7.4% of DALYs in men and 1.4% in women) were attributable to alcohol. The U.S. Centers for Disease Control and Prevention (CDC) ranks alcohol as the third leading cause of preventable deaths in the U.S., with alcohol responsible for approximately 80,000 deaths per year.

The costs associated with alcohol amount to 1.3-3.3% of the Gross Domestic Product in high and middle income countries.

B. Israeli data: In 2008, there were 483 motor vehicle accidents (MVAs) where the driver was determined to be under the influence of alcohol and/or other drugs. Of these, 76 were categorized as severe MVA's (i.e., resulting in death or severe injury), while 407 were determined to be light MVA's (i.e., anything less than the above).

The percentage of offenders who were drinking at the time they committed a crime is unknown. This is also the case regarding the burden of chronic diseases due to alcohol.

## 1.3 Year 2020 Objectives

### 1.3.1 Regular objectives

**Note:** *italicization* of interventions indicates that significant challenges to successful implementation are expected.

1. Reduce the percentage of youth who consume alcohol once-weekly by 10%.
2. Reduce the percentage of adolescents who engage in binge drinking by 10%.
3. Reduce the percentage of adults who engage in heavy drinking by 10%.
4. Reduce the percentage of youth who engage in heavy drinking by 10%.
5. Reduce the average per capita annual alcohol consumption by 10%.
6. Reduce the number of serious and fatal injuries caused by alcohol and drug related MVA's by 5%.

### 1.3.2 Developmental data objectives<sup>a</sup>

1. Determine the percentage of adults who engage in binge drinking.
2. Determine the rates of pregnant women who drink alcohol.
3. Determine the rates of Fetal Alcohol Syndrome (FAS).
4. Determine the percentage of offenders who were drinking at the time of committing a crime, for all major categories of crime.
5. Collect appropriate body fluids from involved drivers to detect alcohol impairment in all MVA fatalities.
6. Determine the rates of cirrhosis and the percentage of those that are alcohol-related.
7. Determine the burden of disease attributable to alcohol consumption.

## 1.4 Interventions

### 1.4.1 Interventions directed at the population at large<sup>b</sup>

1. Increasing taxes on alcoholic beverages to prevent excessive consumption of alcohol.\*\*
2. Screening for alcohol misuse in the clinical setting and counseling to reduce the phenomenon.\*
3. Electronic screening and brief interventions (e-SBI) in the healthcare setting, university, and the community.
4. Regulation of alcoholic beverage outlet density to prevent excessive use of alcohol.
5. *Dram shop liability (holding proprietors responsible for accidents/violence caused by serving intoxicated individuals).*

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a Developmental data objectives include those objectives for which baseline data is currently absent.

b Interventions already fully implemented are marked with two asterisks (\*\*). Those partially implemented are marked with one asterisk (\*).

6. De-privatization of retail alcohol sales to decrease the sale and excess consumption of alcohol.
7. Utilization and publicity of sobriety checkpoints to reduce the incidence of motor vehicle crashes.\*\*
8. Development and fielding of mass media campaigns to reduce alcohol-impaired driving.\*
9. Promotion of ignition interlocks for those convicted of alcohol-impaired driving so as to reduce its incidence.\*
10. Development and fielding of multi-component interventions with community mobilization to reduce the incidence of alcohol-impaired driving.

#### **1.4.2 Interventions directed at underage drinkers**

1. Enhance enforcement of laws prohibiting sales of alcohol to minors.\*
2. Establishing a lower BAC for young or inexperienced drivers.\*\*
3. *Raising the minimum legal drinking age to 21.*
4. Development and fielding of school-based programs to reduce drinking and driving, as well as riding with drivers under the influence of alcohol.\*
5. Development and fielding of family-based prevention programs to prevent alcohol misuse.

#### **1.5 Developmental interventional objectives<sup>c</sup>**

1. Assess the effectiveness of police patrol programs to reduce the adverse consequences of alcohol-impaired driving.
2. Assess the effectiveness of designated driver programs to reduce the incidence of alcohol-related motor vehicle accidents.
3. Assess the effectiveness of administrative per se laws (immediate license suspension) and pre-conviction driver's license suspension policies as forms of sanctions against drunk drivers to reduce the incidence of alcohol-impaired driving.
4. Assess the effectiveness of alcohol server setting interventions in reducing the incidence of alcohol-impaired driving.
5. Assess the effectiveness of imposing limits on days and hours during which alcohol is sold as a means of reducing the incidence of alcohol-related accidents.
6. Assess the effectiveness of linking the price of alcoholic beverages to their alcohol content as a means of reducing the incidence of alcohol-related accidents.

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c Developmental interventional objectives are those objectives designed to test existing interventions that have not been adequately assessed in the Israeli context (e.g., those developed abroad) or to develop new interventions where none yet exist.

## 2. Introduction

Alcohol consumption may have salutary effects on health, or may be so detrimental as to cause premature death. Most individuals who drink, do so without developing problems. Moreover, light to moderate alcohol consumption in middle aged or older adults has been associated with health benefits such as decreased risk of heart attack, ischemic stroke, peripheral vascular disease, sudden cardiac death, and death from all cardiovascular causes,<sup>1</sup> diabetes,<sup>2</sup> and gallstones.<sup>3, 4</sup>

Alcohol-related harm is caused by excessive drinking. Alcoholic beverage consumption can cause harm via three different mechanisms: intoxication, dependence, and toxicity. Intoxication can cause immediate harm, particularly injuries and other harms associated with an elevated blood alcohol level. Dependence and toxicity can lead to additional long-term harms, such as cumulative damage to family or work life or social position, or chronic damage to health. There is also a strong co-occurrence of alcohol use with tobacco and other drug use, especially among young people.<sup>5</sup>

Excessive alcohol consumption is associated with a wide range of medical conditions and is a significant cause of morbidity and mortality. Alcohol consumption can cause long term health problems including liver disease (cirrhosis, fatty liver, and exacerbation of Hepatitis C), infectious disease (tuberculosis, pneumonia, and HIV), cardiovascular disease (arrhythmias, cardiomyopathy, and stroke) and pancreatitis. It can also increase the risk of psychiatric disorders such as depression and anxiety disorder, and is associated with the prevalence of an antisocial personality, as well as with the risk of cancers of the mouth, pharynx, larynx, esophagus, liver, stomach, colon, rectum and breast.<sup>6</sup> Alcohol addiction can also lead to malnutrition because it alters the digestion and metabolism of many nutrients. Alcohol is a teratogen: in pregnant women, excessive alcohol consumption may result in a developmental disorder called fetal alcohol syndrome (FAS) which causes craniofacial abnormalities, growth retardation, and nervous system impairment.

In addition to its medical sequelae, excessive alcohol consumption also increases the risk for injury. Alcohol is a significant cause of deaths and injuries from motor vehicle crashes, fires, drowning, marital violence, child abuse, homicide, and suicide. In addition, alcohol is associated with high risk sexual behaviors. Even a relatively small amount of alcohol consumed before operating a vehicle or machine could contribute to death and injury from motor-vehicle and occupational accidents.<sup>7</sup>

Excessive use of alcohol is a serious public health problem; it places a substantial health, economic, and social burden on society. Hence, the overall aim of alcohol policies is to prevent harmful levels of consumption, thus limiting the deleterious effects of such behavior.

## 3. Definitions

### 3.1 Heavy (risky) drinking

The U.S. National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines heavy drinking as consumption of more than 2 drinks per day on average for males, and consumption of more than 1 drink per day for females.<sup>8</sup> Fifteen or more drinks per week in males and eight or more drinks per week in females is an equivalent measure.

### 3.2 Binge drinking

The NIAAA defines binge drinking as a pattern of alcohol consumption that brings the blood alcohol concentration (BAC) level to 0.08% or above. This pattern of drinking usually corresponds to consumption of five or more drinks on a single occasion for men or four or more drinks on a single occasion for women, generally within about 2 hours.<sup>9</sup>

### 3.3 Harmful drinking

Drinking to the extent that one experiences physical, social, or psychological harm from alcohol use, without meeting the criteria for dependence.<sup>10</sup>

### 3.4 Alcohol abuse and dependence

A state where one experiences repeated negative physical, psychological, and social effects from alcohol.<sup>10</sup> These are separately defined below.

#### 3.4.1 Alcohol abuse

Maladaptive alcohol use causing clinically important distress or impairment, which manifest in a single 12-month period by *one or more* of the following:

- Failure to carry out major obligations at work, home, or school
- Repeated use of alcohol even when it is physically dangerous to do so
- Recurrent legal problems
- Continued alcohol use despite awareness that it has caused or worsened social or interpersonal problems<sup>10</sup>

### 3.4.2 Alcohol dependence

Maladaptive alcohol use causing clinically important distress or impairment, which manifest in a single 12-month period by three or more of the following:

- Tolerance or withdrawal symptoms
- Drinking an amount or for a duration greater than intended
- Unsuccessful efforts to control or reduce use
- Spending extended time using alcohol, recovering from its effects, or trying to obtain it
- Reducing or abandoning important work, social, or leisure activities because of alcohol use
- Continued alcohol use despite knowing that it has probably caused ongoing physical or psychological problems<sup>10</sup>

**Note:** The term “adults” in this report refers to those aged 21 and over, unless explicitly stated otherwise. This is a function of the fact that a large percentage of 18-20 year-olds in Israel are serving their mandatory stint as soldiers in the Israel Defense Forces during this period in their lives and hence have not typically been available to participate in the population-based epidemiologic surveys (but rather in internal Israel Defense Forces studies) used to generate the baseline data used in the year 2020 objectives.

### 3.5 Maximum legal BAC (blood alcohol concentration)

The BAC (blood alcohol concentration) is the concentration of alcohol in a person’s blood and is often used as a legal measure of intoxication. On average, one unit of alcohol is metabolized per hour; each unit typically increases the BAC by 0.02% in men, and up to 0.03% in women. This rate is influenced by a variety of individual factors such as body weight, gender, metabolic rate, the amount and type of food in the upper gastrointestinal tract, and the duration of the drinking. The rate of ethanol absorption is increased in the absence of proteins, fats, and carbohydrates in the gastrointestinal tract, at concentrations of ethanol of about 20 percent by volume, and by carbonation. Behavioral, psychomotor and cognitive changes are seen at levels as low as 0.02-0.03% (i.e., after consumption of one to two drinks). The state of intoxication, or drunkenness, affects the brain and causes delayed reflexes, slurred speech, and clumsiness. Death may occur at levels between 300-400 mg/dL. A blood-alcohol content of 0.45% represents the LD50, or the amount which would prove fatal in 50% of test subjects.<sup>11</sup>

Different countries use different limits of BAC for driving, ranging from zero to a lack of a limit. Israel’s BAC is 0.05% for the general population, but 0.01% for drivers under 24, drivers of public transportation vehicles, or commercial drivers of vehicles whose licensed weight is over 3500 kg. Many other countries have set a BAC limit of 0.05%. These include Australia, Austria, Belgium, Bulgaria, Croatia, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Portugal, South Africa, Spain, and Turkey.<sup>12</sup> Other countries have set their limit even lower, at 0.02%. These include China, Norway, Poland, and Sweden. There exist even more stringent countries where the legal limit is zero: Armenia, Azerbaijan, the Czech Republic, Hungary, Jordan, Kyrgyzstan, Romania, and the Slovak Republic. In addition, five other countries have set the limit at zero due to religious reasons: Bahrain, Mali, Pakistan, Saudi Arabia, and the UAE. At the other extreme are countries such as the United States, Ireland, Luxembourg, and England which have set the limit set as high as 0.08%.<sup>13</sup>

## 4. Epidemiology

### 4.1 International

#### 4.1.1 Drinking patterns

The definitions of heavy drinking and binge drinking vary from country to country.

In the U.S., using the above-stated definitions, 4.9% of the population were considered heavy drinkers<sup>14</sup> and 15.1% engaged in binge drinking in 2010.<sup>15</sup> Among high school students, 24% engaged in binge drinking.<sup>16</sup> The prevalence of lifetime and 12-month alcohol abuse was 17.8% and 4.7%, and the prevalence of lifetime and 12-month alcohol dependence was 12.5% and 3.8%, respectively. It is estimated that about 17% of men and 8% of women will meet the criteria for alcohol dependence at some point in their lives.<sup>17</sup>

In Canada, two guidelines exist, one for chronic effects (e.g., liver disease or certain cancers), and the other for acute drinking effects (e.g., injuries or overdoses). The definitions of low risk drinking in each of these guidelines roughly parallel the definitions of heavy and binge drinking in the U.S. Low risk drinking in the chronic-effects guideline is defined for women as drinking no more than 10 drinks per week and no more than 2 drinks per day on most days, and for men as drinking no more than 15 drinks per week and no more than 3 drinks per day on most days. Low risk drinking in the acute guideline is defined for women as drinking no more than 3 drinks on any single occasion and as drinking no more than 4 drinks on any single occasion for men.<sup>18</sup>

In 2011, 18.7% of the total population exceeded the guideline for chronic effects (“heavy drinking”) and 13.1% exceeded the guideline for acute effects (“binge drinking”). Significantly more males than females drank in patterns that exceeded both guidelines: 22.3% of male drinkers and 15% of female drinkers exceeded the chronic risk guideline, while 16.6% of male drinkers and 9.5% of female drinkers exceeded the acute risk guideline.<sup>19</sup>

In Australia, the National Health and Medical Research Council (NHRMC) published new guidelines in 2009 for reducing health risks associated with alcohol consumption. These new guidelines are based on the concept of a progressively increasing risk of harm with the amount of alcohol consumed, rather than specifying levels of ‘low risk’, ‘risky’ or ‘high risk’ alcohol consumption as used in earlier guidelines. The 2009 guidelines do not define a “safe” level of drinking. Two universal guidelines were developed for healthy adults, one for children and young people, and one for pregnant or breastfeeding women.

The first guideline advises healthy men and women to limit themselves to two standard drinks on any day, to avoid increasing their lifetime risk of harm from alcohol-related disease or injury. The second guideline advises healthy men and women to limit themselves to no more than four standard drinks on a single occasion, to avoid increasing their risk of alcohol-related injury arising from that occasion. For children and young people under age 18, avoiding alcohol altogether is the safest option. The same recommendation was made for women who are pregnant or planning a pregnancy, and for breastfeeding women.<sup>20</sup>

During the 2007-08 period, 20.9% of all individuals aged 18 years or over in Australia consumed alcohol at levels exceeding the lifetime risk guidelines (more than two standard drinks, for both males and females). In 2007-08, 38.2%, of all people aged 18 years or over either consumed more than 6 standard drinks

(males), or more than 4 standard drinks (females) on any one occasion. Note: It was not possible to estimate the proportion of persons who exceeded the 2009 NHMRC guidelines for single occasion risk, as the criterion used in the survey for males (6 standard drinks per single occasion) was much more liberal than the 4 standard drinks adopted in the 2009 guidelines.<sup>21</sup> Data from the 2007 National Survey of Mental Health and Wellbeing in Australia indicated that the prevalence of life-time and 12 month disorders was 18.3% and 2.9% for alcohol abuse, and 3.9% and 1.4% for alcohol dependence, respectively.<sup>22</sup>

In the U.K., the government recommends that men limit themselves to no more than 3-4 units of alcohol per day, and women not exceed 2-3 units per day. This is roughly similar to the binge drinking category seen in other countries. The recommended alcohol consumption per week calls for women and men to drink no more than 14 and 21 units in an average week, respectively.<sup>23</sup> In 2009, 37% of men drank over 4 units and 29% of women drank more than 3 units on at least one day in the week prior to the survey interview. 20% of men reported drinking over 8 units and 13% of women reported drinking over 6 units on at least one day in the week prior to interview. 26% of men reported drinking more than 21 units in an average week and 18% of women reported drinking more than 14 units in an average week.<sup>24</sup>

#### 4.1.2 Burden of Disease

The World Health Organization ranks alcohol as one of the top ten causes of Disability Adjusted Life Years (DALYs).<sup>25</sup> According to a 2009 study estimating the global burden of disease and injury and the economic cost attributable to alcohol, 3.8% of all global deaths (6.2% of the deaths in men and 1.1% in women) and 4.5% of global DALYs (7.4% of the DALYs in men and 1.4% in women) were considered attributable to alcohol.<sup>26</sup> The U.S. Centers for Disease Control and Prevention (CDC) ranked alcohol as the third leading cause of preventable death in the U.S., with alcohol causing approximately 80,000 deaths a year. In the U.S., excessive alcohol use is responsible for an average of about 30 years of potential life lost for each death which is approximately 2.3 million years of potential life lost (YPLL) annually.<sup>27</sup> The leading chronic cause of alcohol attributable deaths (AADs) was alcoholic liver disease (15,183),<sup>28</sup> and the leading acute cause of AADs was injury from motor-vehicle crashes (10,228).<sup>29</sup> According to the CDC, alcohol is a factor in approximately one third of both suicides and of homicides in the U.S.<sup>30</sup> Fetal Alcohol Syndrome is the leading cause of preventable mental retardation in the U.S.<sup>31</sup>

## 4.2 Israel

### 4.2.1 Drinking patterns

#### 4.2.1.1 Adults

##### 4.2.1.1.1 Alcohol consumption in liters per capita

The Organization for Economic Cooperation and Development (OECD) generates statistics regarding country-specific alcohol consumption for different countries. According to their data, during 2009, Israelis consumed 2.5 liters of alcohol per capita. This is lower than all the other 34 OECD member countries with the exception of Turkey, whose citizens consumed 1.5 liters per capita. Per capita annual consumption in the other member countries ranged from 5.9 liters (Mexico) to 12.3 liters (France).<sup>32</sup>

##### 4.2.1.1.2 General alcohol use

According to the Seventh National Epidemiological Survey, conducted by the Israel Anti-Drug Authority in 2009, using a sample of 4,657 subjects from 250 statistical areas drawn from among adults aged 18-40, 64.3% of the respondents reported drinking an alcoholic beverage of some kind in the past year. This number was similar to that noted in previous surveys. About 25% reported getting drunk at least once during the past year, and about 21% met the criteria for classification as binge drinkers, having consumed five drinks or more within several hours, at least once during the last month.<sup>33</sup>

According to a national population-based survey of Israeli adults conducted in 2003/4, 65.7% of men and 38.9% of women consumed some alcohol in the past year. This rate decreased with increasing age, dropping from 56.3% among 21-44 year olds to only 28.8% among those 75+.<sup>34</sup>

##### 4.2.1.1.3 Alcohol abuse

The lifetime prevalence of alcohol abuse in Israel is identical to the overall rate in other European countries: approximately 4%.<sup>34,35</sup> The study found higher rates of alcohol abuse among males, younger adults, immigrants from the former Soviet Union, and among those who were never married.

##### 4.2.1.1.4 Heavy drinking

A national population-based survey of Israeli adults was conducted in 2003-4. Frequent heavy drinking was defined drinking 3 or more drinks, three or more times a week, at least once during the past year. The survey indentified relatively low rates of frequent heavy drinking: 6.8% of men and less than 1% of women. As expected, young adults were more likely to report frequent heavy drinking: 4.6% of 21-44 year-olds, but less than 2% of those aged 45 and older<sup>34</sup>.

More recent (2009/10) data for all adults (aged 21 and over) are presented in Table 1.

**Table 1: Adults aged 21 and older who report being heavy drinkers, 2009/2010**

Gender	N	%
Women	1,487	0.7
Men	1,490	1.3

Source: Israeli National Health Interview Survey (INHIS), 2009/2010

## 4.2.1.2 Youth

### 4.2.1.2.1 General consumption behavior

The seventh national epidemiological survey was fielded by the Israel Anti-Drug Authority in 2009; 7,700 students aged 12-18 from 175 different schools responded. Approximately 50% reported that they drank an alcoholic beverage of some kind in the past year. This number was similar to those noted in the previous two surveys conducted in 2005 and 2001, but slightly lower than those seen in previous surveys (1989, 1995, and 1998). In addition, approximately 30% became intoxicated at least once during the past year, and approximately 25% consumed 5 drinks or more within a few hours (binge drinking) at least once during the last month. This is higher than the 25% experiencing at least one bout of intoxication and also higher than the 19% who binge drank reported in the previous survey. It is also higher than similar statistics reported above for adults (subchapter 4.2.1.1.2). The current survey shows evidence of a large increase in the prevalence of drinking with increasing age, rising from 30% in seventh grade students to 60.5% in twelfth-graders. Risk factors for drinking included youth who defined themselves as secular (61.3% vs. 32.7% in the religious), victims of terrorism (58.5% vs. 49.2 in others), children of divorced parents (58.2% vs. 48.4% in those with married parents), children with better-educated fathers (61.3% vs. 39.2% with fathers possessing 8 years of education or less), and children of employed fathers (51.6% vs. 38.3% of those unemployed).<sup>33</sup>

Table 2 presents the drinking habits of youth as noted in 2009/10 from the Health Behavior in School-aged Children survey (HBSC), a cross-national survey conducted in collaboration with the WHO Regional Office for Europe. Broadly speaking, a greater percentage of Jewish adolescents drink relative to Arabs, and drinking is more prevalent among boys vs. girls. Both trends increase with age.

**Table 2: Percentage of youth by age, gender and ethnic group who never drink alcohol, 2009/10**

Age (years)	Jews			Arabs			All		
	Boys (%)	Girls (%)	Total (%)	Boys (%)	Girls (%)	Total (%)	Boys (%)	Girls (%)	Total (%)
11	80.6	93.0	86.8	80.7	97.0	88.9	80.6	94.1	87.4
13	60.8	83.1	72.0	84.7	94.3	89.5	67.1	86.1	76.6
15	35.9	54.5	45.2	76.1	97.5	86.8	46.6	66.2	56.4
<b>Total (%)</b>	<b>59.1</b>	<b>76.9</b>	<b>68.0</b>	<b>80.5</b>	<b>96.3</b>	<b>88.4</b>	<b>64.8</b>	<b>82.1</b>	<b>73.5</b>

Source: Health Behavior in School-aged Children (HBSC) study: international report from the 2009/2010 survey with Israeli data from Y. Harel, Personal Communication, 2011.

Table 3 shows the percentage of youth who drank alcohol in Israel on at least a monthly basis. This statistic decreased by more than 15% overall from 1998 to 2006. However, this trend better characterized Arab (18.2% to 9.9%) rather than Jewish youth (29.2% to 27.5%).

**Table 3: Youth consuming alcoholic beverages at least monthly, 1998-2006**

Population	1998			2002			2006		
	Boys (%)	Girls (%)	Total (%)	Boys (%)	Girls (%)	Total (%)	Boys (%)	Girls (%)	Total (%)
<b>Jews</b>	38.7	19.9	29.2	34.6	20.9	27.3	37.4	20.1	27.5
<b>Arabs</b>	28.6	8.9	18.2	27.1	6.5	15.7	17.1	4.5	9.9
<b>Total</b>	38	18.6	28.1	33.2	18	25.1	32.6	16.6	23.5

Source: Health Behavior in School-aged Children study (HBSC). Y. Harel, Personal Communication, March, 2009.

Table 4 presents the 2009/10 HBSC survey data comparing the rates of those drinking at least once-weekly in Israel with that in 37 other countries. It is disturbing that in both 11-year old boys and girls, the percent of Israeli youth was considerably higher than the HBSC average, with Israeli boys ranking 3<sup>rd</sup> and girls 4<sup>th</sup>. Among 13 year olds, Israeli youth was still above average, but by age 15, while still relatively high (14/38) among the boys, the relative prevalence among girls was considerably lower, dropping them to the 30<sup>th</sup> position.<sup>36</sup> Additional data on this topic from the 2001/2 and 2005/6 HBSC surveys can be found in tables A2-1 and A2-2 in the Appendix. In comparing trends in three studies from 2001-2009 it is evident that rates have generally dropped in both genders and at all ages, with the exception of 15 year-old boys, in whom those drinking at least once weekly has risen approximately 15% over eight years.

**Table 4: Youth consuming alcoholic beverages at least once weekly, 2009/2010**

Age (years)	All Boys (%)	Jews (%)	Arabs (%)	HBSC Multi-country Int'l Avg. (%)	Rank	All Girls (%)	Jews (%)	Arabs (%)	HBSC Multi-country Int'l Avg. (%)	Rank
11	17.7	12.2	27.9	5	3rd	5.5	5.3	6.0	2	4th
13	17.2	15.3	21.4	10	7th	8.8	9.3	7.7	6	9th
15	28.1	29.4	24.0	25	14th	10.6	12.1	7.5	17	30th

Source: Health Behavior in School-aged Children (HBSC) study: international report from the 2009/2010 survey with Israeli data from Y. Harel, Personal Communication, 2011 and international data from HBSC website.

Table 5 shows 2009/2010 data relating to one measure of drinking severity: the percentage of those who report ever having been drunk. It is sobering to note that over forty percent of Jewish 15 year-old boys report having been drunk at least once.<sup>37</sup> Tables A2-3 and A2-4 in the appendix contain data from 2005/6 and 2001/2, respectively, on 15 year olds reporting the age at which they first became drunk, as well as the age at which they began drinking.

**Table 5: Youth reporting ever having been drunk, 2009/10**

Age (years)	Total (%) (Int'l ranking)	All Boys (%)	Jews (%)	Arabs (%)	All Girls (%)	Jews (%)	Arabs (%)
11		11.5	7.9	18.1	1.9	1.8	2.0
13		15.4	16.6	12.9	5.6	7.6	1.3
15		35.6	41.9	16.6	15.1	20.3	3.8
<b>Total</b>	25.1 (20/36)						

Source: Health Behavior in School-aged Children study (HBSC) Y. Harel, Personal Communication, 2011-12

Table 6 presents more severe alcohol drinking behavior: those reporting having been drunk at least twice. Data for the years 2001/2 and 2005/6 are presented. Both 11 year-old Israeli boys and girls ranked quite high relative to the other HBSC countries. On the other hand, at ages 13 and 15 the reverse is true. A troubling increase over time in the prevalence of drunkenness in 11 year old boys and especially girls can be seen, although the absolute rates are still small.<sup>38</sup> Additional data from 2001/2, which includes an international comparison of youth (including Israeli) having been drunk at least twice can be found in Table A2-5 in the appendix.

**Table 6: HBSC: Youth who report having been drunk two or more times, 2001/2 vs. 2005/6**

Age (years)	Boys 2001/2 (%)	Boys 2005/6 (%)	HBSC Multi-country Int'l avg. 2005/6 (%)	Rank (for 2005/6)	Girls 2001/2 (%)	Girls 2005/6 (%)	HBSC Multi-country Int'l avg. 2005/6 (%)	Rank (for 2005/6)
11	7.3	9	4	6 <sup>th</sup>	1.3	3	2	8 <sup>th</sup> (tied with Latvia)
13	11.3	10	13	27 <sup>th</sup>	4.5	4	9	33 <sup>rd</sup> (tied with Switzerland, Greece, Iceland, and Sweden)
15	21.1	22	37	40 <sup>th</sup>	10.5	11	30	40 <sup>th</sup>

Source: Health Behaviors in School-aged Children study (HBSC), 2001/2 and 2005/6.

Israeli youth who drink alcohol are also significantly more likely to smoke and use illicit drugs. According to the sixth National Epidemiological Survey in 2005, 36% of youth aged 12-18 who drink, also smoke, as opposed to only 4.9% of non-drinkers. Regarding illicit drug use, 16.9% of those who drink also use illicit drugs, while this is true of only 3.0% of those who abstain from drinking.<sup>39</sup>

#### 4.2.1.2.2 Heavy drinking

Table 7 contains data from the 2003-4 MABAT Youth survey of 6,500 adolescents aged 11-19. It portrays heavy drinkers, i.e., males imbibing more than two drinks per day (i.e., 15+ /week) and females imbibing more than one drink per day (i.e., 8+ / week). The numbers are small, but several conclusions may be drawn. A higher percentage of 16-19 year-old Arab males drink heavily in comparison with their Jewish counterparts. When analyzed by continent of birth, adolescents from the Former Soviet Union have the highest rates of heavy drinking.<sup>40</sup> (R. Goldsmith, Personal Communication, March 24, 2009).

**Table 7: Adolescents aged 11-19 engaging in heavy drinking, 2003/4**

Age	Male (%)	Female (%)	Total (%)
<b>Total</b>			
11-15	0.7	0.5	0.6
16-19	2.1	0.7	1.3
<b>Jews</b>			
11-15	0.9	0.6	0.7
16-19	1.9	1.1	1.4
<b>Arabs</b>			
11-15	0	0.3	0.2
16-19	2.6	0	1.0
<b>Israeli-born Jews</b>			
11-15	0.5	0.5	0.5
16-19	1.4	0.9	1.1
<b>Asian-born Jews</b>			
11-15	0	0	0
16-19	—*	0	—*
<b>African-born Jews</b>			

Age	Male (%)	Female (%)	Total (%)
11-15	3.3	0	1.8
16-19	0	0	0
<b>European/American-born Jews</b>			
11-15	0	0	0
16-19	0	0	0
<b>Former USSR-born Jews</b>			
11-15	4.2	1.5	2.6
16-19	4.4	2.8	3.4

\* Missing data

Source: MABAT Youth survey, 2003-4

#### 4.2.1.2.3 Binge drinking

Table 8 presents the 2009/2010 HBSC survey, which reported the number of times youth engaged in binge drinking by age, gender, and ethnic group. Binge drinking was defined as drinking 5 or more drinks at one sitting for both genders. This results in a conservative estimate for girls, as binge drinking in women is defined in the scientific literature as drinking 4 or more drinks on a single occasion. Among all Israeli youth, over three-quarters never engaged in binge drinking, 6.7% did so only once, while 5.6% engaged in binge drinking two or more times. There was a higher prevalence of binge drinking among boys than girls at all ages. Arabs were more likely to have engaged in binge drinking than Jews. The main driver of this trend was increased binge drinking among Arab boys relative to Jewish boys.

**Table 8: Number of times youth engaged in binge drinking by age, gender and ethnic group, 2009/10**

	Jews			Arabs			All		
	Boys (%)	Girls (%)	Total (%)	Boys (%)	Girls (%)	Total (%)	Boys (%)	Girls (%)	Total (%)
<b>Never</b>	75.4	85.0	80.2	63.3	79.4	71.4	72.2	83.5	<b>77.8</b>
<b>Not in the last month</b>	8.3	7.5	7.9	15.8	14.5	15.2	10.3	9.4	<b>9.9</b>
<b>Once</b>	8.2	4.9	6.5	9.7	4.5	7.1	8.6	4.8	<b>6.7</b>
<b>Twice</b>	3.8	1.4	2.6	5.2	1.1	3.1	4.2	1.3	<b>2.7</b>
<b>Three times</b>	1.9	0.6	1.2	2.7	0.3	1.5	2.1	0.5	<b>1.3</b>
<b>Four or more times</b>	2.5	0.6	1.5	3.2	0.4	1.8	2.7	0.5	<b>1.6</b>

Source: Health Behaviors in School-aged Children study (HBSC) 2009/10 survey. Y. Harel, Personal Communication, 2011.

Relative to native-born Israelis, a much higher proportion of adolescents born in the Former Soviet Union (FSU) engaged in binge drinking. This has been corroborated by data from national surveys that show a higher rate of self-reported drinking among immigrant adolescents as compared with Israeli-born adolescents. In a 2007 survey of 750 FSU immigrant adolescents between the ages of 12 and 18, 88% reported drinking during the past year, 30.2% reported getting drunk at least four times during the past year, and 37% reported binge drinking at least once during the past year.<sup>41</sup> Whereas the focus of drinking has traditionally been on immigrant adolescents from the FSU, research by the Israel Anti-Drug Authority shows that the rates of reported drinking among Ethiopian immigrant adolescents are much higher than the national average. In a survey of approximately 500 mostly male Ethiopian adolescents, 67% reported drinking alcohol in the year prior to the survey, and of these, 43% had gotten drunk at least once.<sup>42</sup>

## 4.2.2 Burden of Disease

### 4.2.2.1 Acute Injury

#### 4.2.2.1.1 Motor vehicle accidents (MVA's)

According to the Road Safety Authority, in the year 2008 there were 483 motor vehicle accidents where the driver was under the influence of alcohol and/or other drugs.<sup>d</sup> Of these, 76 were severe and 407 were of light severity. In reviewing the trend over the 2000-2008 period (Table 9), it appears that after only minor fluctuations from 2000-2005, an increase occurred in 2006, with a slight decrease in 2008 relative to 2007.<sup>43</sup>

**Table 9: Drivers involved in MVAs while under the influence of alcohol and/or drugs, 2001-8**

Severity of MVA	2000	2001	2002	2003	2004	2005	2006	2007	2008
<b>Severe</b>	44	48	56	49	60	48	88	91	76
<b>Light</b>	218	255	256	275	274	265	470	459	407
<b>Total</b>	262	303	312	324	364	313	558	550	483

Source: D. Shimoni of Road Safety Authority, Personal Communication, 2009.

In 2008, the majority of MVA's involved only one vehicle, roughly a third involved two moving vehicles, and 14% involved a pedestrian. The highest rate of severe accidents occurred in drivers aged 18 and under and decreased with increasing age. A similar pattern was found among drivers involved in accidents of light severity, except that in this type of accident, the highest rate occurred among drivers aged 19-24, followed by those aged 18 and under. Nearly twice as many MVAs occur on Fridays and Saturdays, with almost half of all MVAs (238 out of 483 in the year 2008) occurring on those two days. About half of the MVAs occurred between the hours of midnight and 6 am (238 out of 483 during 2008), while a quarter occurred from 18:00 to midnight (132 out of 483 during 2008). See Appendix 3 for more details.

In Israel, assessing body fluids for alcohol concentration in cases of driver fatalities is not routine. The prevalence of alcohol-related driver fatalities during the years 2000-4 was estimated using data on 443 drivers aged 17 and older from two sources: the 50% of the fatalities on which autopsies were conducted, as well as from non-autopsied fatalities. Between 8-17% of all driver fatalities had a BAC above the legal limit (0.05%). Most alcohol-related driver fatalities exhibited a relatively high BAC, with the mean being three times higher than the legal limit. Most of the fatalities occurred in males aged 21-30, and took place on weekends.<sup>44</sup> A telephone survey of 500 people 17 years of age and older, conducted in 2010 by the National Road Safety Authority, found that 23% think they can drive after drinking two servings of alcohol, while 17% think they can drive after drinking three or more servings of alcohol. Furthermore, 23% said they drove even when they felt drunk, while 10% reported doing this more than once. Fifty three percent said they designate a driver before going out. This was more common among the younger drivers.<sup>45</sup>

<sup>d</sup> This number includes MVAs due to either alcohol or drugs, but the Road Safety Authority is of the opinion that the vast majority of drivers under the influence of drugs were also under the influence of alcohol.

#### 4.2.2.1.2 Alcohol-related violence

The literature on alcohol use demonstrates a two-way association between alcohol consumption and violent behavior:<sup>46, 47</sup> Not only does alcohol use promote aggressive behavior, but victimization may also lead to excessive alcohol use. According to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), alcohol-related violence is far more common than violence associated with the use of any other drug.<sup>48</sup> Alcohol has been found to be the most frequently implicated substance used in violent crimes.<sup>49</sup> There is a vast amount of literature and ongoing research examining the complex relationships between violence or aggression and alcohol consumption. Several explanatory models have been proposed. These include implicating the direct disinhibiting effects of alcohol on the brain, social and cultural expectancies (i.e., aggressive behavior as a result of one's expectation that alcohol promotes aggression), childhood victimization (leading to imitation of the alcohol abuse and violent behavior observed in childhood), and the common underlying causes for alcohol misuse and violence such as a risk-seeking personality, lack of parental supervision, or an anti-social personality disorder.

On a physiological level, abnormalities in brain chemistry involving low levels of serotonin (leading to early-onset alcoholism in men as well as impulsivity and aggressiveness) and high levels of testosterone have been implicated.<sup>50</sup>

Studies vary in their estimates of the percentage of offenders who were under the influence of alcohol while committing a crime. It is important to note that rates of alcohol involvement vary across studies depending on the methodology and definition of alcohol involvement. A study entitled *Alcohol and Crime* conducted by the U.S. Department of Justice, analyzed national data on the prevalence of alcohol involvement in crime. They observed that approximately four in ten violent crimes involved alcohol use by the offender.<sup>51</sup> The following figures represent the upper limits of a wide range of values present in a review describing violent offenders who were drinking at the time of committing a crime: 86% of homicides, 37% of assaults, 60% of sexual offenses, 57% of men and 27% of women involved in marital violence, and 13% of child abuse cases.<sup>52</sup> In another review of epidemiological studies on alcohol and violence, six studies reported alcohol involvement in 35% to 65% of rapes, two studies indicated alcohol involvement in 50% of incest cases, three studies reported alcohol involvement in 20% to 83% of family violence cases, and two studies indicated alcohol involvement in 10% to 83% of murders and homicides.<sup>53</sup>

A national clinical survey examined the role of alcohol and drugs in homicides in England and Wales. A 3-year (1996-9) consecutive sample of people convicted of homicide was used. Of the 1,594 perpetrators of homicide, 42% had a history of alcohol misuse or dependence. Alcohol played a role in 45% of the homicides.<sup>54</sup> A study was conducted in Finland, using national mortality and population data from 1987 to 1996 to analyze sex- and age-specific rates, proportions, and trends of violent deaths associated with alcohol. Deaths were defined as alcohol-related when alcohol was verified as a contributing factor to death. Alcohol-related violent deaths constituted 23.3% of the violent deaths that occurred during the study period. Among 15- to 64-year-olds, 28.6% of accidents, 30.5% of suicides, and 55.3% of homicides were associated with alcohol.<sup>55</sup> In a study done to examine the regional variation of drinking and lethal violence in Russia, a positive and significant association between alcohol consumption and homicide was found. A 1% increase in regional consumption of alcohol was associated with an approximately 0.25% increase in homicide rates.<sup>56</sup>

Violence is also associated with the location of outlets selling alcohol. Studies indicate that in and near neighborhoods with a high density of alcohol-selling establishments, a higher rate of violence exists.<sup>57</sup>

#### 4.2.2.1.2.1 Intimate Partner Violence

A strong association between alcohol use and the occurrence of intimate partner violence (IPV) has been noted in many countries. Many perpetrators have been shown to have been drunk prior to committing an assault and others may have been alcohol dependent. Evidence suggests that alcohol use increases the occurrence and severity of domestic violence. Couples with alcohol-related problems are more likely to report intimate partner violence.<sup>58</sup>

Studies of IPV routinely identify recent consumption of alcohol by perpetrators. However, the estimates vary between countries. In the U.S., two-thirds of victims of intimate partner violence reported that alcohol was involved in the incident.<sup>51</sup> In England and Wales, victims believed their partner to have been drinking prior to a physical assault in 32% of cases.<sup>59</sup> In Australia, 36% of intimate partner homicide offenders were under the influence of alcohol at the time of the incident, and in Russia, 10.5% of such offenders were intoxicated. In South Africa, a total of 65% of women experiencing spousal abuse within the last 12 months reported that their partners “always” or “sometimes” used alcohol before the assault.<sup>60</sup>

#### 4.2.2.1.2.2 Child abuse

Child abuse is one of the many types of violence associated with alcohol use and abuse, either as a consequence or as a causative factor. Among confirmed cases of child maltreatment, 40% involve the use of alcohol or other drugs.<sup>61</sup>

Data on the percentage of offenders who were drinking at the time of committing crimes in Israel is currently unavailable.

#### 4.2.2.2 Chronic disease

There is increasing evidence linking alcohol to a number of chronic diseases, in particular, cancer, cardiovascular disease, cirrhosis, and mental disorders. Worldwide, six percent of cancer deaths have been attributable to alcohol intake.<sup>62</sup>

Alcohol consumption has been recognized by the International Agency for Research on Cancer a cause of **colorectal cancer**. A 2011 systematic review<sup>63</sup> further quantified this association, showing strong evidence of a dose-risk relationship between consumption of over one drink/day and colorectal cancer risk.

A systematic review of case-control and cohort studies published in 2010 supports an association between even light (and certainly heavy) alcohol consumption and both **oral and pharyngeal cancers**.<sup>64</sup> The relationship is particularly strong for pharyngeal cancer, especially at higher levels of consumption (e.g., RR= 9.03 (95% CI, 4.46-18.37) for hypopharyngeal cancer in heavy drinkers).

**Laryngeal cancer** has been shown in a 2010 systematic review to be associated with moderate (>1 to <4 drinks/day) (RR=1.47; 95% CI: 1.25-1.72) and, to an even greater degree, heavy (4+drinks/day) alcohol consumption (RR=2.62; 95% CI: 2.13-3.23).<sup>65</sup>

A systematic review of alcohol consumption and the risk of **nasopharyngeal carcinoma** (NPC), used case-control evidence to show a potential J-shaped dose-response trend: light consumption of alcohol may lead to a reduced risk of NPC, while heavy consumption may increase the risk.<sup>66</sup>

A meta-analysis assessing the association of alcohol consumption and the risk of **pancreatic cancer** found evidence from cohort studies of an increased risk only for heavy (vs. moderate) alcohol consumption. They concluded that given that in most populations a low prevalence of heavy drinkers exists, alcohol is probably responsible for only a small fraction of all pancreatic cancers.<sup>67</sup>

Patra et al.<sup>68</sup> undertook a systematic review to assess the relationship between alcohol consumption and ischemic vs. hemorrhagic stroke. Hemorrhagic stroke exhibited a monotonically increasing risk for increasing consumption, while ischemic stroke displayed a protective effect of alcohol at low to moderate alcohol consumption, but increased the risk at higher levels of consumption.

In addition to the association between the aforementioned diseases and alcohol, a systematic review conducted by Rehm et al. found the following conditions to be also linked to some degree with alcohol: epilepsy, cardiac arrhythmias, esophageal varices, gastro-esophageal hemorrhage, acute pancreatitis, spontaneous abortion, low birth weight, and psoriasis.<sup>69</sup>

In terms of major alcohol-attributable causes of death, the CDC reported that, on average, between 2001 and 2005, 19,274 deaths from alcohol-related liver disease and cirrhosis of the liver occurred in the US.<sup>70</sup> In a study conducted in Norway to investigate the incidence rate and causes of cirrhosis from 1999-2004, the incidence rate of cirrhosis was found to be 134 per million per year. The majority of cases (53%) were determined to be due to alcoholic liver disease.<sup>71</sup>

In a study done in 2002 to estimate alcohol-related chronic disease, deaths and hospitalizations in Canada, 1,631 chronic disease deaths among adults aged 69 years and younger were attributed to alcohol consumption. These deaths comprised 2.4% of the deaths in Canada in this age group.<sup>72</sup> A study designed to estimate the burden of disease attributable to alcohol consumption in Portugal, found that 3.8% of all deaths in that country were associated with alcohol consumption. These accounted for 4,054 deaths per year. Most died of liver disease (28.3%, representing 1,147 individuals), followed by car accidents (26.2%, representing 1,062 individuals), and various types of cancer associated with alcohol consumption (21%, representing 851 individuals). The burden of disease attributable to alcohol was 5%.<sup>73</sup> There are, as yet, no studies documenting the burden of chronic diseases due to alcohol consumption in Israel.

## 5. Financial Burden

The global burden of disease and injury, as well as the economic costs attributable to alcohol were estimated. Alcohol-related costs amounted to 1.3-3.3% of the GDP in middle and high income countries.<sup>74</sup> Both the direct and the indirect costs of alcohol misuse are substantial. Most of the costs were attributable to expenditures on medical treatment, to productivity losses, and to societal losses due to premature deaths caused by alcohol-related problems. In the U.S., the estimated economic cost of excessive drinking was \$223.5 billion in 2006. This was due to the following: lost productivity-72.2%, healthcare costs-11%, criminal justice costs-9.4%, and other effects (such as property damage, motor vehicle crashes, etc.)-7.5% (it should be noted that these categories are not mutually exclusive and therefore overlap to some degree). Most of the cost was attributable to binge drinking (\$170.7 billion), underage drinking (\$27 billion), and drinking during pregnancy (\$5.2 billion).<sup>75</sup>

## 6. Objectives

### 6.1 Regular objectives

#### 6.1.1 International

##### 6.1.1.1 U.S. – Healthy People 2020 (See Appendix 4)

##### 6.1.1.2 WHO European Region: Health 21

**Objective:** In all countries, per capita alcohol consumption should not increase or exceed 6 liters per year, and should be close to zero in under 15-year-olds.

#### 6.1.2 Israel

##### 6.1.2.1 Reduce the percentage of youth who consume alcoholic beverages at least once weekly by 10%.

Table 10: Youth who consume alcoholic beverages at least once weekly

Age Group (years)	Baseline (%)	2020 Target (%)
<b>Boys</b>		
11	17.7	15.9
13	17.2	15.5
15	28.1	25.3
<b>Girls</b>		
11	5.5	5
13	8.8	7.9
15	10.6	9.5

**Rationale:** Based on the target-setting method used in HP2020 – a ten percent improvement

Data source: Health Behaviors in School-aged Children study (HBSC) 2009/10 survey

##### 6.1.2.2 Reduce the percentage of youth who engage in binge drinking by 10%.

Table 11: Youth who engage in binge drinking

Gender	Baseline (%)	2020 Target (%)
Males	27.8	25
Females	16.5	14.9

**Rationale:** Based on the target-setting method used in HP2020 – a ten percent improvement

Data Source: Health Behaviors in School-aged Children study (HBSC)- 2009/10 survey

**Note:** As binge drinking in girls was defined in the 2009/2010 survey as drinking 5 drinks (rather than the 4 drinks in one sitting, considered as binge drinking by Israeli authorities at the time of publication of this report), the 2020 target has been similarly defined.

### 6.1.2.3 Reduce the percentage of youth who engage in heavy drinking by 10%.

**Table 12: Youth engaged in heavy drinking**

Gender and age group	Baseline (%)	2020 Target (%)
<b>Males</b>		
11-15	0.7	0.6
16-19	2.1	1.9
<b>Females</b>		
11-15	0.5	0.45
16-19	0.7	0.6

**Rationale:** Based on the target-setting method used in HP2020 – a ten percent improvement  
Data source: MABAT Youth survey data, 2003/4

### 6.1.2.4 Reduce the percentage of adults who engage in heavy drinking by 10%.

**Table 13: Adults who engage in heavy drinking**

Gender	Baseline (%)	2020 Target (%)
Women	0.7	0.6
Men	1.3	1.2

**Rationale:** Based on the target-setting method used in HP2020 – a ten percent improvement  
Data source : Israeli National Health Interview Survey (INHIS), 2009/2010

### 6.1.2.5 Reduce the average annual per capita consumption of alcohol by 10%.

**Table 14: Average per capita annual alcohol consumption**

Baseline (liters/capita)	2020 Target (liters/capita)
2.5	2.25

**Rationale:** Based on the target-setting method used in HP2020 – a ten percent improvement  
Data source: OECD Health Data 2011; WHO (2011a).<sup>76</sup>

### 6.1.2.6 Reduce the rate of fatal and severe injuries caused by alcohol-related and drug-related motor vehicle accidents by 5%.

**Table 15: Alcohol-related fatal and severe MVA injury rate**

Baseline	2020 Target
1.29*	1.23

\* Derivation:  $1.29 = \text{fatal and severe alcohol-related injury rate per 1000 kilometers driven in 2009.}$   
 $= 18 \text{ (fatal) + } 45 \text{ (severe) alcohol-related MVA injuries} = 63 \text{ fatal + severe injuries} / 48,770 \text{ million km/yr} \times 1000.$

**Rationale:** Based on the target-setting method used in HP2020 – a five percent improvement.  
 Datasources: Driving under the influence of alcohol-injuries, MVAs, and testing of drivers, 2009, OrYarok Association for Safer Driving in Israel.<sup>77</sup>  
 Israeli Central Bureau of Statistics<sup>78</sup>

## **6.2 Developmental data objectives**

**Determine the percentage of adults who engage in binge drinking.**

**Determine the incidence and prevalence of pregnant women who drink alcohol.**

**Determine the number of babies born annually with fetal alcohol syndrome.**

**Determine the percentage of offenders who were drinking at the time they committed a crime, for all categories of crime.**

**Collect appropriate body fluids from involved drivers to determine alcohol-related impairment in all MVA fatalities.**

**Determine the incidence and prevalence of cirrhosis and the percentage of the cirrhosis cases due to alcoholic liver disease.**

**Determine the burden of disease attributable to alcohol consumption.**

## 7. Interventions

### 7.1 Background: recent Israeli legislation

Since 2010 the Knesset has passed legislation designed to limit alcohol intake, especially in youth. This legislation is listed below:<sup>79</sup>

- Limiting alcohol possession by minors:<sup>e</sup>
  - ◆ Alcoholic beverages may not be consumed or held in one's possession in an open container (bottle, can, glass, etc.) in a public place or in a car parked in a public place between the hours of 21:00 and 06:00.
  - ◆ Minors may not consume or possess alcoholic beverages in an open container (bottle, can, glass, etc.) in a public place or in a car parked in a public place at any hour of the day. If a minor possesses an alcoholic beverage and a police officer suspects that the minor will drink the beverage, the officer has the authority to confiscate and dispose of the beverage.
  - ◆ Police officers have the authority to confiscate alcoholic beverage containers and dispose of their contents at any hour of the day if they perceive a threat to public safety. This applies to alcohol in the possession of adults, as well as minors.
- Limiting the late night sale of alcohol:
  - ◆ Between the hours of 23:00 and 06:00 it is forbidden to sell alcohol in all business establishments except restaurants, coffee-houses, and establishments serving alcohol for on-site consumption (pubs, night clubs, catering services, etc.).
- Limiting the advertising of alcoholic beverages:
  - ◆ Alcoholic drinks may not be advertised on billboards or buses, nor in any printed materials or broadcasts designated for minors, nor aired during broadcast time slots when minors are typically in the audience.
  - ◆ Alcohol advertisements may only contain the following information: the brand name, the external shape of the container, and the location where it may be purchased.
  - ◆ Alcohol advertisements by role models, athletes ("sports icons"), and fashion models are prohibited.
  - ◆ Alcoholic beverages may not be awarded as prizes on programs aired on television or on the radio. Strong alcoholic beverages, defined as those containing more than 15.5% alcohol by volume, may not be awarded as prizes or as incentives to enter a prize-bearing competition or a lottery to receive prizes. The commercial name of the manufacturer of alcoholic beverages may not be mentioned when listing prize donors even for non-alcoholic beverage prizes produced by the same manufacturer.

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e Under 17 years of age.

- ◆ No more than three alcoholic beverage advertisements may be printed in any single edition of a newspaper or in any other printed material unless the advertisements also portray other non-alcoholic items and no more than 5% of the advertisement space is allotted to the alcoholic beverage.
- Amendment to the Transportation Bill:
  - ◆ Reduction of the BAC to 0.01% for younger drivers (under 24 years of age), drivers of public transportation vehicles, and drivers of commercial vehicles weighing over 3.5 tons.

## **7.2 Evidence-based interventions**

### **7.2.1 Methodology**

The evidence-based interventions listed below were to a large degree derived from the Task Force for Community Preventive Services (TFPCS), the U. S. Preventive Services Task Force, (USPSTF), and the Cochrane Collaboration database. Recommendations current as of August 2012 were reviewed.

In addition, systematic reviews in the PubMed database were accessed using the following keywords for interventions to prevent excessive consumption of alcohol: interventions AND prevention AND excessive consumption AND alcohol OR binge drinking OR heavy drinking. The year of publication was not a limiting factor.

### **7.2.2 Specific Interventions**

#### **7.2.2.1 General population**

##### **7.2.2.1.1 Increasing taxes on alcoholic beverages**

###### **7.2.2.1.1.1 Scientific basis**

On the basis of a systematic review, the Task Force on Community Preventive Services (TFPCS) found strong evidence of the effectiveness of increasing the unit price of alcohol by raising taxes to reduce excessive alcohol consumption and related harms. These harms include alcohol-impaired driving, motor vehicle accidents, various measures of violence, and liver cirrhosis. Another systematic review strengthened the above conclusions and reported effect sizes for reductions in mortality and morbidity rates due to disease and injury. Wagenaar et al. found that doubling the alcohol tax would reduce alcohol-related mortality by an average of 35%, traffic crash deaths by 11%, sexually transmitted disease by 6%, violence by 2%, and crime by 1.4%.<sup>80</sup> Public health effects were proportional to the size of the tax increase. Most of the studies in the review found that consumption is responsive to price and that the impact of a potential alcohol tax increase is likely to be proportional to its size. For societal levels of alcohol consumption, the majority of estimates of price elasticity were within the range of -0.30 to -1.00, meaning that a 10% increase in alcohol prices could be expected to result in a 3-10% decrease in alcohol consumption.<sup>81</sup>

The review found that the price elasticity of alcohol consumption was as follows:

- a. Beer consumption: -0.50
- b. Wine consumption: -0.64
- c. Spirits consumption: -0.79
- d. Total alcohol (ethanol) consumption: -0.77<sup>82</sup>

These conclusions are similar to the findings of a recent meta-analysis which found a highly significant relationship between alcohol tax or price measures and indices of sales or consumption of alcohol. The meta-analysis demonstrated that pricing or taxation level affect both heavy drinking and overall drinking, but has less of an effect on the former than the latter.<sup>83</sup>

The systematic review conducted by the TFCPS included two studies. They addressed the cost-effectiveness of alcohol tax intervention, using a modeling approach. One was specific to the U.S., but the second analyzed the comparative cost effectiveness of alternative policies to reduce the burden of hazardous alcohol use for 12 WHO sub-regions. The study found that taxation was the most effective and cost-effective intervention in populations with a 5% or greater prevalence of heavy drinkers.<sup>84</sup>

Furthermore, this systematic review found some evidence that the negative association between higher alcohol taxes and alcohol consumption may be more pronounced among groups with a higher prevalence of excessive alcohol consumption, such as youth.<sup>84</sup> There is support in the scientific literature for the contention that alcohol consumption in young people is particularly sensitive to price levels. Increasing alcohol prices has been shown to reduce many different measures of youth drinking, including the proportion of young people who are heavy drinkers, underage drinking, and per occasion binge drinking. Higher prices have also been shown to delay intentions to start drinking among younger teenagers, and to slow progression towards drinking larger amounts.<sup>85</sup>

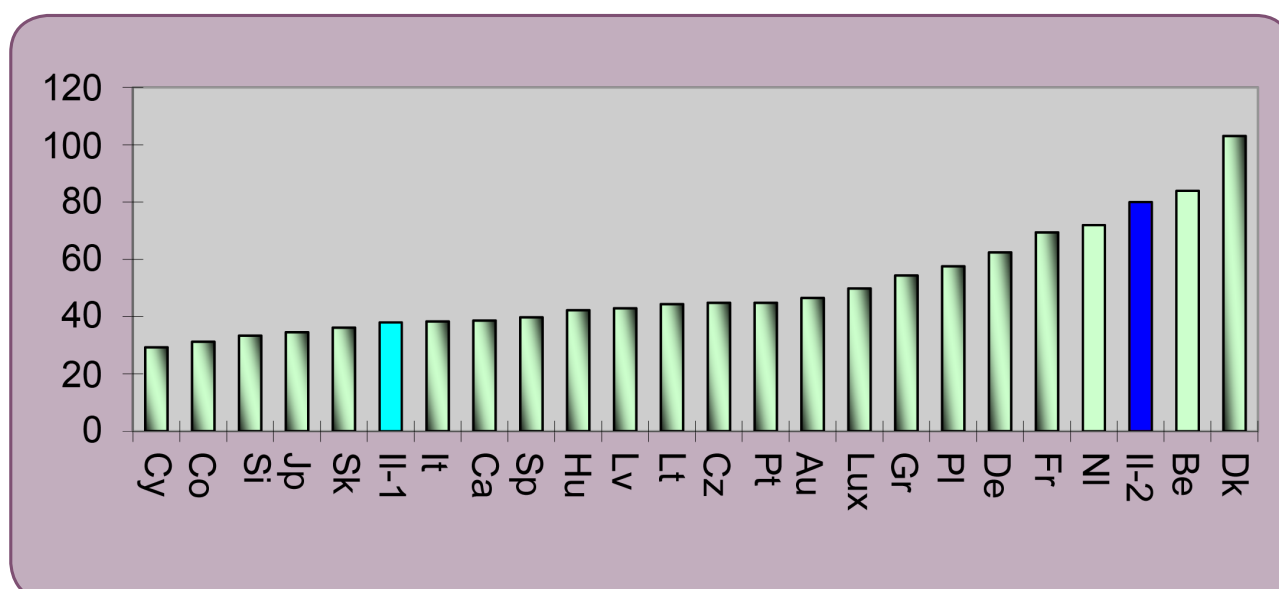
However, research conducted by Gruenewald et al. has shown that the effect of increasing taxation on alcoholic beverages is contingent upon a variety of factors. They found that the price distribution of alcohol is very wide and that increases in the prices of expensive alcohol have little impact on total sales. Increases in prices of inexpensive alcohol, though, have a large impact on sales. Therefore, tax increases appear to have different impacts on sales as a function of how they are passed on to the consumer. Higher alcohol prices may or may not cause reductions in alcohol sales and related problems because price increases may cause consumers to change their total consumption and replace their brand choices. Since alcoholic beverage prices vary, increasing taxation can cause individuals to switch to less expensive alcoholic beverages, leading to increased purchases and consumption of greater volumes of alcohol. Hence, taxation increases may paradoxically increase, rather than decrease, alcoholic consumption. Therefore the details of the policy intervention are critical. Because substitutions can minimize the impact of the taxation policy, it is better to increase prices of relatively inexpensive alcoholic beverages than to increase prices across the board. In order to maximize the consumer base, the alcohol industry often manipulates beverage prices to minimize tax impacts and assure cheaper alcoholic beverages, so as to ensure continuous increase of sales. Therefore, Gruenewald et al. recommend that the best form of regulation may be to set a minimum price that retailers may not undercut.<sup>86</sup>

Given that increases in alcohol taxes may be opposed by industry groups and the general population of alcohol consumers, the TFCPS recommends earmarking the increased revenues specifically for programs to prevent and treat alcohol abuse.<sup>87</sup> This is predicated on the observation that public support for increasing alcohol taxes has been shown to increase substantially when the increased revenues were specifically directed to alcohol prevention and treatment programs.<sup>88</sup>

### 7.2.2.1.1.2 Israeli implementation

In light of the increasing public awareness of the role of alcohol in MVAs and in inciting violent behavior, and the fact that Israeli alcohol excise taxes were low relative to those in other developed countries, in 2010 the Israeli parliament passed legislative reform increasing taxes to NIS 20/L + 75% of the base price. The tax will increase to NIS 80/L by 2014, thereby bringing Israel up to par with other high tax countries. In real terms, this means that whereas in December 2009 a 750 ml bottle of alcohol was only taxed NIS 3.5, in 2014, the tax will be NIS 24. However, this only applies to the cheaper alcoholic distilled beverages.<sup>89</sup>

**Figure 1: International comparison of average Israeli tax before (light blue bar) and after (dark blue bar) reform to increase the tax on cheap alcohol**



### 7.2.2.1.2 Screening and behavioral counseling interventions in clinical settings to reduce alcohol misuse

#### 7.2.2.1.2.1 Scientific basis

##### 7.2.2.1.2.1.1 Primary care

In 2004, the USPSTF issued a B recommendation to screen adults (including pregnant women) in primary care settings in order to accurately identify those who do not meet the criteria for alcohol dependence, but are at risk for increased morbidity and mortality. For a list of all screening tools, please see Appendix 1: Alcohol use screening tools. The USPSTF also found good evidence that brief behavioral counseling interventions, which include an initial counseling session of 15 minutes, feedback, advice, and goal-setting, and that may include follow-up, produce small to moderate reductions in alcohol consumption

that are sustained over 6-12 months or longer.<sup>10</sup> When counseling, it is important to inform patients that what is generally considered nonhazardous alcohol consumption (i.e., fewer than 5 drinks for men and 4 for women in one sitting) is also associated with injury. Indeed, a greater proportion of the population attributable fraction (PAF) of injury caused by alcohol consumption is due to alcohol consumption from what are usually considered low-risk quantities than from levels of alcohol consumption associated with alcohol dependence.<sup>90</sup>

In a Cochrane meta-analysis of 22 randomized clinical trials (RCTs) that assessed the effectiveness of a brief intervention (up to 4 sessions), the intervention group had lower alcohol consumption than the control group after a follow-up of one year or longer. For men, the benefit of brief intervention was a mean reduction in alcohol consumption of 57 gm/week (range: 25-89), but the benefit for women was not obvious. The study also found that a longer duration of counseling probably had little additional effect.<sup>91</sup> A systematic review published in July 2012 by the Agency for Healthcare Research and Quality included the results of 23 trials and 6 systematic reviews.<sup>92</sup> Subjects were typically risky/hazardous drinkers, usually excluding those with alcohol dependence. Over twelve months of follow-up, adults receiving interventions reduced alcohol consumption by 3.6 drinks/week, 12% fewer subjects reported heavy drinking episodes, and 11% more subjects drank less than recommended limits. Ten-fifteen minute repeat counseling sessions were most effective. Whereas some health-economic indices improved (e.g., hospital days and costs), for most health outcomes such as injury rates and alcohol-related liver disease, evidence for improvement was lacking.

Saitz<sup>93</sup> reviewed the effectiveness of brief interventions for patients with alcohol dependence identified by screening in the primary care setting. On the basis of the two studies addressing this population, he concluded that there was insufficient evidence to recommend the intervention in this population.

#### **7.2.2.1.2.1.2 Hospitals**

In the context of a Cochrane review, McQueen et al.<sup>94</sup> reviewed the effectiveness of brief interventions for heavy drinkers admitted to general hospital wards. On the basis of fourteen RCTs and controlled clinical trials involving primarily male participants, they concluded that a reduction of alcohol consumption was evident in the short (6 months) and in the medium term (9 months), but not at 12 months. On the other hand, significantly fewer deaths were seen even at 12 months (RR= 0.60 (CI 0.40 to 0.91)).

#### **7.2.2.1.2.2 Israeli implementation**

Preventive guidelines exist for alcohol counseling in the primary care setting.<sup>95</sup> These are typically derived from the USPSTF screening recommendations, such as those described above. As the lifetime prevalence of alcohol abuse and dependence in the U.S. is 3-4 times higher than that in Israel (17.8% and 12.5%, respectively<sup>96</sup> vs. only 4.3%<sup>34</sup> in Israel), the positive predictive value of screening in Israel is lower and hence, the rationale for a population-based screening policy is weak.

#### **7.2.2.1.3 Electronic screening and brief interventions (e-SBI)**

##### **7.2.2.1.3.1 Scientific basis**

In a recommendation issued as this report was going to press (August 2012), the TFCPS<sup>97</sup> recommended the combination of screening individuals for excessive drinking, along with the delivery of a brief

intervention, part or all of which make use of electronic devices such as computers, telephones, or mobile devices. The e-SBI is effective in the clinical, university, or community setting.

#### **7.2.2.1.3.2 Israeli implementation**

Given Israel's extensive utilization both of computers and mobile telephones, as well as the time constraints on characterizing primary care physicians, there are strong reasons to advocate locally-tailored implementation of this intervention.

#### **7.2.2.1.4 Regulation of outlet density to prevent excessive use of alcohol**

##### **7.2.2.1.4.1 Scientific basis**

Alcoholic beverage outlet density is defined as the number of physical locations in which alcoholic beverages are available for purchase per population or per area. Based on a systematic review conducted by the TFCPS, regulating the density of alcohol outlets in a given area can reduce excessive alcohol consumption and related harms. The review found no studies that directly assess the control of outlet density as a means of reducing excessive alcohol consumption and related harms. However, several types of studies were found that assessed related phenomena, such as interrupted time-series studies of outlet density; studies of privatization of alcohol sales (as opposed to government regulation), alcohol bans, and changes in license arrangements – all of which affected outlet density. Most of the studies in the review found that greater outlet density is associated with increased alcohol consumption and its related sequelae such as medical harms, violence, crime, and injury. Specifically, in seven out of the nine time series studies of alcohol outlet density change, researchers observed a positive association between changes in outlet density and alcohol consumption and related harms, particularly interpersonal violence. Studies that assessed the relationship between alcohol outlet density and motor vehicle crashes showed mixed results.<sup>98</sup> Studies of the effect of alcohol bans found that the effectiveness of bans in reducing alcohol-related harms seems to be dependent on the availability of alcohol in the surrounding area. In isolated communities, bans can substantially reduce alcohol-related harms. But if alcohol is available in areas nearby those with bans, travel between these areas can lead to serious harm. Studies on licensing policy changes found that more permissive licensing procedures increased the number of alcohol outlets. This then led to increases in alcohol consumption and related harms.<sup>99</sup> Secondary evidence from cross-sectional studies generally showed a consistent positive association between alcohol outlet density and excessive consumption and related harms, with the possible exception of inconsistent findings regarding injuries.

##### **7.2.2.1.4.2 Israeli implementation**

Israel does not regulate outlet density of stores selling alcoholic beverages for external consumption (i.e., to be consumed outside of the establishment where it is sold), although licensing authorities are empowered by law to consider the needs of individuals living in close proximity to the outlet, and may withhold licensing from problematic establishments<sup>100</sup> Regulation of outlet density should be considered by legislators.

### 7.2.2.1.5 Dram<sup>f</sup> shop liability

#### 7.2.2.1.5.1 Scientific basis

Dram shop liability stipulates that the owner of, or server in, a retail alcohol establishment where a customer has recently consumed alcoholic beverages, may be held legally responsible for any harms inflicted by that customer such as death, injury, or other damages resulting from an alcohol-related car crash. A systematic review conducted by the TFCPS, included studies that assessed the effects of state dram shop liability laws on diverse outcomes, including overall motor vehicle fatalities, alcohol-related motor vehicle fatalities, alcohol consumption behaviors, alcohol-related violence, and alcohol-related diseases. Most studies found reductions in alcohol-related outcomes associated with the presence of dram shop liability.<sup>101</sup>

#### 7.2.2.1.5.2 Israeli implementation

There is a general consensus that the challenges involved in assessing liability makes enforcement of such a law unlikely. That said, further exploration of this effective model appears warranted.

### 7.2.2.1.6 De-privatization of retail alcohol sales to decrease the sale and excess consumption of alcohol

#### 7.2.2.1.6.1 Scientific basis

The *privatization* of retail alcohol sales is defined as the repeal of government control over the retail sales of one or more types of alcoholic beverages, thus allowing commercial retailing of those beverages. The privatization of retail alcohol sales generally applies only to *off-premises* alcohol outlets – retail locations, such as liquor stores, where alcoholic beverages are sold for consumption elsewhere. Privatization does not generally affect the retail sales of alcoholic beverages at *on-premises* alcohol outlets – locations such as bars and restaurants, where alcoholic beverages are sold for consumption on-site. *Re-monopolization* of retail alcohol sales is the re-establishment of government control over the retail sale of one or more types of alcoholic beverages.

On the basis of on a systematic review conducted by the TFCPS, it recommends against the further privatization of alcohol sales in settings with current government control of retail sales, based on strong evidence that privatization results in increased per capita alcohol consumption, a well-established proxy for excessive consumption.<sup>102</sup>

#### 7.2.2.1.6.2 Israeli implementation

The sale of alcohol is not government-controlled in Israel. The ramifications of implementing this strategy in Israel should be examined by legislators.

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f Historically, the term dram shop referred to any establishment where alcohol was sold; a dram is a weight measure and can also mean a draft of alcohol.

### **7.2.2.1.7 Utilization and publicity of sobriety checkpoints to reduce alcohol impaired driving**

#### **7.2.2.1.7.1 Scientific basis**

Based on a systematic review conducted by the TFCPS, sobriety checkpoints were shown to be effective in reducing alcohol impaired driving, crashes, and associated fatal and nonfatal injuries. Law enforcement officers use one of two systems to stop drivers and assess their level of alcohol impairment at sobriety checkpoints.

1. Random breath testing (RBT), where drivers are randomly selected and tested for blood alcohol levels.
2. Selective breath testing (SBT) checkpoints, where officers must have reason to suspect a driver has been drinking before testing. SBT is the only type of sobriety checkpoint used in the United States.

The review found a decrease in crashes and fatal crashes thought to involve alcohol. For the former, a median decrease of 18% was noted for RBT checkpoints and 20% for SBT checkpoints. For fatal crashes thought to involve alcohol, a median decrease of 22% was noted for RBT checkpoints and a median decrease of 20-26% for SBT checkpoints. The decline in crash rates was seen, regardless of follow up time, with a median decrease of 18% for follow-up times of less than one year, and 17% for follow-up times of more than one year.<sup>103</sup>

A review of random screening programs to detect alcohol use, which included RBT checkpoints, was conducted by Peek-Asa to determine their effect on fatalities and injuries. The review included 14 studies. In all of the studies, random screening was found to decrease fatalities and injuries. There was wide variation in the range of the decrease in alcohol-related fatalities: 8-71%. The author concluded that random screening appeared to be effective in a wide range of both U.S. and Australian populations. However, further research is necessary to establish how long the effects of random alcohol screening could be sustained, as well as the level of enforcement necessary to achieve these objectives.<sup>104</sup> A review article by Fell et al. advocates modest staffing of sobriety checkpoints. Staffing checkpoints with as few as three to five officers has been shown to be as effective as staffing with 15 or more officers.<sup>105</sup>

#### **7.2.2.1.7.2 Israeli implementation**

Israeli police conduct random breath tests. Data collection to determine the impact of this intervention on alcohol-related fatalities and injuries should be undertaken. The optimal staffing of checkpoint teams should be determined.

### **7.2.2.1.8 Development and fielding of mass media campaigns to reduce alcohol impaired driving**

#### **7.2.2.1.8.1 Scientific basis**

Mass media campaigns are designed to convince the public to either avoid drinking and driving or to prevent others from doing so. Common themes include fear of arrest; fear of injury to self, others, or property; and characterizing drinking drivers as irresponsible and dangerous to others.

Based on a systematic review of eight studies, the TFCPS found strong evidence supporting the effectiveness of mass media campaigns (under certain conditions) to reduce alcohol-impaired driving.

Effective mass media campaigns need to be carefully planned and well-executed, attain adequate audience exposure, and be implemented in settings that have other ongoing alcohol-impaired driving prevention activities.

The review found a median decrease of 13% in total alcohol-related crashes, 10% in injury-producing alcohol-related crashes, and a decrease of 37% from baseline at mid-campaign, and 67% immediately after the campaign, in the proportion of “high-risk” male drivers who had consumed alcohol. The mass media campaigns that were evaluated had several common features: a theoretical framework in communications research, pretested messages, high levels of audience exposure to the message – mostly through paid advertising, and implementation in settings that had other prevention efforts in place, such as high-visibility enforcement of impaired driving laws. Campaign messages ranged from those focused on law enforcement activities and the legal consequences of drinking and driving, to the social and health consequences of alcohol-impaired driving. Results, though, did not differ according to the message appeals used.<sup>106</sup>

#### **7.2.2.1.8.2 Israeli implementation**

Mass media campaigns have been implemented in Israel; the assessment of their effectiveness is ongoing and should be expanded.

#### **7.2.2.1.9 Promotion of ignition interlocks for people convicted of alcohol impaired driving**

##### **7.2.2.1.9.1 Scientific basis**

Ignition interlocks installed in motor vehicles to prevent people who have been previously convicted of alcohol-impaired driving from driving while under the influence of alcohol. To operate the vehicle, the driver must first give a breath specimen. If the breath alcohol concentration (BrAC) of the specimen is too high, (usually 0.02-0.04%), the vehicle will not start. Interlocks may be either mandated through the court system or offered as an alternative to a suspended license by a state licensing agency. The amount of time they are installed typically matches the period of license suspension – generally ranging from 6 to 24 months. Research shows that only a small proportion of people eligible for ignition interlock programs typically participate.

A Cochrane review on the effectiveness of the ignition interlock programs in reducing the recidivism rates of people who have been previously convicted of alcohol-impaired driving was inconclusive. They found that the low percentage of offenders who choose to have an interlock fitted makes it difficult to reach firm conclusions about their effectiveness. The review included one RCT which showed that the interlock program was effective in reducing recidivism while the device was installed in the vehicle: the relative risk of recidivism was 0.36 (95% confidence interval 0.21 to 0.63). The ten controlled trials in the review also supported this conclusion, with a general trend, in both first-time and repeat offenders, towards lower recidivism rates when the interlock device was installed. However, neither the RCT nor the controlled trials were able to provide evidence for any of the programs’ effectiveness continuing once the device had been removed. They concluded that more RCTs were needed to conclusively determine both efficacy (i.e., under controlled circumstances) and effectiveness. However, they did note that the program appeared to be effective while installed in the vehicle of the offender.<sup>107</sup>

On the basis of both the Cochrane review and a follow-up systematic review of studies that evaluated crash outcomes, the TFCPS recommended the use of ignition interlocks for people convicted of alcohol-impaired driving. They found strong evidence of their effectiveness in reducing re-arrest rates, with a median decrease of 73%, while the interlocks were installed. Drivers with interlocks installed had fewer alcohol-related crashes than those with suspended licenses. The overall crash rates though, were similar to those in the general driving population. Drivers with ignition interlocks had a substantially greater number of crashes overall than did drivers with suspended licenses, but this is likely due to the former driving more often. However, once removed, re-arrest rates returned to levels similar to those of offenders who did not have interlocks installed. They also noted that the public health benefits of this intervention are currently limited because only a small proportion of offenders choose to install interlocks in their vehicles. They advocate for more widespread and sustained use of interlocks among people convicted of alcohol-impaired driving because this intervention could have a substantial impact on alcohol-related crashes.<sup>108</sup>

#### **7.2.2.1.9.2 Israeli implementation**

Legislation for use of ignition interlocks or “alcolocks”, either within a commercial or within a rehabilitation context has been adopted in the following countries – Finland, Sweden, Netherlands, France, Belgium, Austria, and Denmark. Voluntary use in commercial transport is ongoing in Austria, Finland, Sweden, Belgium, Slovenia and the UK. Pilot projects are ongoing in Austria, Netherlands, Slovenia and Germany.<sup>109</sup> The Israeli Or-Yarok Association for Safer Driving in Israel (a local NGO) is in the process of testing the use of ignition interlocks in Israel.<sup>110</sup> Thus, this intervention merits further consideration in Israel.

#### **7.2.2.1.10 Development and fielding of multi-component interventions with community mobilization to reduce alcohol impaired driving**

##### **7.2.2.1.10.1 Scientific basis**

On the basis of a systematic review, the TFCPS found strong evidence for the effectiveness of multicomponent interventions with community mobilization in reducing alcohol impaired driving. They reviewed interventions that implemented multiple programs and/or policies in multiple settings in order to impact the community environment, and which included community mobilization components such as participation of active community coalitions or task forces in their design. The interventions included responsible beverage service programs and other efforts to limit access to alcohol, such as controlling alcohol outlet density and enforcing minimum legal drinking age laws; sobriety checkpoints; an awareness or educational campaign; and attention to other driving risks, such as speeding; and improved access to alcohol treatment.<sup>111</sup> The systematic review consisted of 6 studies and found a decrease of 9% and 42% in fatal crash outcomes (in 2 distinct studies), a decrease of 10% in nighttime injury crashes, and a decrease of 45% in crashes among drivers aged 16-20. The evaluation follow-up period ranged from 2-10 years.

##### **7.2.2.1.10.2 Israeli implementation**

This is essentially an amalgamation of the previously mentioned effective strategies, as well as others, such as improved access to treatment for alcohol dependence. It should be implemented and assessed fully in Israel as well.

## **7.2.2.2 Underage drinkers**

### **7.2.2.2.1 Enhance enforcement of laws prohibiting sales of alcohol to minors**

#### **7.2.2.2.1.1 Scientific basis**

The TFCPS recommends enhanced enforcement programs as effective means of reducing retail sales of alcohol to minors in on-premises (such as bars) and off-premises (such as liquor stores) establishments, in rural and urban communities, and among different ethnic and socioeconomic groups. The intent of the interventions is to increase retailers' perception that selling alcohol to minors will lead to quick, certain, and serious punishment. The intervention therefore entails initiating or increasing the frequency of "sting operations," i.e., retailer compliance checks to assess whether retailers are complying with laws prohibiting the sale of alcohol to minors, and then punishing offenders with legal or administrative sanctions. Part of the intervention may include publicizing greater enforcement activities (i.e., via mass media or by sending letters to retailers) to increase the retailers' perceived risk of being caught.<sup>112</sup>

#### **7.2.2.2.1.2 Israeli implementation**

Israeli law prohibits the sale of alcoholic beverages to those less than 18 years of age. In 2010 this prohibition was expanded to include all sales or delivery of alcoholic beverages to minors in public places, if not in the presence and with the consent of a responsible adult. Police may confiscate and discard any alcoholic beverage found on minors who are not accompanied by adults who consent to the drinking. Purchase of alcoholic beverages by adults for minors without the express consent of an adult accompanying the minor who is present at the time is similarly forbidden. Additionally, the onus of proof that the customer is 18 or older is on the alcohol vendor. Police officers have been empowered to impose up to a 30 day closure on establishments found in breach of these laws.<sup>113</sup>

Enhanced enforcement of these laws, using tools such as "sting operations" and increased publicity for the new laws and the legal ramifications awaiting those who are non-adherent, should be pursued and expanded upon, using local knowledge and experience.

### **7.2.2.2.2 Establishing a lower BAC for young or inexperienced drivers**

#### **7.2.2.2.2.1 Scientific basis**

A systematic review conducted by the TFCPS demonstrated that lower BAC laws (between 0 and 0.02%) for young and inexperienced drivers are effective in reducing alcohol-related motor vehicle crashes. The review showed that implementation of these laws led to a decrease of 9-24% in fatal crash outcomes, 4-17% in injury outcomes, and 11% in crashes in which the investigating police officer believed that the driver had been drinking alcohol.<sup>114</sup>

Laboratory studies show that impairment in critical driving functions begins at BACs even lower than the current Israeli limit of 0.05%: driving skills begin to deteriorate and crash involvement risk to increase at a BAC of 0.02%. At 0.05% BAC most subjects are already significantly impaired.<sup>115</sup> According to a study conducted by Zador et al., the relative risk of being involved in a fatal crash as a driver is 4-10 times greater for drivers with BACs between 0.05% and 0.07%, as compared with drivers with a BAC of 0%. It should be noted that even a BAC as low as 0.02% is estimated to more than double the relative risk of a fatal single-vehicle crash injury<sup>116</sup> relative to those with a BAC of 0%.

Two different review articles assessed the effect of laws lowering the BAC limit on the incidence of injuries and fatalities and reached a similar conclusion: the lower the BAC limit, the greater the reduction in injuries. In a review article by Fell, the data from studies in the United States showed that lowering the BAC limit from 0.10% to 0.08% resulted in a 5-16% reduction in alcohol-related crashes, fatalities, or injuries.<sup>117</sup> Fell concluded that the literature supported lowering the BAC illegal limit to reduce drunk driver fatal crashes, whether it was from 0.10% BAC to 0.08% BAC or from 0.08% BAC to 0.05% BAC for adults, or from some higher BAC level to 0.02% BAC (or lower) for youth.<sup>117</sup> A review conducted by Zwerling et al. evaluated whether lower BAC limits for younger drivers reduced motor vehicle injuries. Six studies on the topic were included. All showed a reduction in injuries or crashes, ranging from 11-33%, although not all these reductions were statistically significant. One study found that lower BAC limits resulted in greater reductions in casualties, analogous to a dose-response effect. States with 0% BAC laws reported the greatest reduction: 22% for nighttime, single vehicle fatalities. In states with 0.02% BAC laws, the reduction averaged 17%, and in states with 0.04-0.06% BAC laws, the reduction was only 7%. Hence, this review found evidence supporting the effectiveness of lowering the BAC for young drivers.<sup>118</sup>

#### **7.2.2.2.2 Israeli implementation**

As mentioned earlier, in Israel, the highest rate of severe accidents occurs in drivers aged 18 and under, followed by 19-24 year-olds. This intervention has been introduced in Israel. In 2010, the BAC was reduced to 0.01 for younger drivers (under 24 years of age). The effectiveness of this legislation should now be assessed.

#### **7.2.2.2.3 Raising the minimum legal drinking age to 21**

##### **7.2.2.2.3.1 Scientific basis**

The TFCPS reviewed the impact of the current minimum legal drinking age in all 50 states of the U.S. on road safety. The current minimum legal drinking age (MLDA) in the U.S. is 21. This has been the law since the Minimum Drinking Age Act went into effect in 1984. As of August 2012, 10 states banned underage consumption under any conditions, while the other 40 allowed various exceptions, contingent upon the presence of family members and in specific ceremonies/locations.

The TFCPS recommends maintaining the minimum legal drinking age (MLDA) laws based on strong evidence of their effectiveness in reducing alcohol-related crashes and associated injuries among 18 to 20-year-old drivers. Their review included 33 studies, most of which assessed the effects of changes in the MLDA from 18 to 21 or vice versa. They found that the crash-related outcomes decreased by a median value of 16% when the MLDA was raised. Lowering the MLDA increased crash-related outcomes by a median value of 10%. According to regression-based studies, raising the MLDA by 3 years (from 18 to 21) decreased crash-related outcomes by a median value of 12%. The follow-up times ranged from 7 to 108 months, over which the effects were stable.<sup>119</sup> It may therefore be concluded that there is good evidence to raise the MLDA in Israel from 18 to 21 years of age.

##### **7.2.2.2.3.2 Israeli implementation**

The current minimum drinking age in Israel is 18, as it is in the vast majority of developed countries worldwide.<sup>120</sup> A variety of unique factors, among them mandatory military service at age 18, pose strong challenges to implementation of this law, despite evidence of its effectiveness in other countries.

#### **7.2.2.2.4 Development and fielding of school-based programs to reduce drinking and driving and riding with drinking drivers.**

##### **7.2.2.2.4.1 Scientific basis**

School-based programs to reduce alcohol-impaired driving include instructional programs, peer organizations (for example Students Against Destructive Decisions (SADD)), and social norming campaigns. Instructional programs may solely address the problems of drunken driving (DD) and riding with drunk drivers (RDD), may focus more broadly on alcohol or other substance use. Peer organizations engage students in a variety of DD and RDD prevention activities. Social norming campaigns are generally ongoing, multiyear public information programs on college campuses that aim to reduce alcohol use by providing students with objective, normative information regarding student alcohol consumption. This is done with the goal of reducing misperceptions and, ultimately, changing drinking and driving behavior.

The TFCPS recommends school-based instructional programs to reduce riding with alcohol-impaired drivers, but found insufficient evidence to determine whether these programs reduce more significant outcomes, viz., alcohol-impaired driving or alcohol-related crashes. Furthermore, due to the small number of studies, they found insufficient evidence to determine the effectiveness of peer organizations or social norming campaigns in reducing alcohol-impaired driving. The social norming campaign studies suggest that these campaigns do reduce driving after drinking among college students exposed to the messages. However, the studies used relatively weak before-and-after designs. Hence it was difficult to draw firm conclusions.<sup>121,122</sup>

##### **7.2.2.2.4.2 Israeli implementation**

Although a dedicated program, focusing solely on the hazards of alcohol use, has thus far not been implemented in schools, a program entitled “life skills” is part of the required curriculum for all Israeli schools. Course content varies and is adapted to each grade level.<sup>123</sup> The topic of alcohol and the hazards of drinking and driving are included, beginning in the 5<sup>th</sup> grade and continuing through high school. There has not yet been a formal evaluation of the program’s impact on alcohol awareness and habits among students. However, a new pilot program on alcohol will commence in 2012 among 5<sup>th</sup> grade students in 50 schools. A pre- and post-evaluation component will be included.

#### **7.2.2.2.5 Development and fielding of family-based prevention programs to prevent alcohol misuse**

##### **7.2.2.2.5.1 Scientific basis**

A Cochrane review published in 2011<sup>124</sup> included 12 parallel-group trials. Extensive heterogeneity across various parameters of the trials led to utilization of qualitative summary methods. In nine of the twelve trials, evidence of the effectiveness of family-based interventions in preventing alcohol misuse in school-aged children up to 18 years of age was seen. Although the effects were small in size, they persisted over the long-term.

##### **7.2.2.2.5.2 Israeli implementation**

Tailored adaptation of these programs to Israel’s family-based society is strongly recommended.

## 8. Developmental interventional objectives

### **Assess the effectiveness of police patrol programs in reducing the adverse consequences of alcohol-impaired driving**

The Cochrane collaboration reviewed increasing police patrol programs via increasing the number of police patrols or the time the police spend patrolling. The studies were generally consistent in reporting beneficial effects on the incidence of traffic crashes and fatalities, but study quality and reporting were often poor. Consequently, while the evidence is supportive, it does not firmly establish whether increased police patrols reduce the adverse consequences of alcohol-impaired driving.<sup>125</sup>

#### **Israeli implementation**

Over the last decade there has been an increase in police presence in alcohol-prone areas. The effects of this intervention have not yet been published in the peer-reviewed scientific literature.<sup>126</sup>

### **Assess the effectiveness of designated driver programs in reducing alcohol-related motor vehicle accidents**

A systematic review conducted by the TFCPS by Ditter et al. in 2005 assessed the effectiveness of two types of designated driver programs in modifying driver and passenger behavior. These included population-based campaigns that use mass media and other communication channels to encourage designated driver use, and incentive programs that offer free incentives (such as free soft drinks, other nonalcoholic drinks, food or admission) to encourage customers of drinking establishments to act as designated drivers. Customers were usually informed about the availability of incentives by displays in the drinking establishment. A single population-based study of a designated driver promotion campaign was identified. The survey results indicated a 13% increase in respondents “always” selecting a designated driver, but no significant change in self-reported alcohol-impaired driving or riding with an alcohol impaired driver. Eight studies of incentive programs at drinking establishments were reviewed. Seven of these evaluated the number of patrons who identified themselves as designated drivers before and after programs were implemented. A mean increase of 0.9 designated drivers per night was noted. The eighth study reported a 6 percentage point decrease in self-reported driving or riding in a car with an intoxicated driver among respondents exposed to an incentive program. However, the public health impact of these small increases in the number of self-identified designated drivers is unknown. Additional research is necessary to establish the influence of such programs on the decision to use a designated driver, alcohol-impaired driving, and alcohol-related crashes. Ditter concludes that the present evidence is insufficient to draw conclusions about the effectiveness of either type of designated driver promotion program evaluated.<sup>127,128</sup>

#### **Israeli implementation**

Israel has used media/ad campaigns to encourage designated drivers. Incentive programs should be explored and the effectiveness of both types of interventions should be assessed.

### **Assess the effectiveness of administrative per se laws and pre-conviction driver's license suspension policies as forms of sanctions against drunk drivers to reduce alcohol impaired driving**

A review article identified three studies that evaluated the effectiveness of administrative per se laws (immediate license suspension) versus other forms of sanctions against drunk drivers. The first study observed that one state in the United States had a one third reduction in repeat arrests for drunk driving over a 3-year period among those who were arrested under administrative per se laws, relative to the recidivism seen in a comparison cohort of drivers tracked prior to the date administrative per se laws went into effect. However, two other states did not experience any change in recidivism.

The second study found that drivers whose licenses were suspended under administrative per se laws were 39% less likely during the first two years following suspension to be rearrested on the charge of driving while intoxicated, as compared with a comparison cohort. This advantage disappeared by the third year of follow-up.

The third study found both first offenders and repeat offenders arrested under administrative per se laws 34% less likely to be involved in a subsequent motor vehicle crash during the year following their arrest, as compared with those in the comparison cohort. Drivers with administrative per se suspensions were 21% less likely to be involved in additional drunk driving offenses, and 27% less likely to be involved in reckless driving offenses related to alcohol. The authors conclude that administrative per se laws governing license restriction for drivers have been shown to be effective in some states in decreasing the alcohol-related recidivism rate, as compared with drivers who were sanctioned through other conventional judicial processes<sup>129</sup>

Another article explored the effects of drivers' license suspension policies on alcohol-related crash involvement in 46 states in the U.S. Administrative or pre-conviction driver's license suspension policies have reduced alcohol-related fatal crash involvement by 5%. This is both statistically significant and substantively important in that it represents at least 800 lives saved per year in the United States. These laws have been effective with drivers at varying risk levels: from lower-risk drivers with less than the legal alcohol concentration in their blood, to extremely intoxicated drivers. However, post-conviction license suspension policies have had no discernible effects. The authors conclude that the effectiveness of a deterrence policy appears to be more strongly affected by the speed with which punishment is meted out after the offending behavior is identified, than by the severity of the penalty.<sup>130</sup>

#### **Israeli implementation**

Thirty-day administrative license suspension for driving under the influence of alcohol has been the law in Israel since 2006.<sup>131</sup> Research is needed to assess the effectiveness of this intervention.

### **Assess the effectiveness of alcohol server setting/training program interventions in reducing alcohol impaired driving**

The Cochrane collaboration reviewed the evidence for this intervention. They concluded that there was no reliable evidence to prove that these interventions were effective and that more research was needed to determine their efficacy and effectiveness.<sup>132</sup>

The TFCPS reached a similar conclusion. They found insufficient evidence to determine the effectiveness of responsible beverage service training programs in reducing excessive alcohol consumption and related harms at the community level. These programs provide education and training to servers of alcoholic beverages with the goal of altering their serving practices to prevent customer intoxication and alcohol-impaired driving. These include, for example, offering customers food with drinks, delaying service to rapid drinkers, refusing service to intoxicated or underage customers, and discouraging intoxicated customers from driving.

Although reviewed studies generally showed positive results for the measured outcomes, the majority of the evidence is from small scale studies where the participants appear to have been highly motivated. In addition, the researchers may have influenced the design and implementation of the server training. Because of these limitations, further evidence is necessary to assess the public health impact of sustainable, community-wide responsible beverage server training programs.<sup>133</sup>

### **Israeli implementation**

These programs should be assessed in Israel as well.

### **Assess the effectiveness of imposing limits on days and hours of alcohol sales**

An effective way to regulate access to alcohol is to maintain existing limits on the days when alcohol can be sold, targeting weekend days. On the basis of strong evidence, the TFCPS recommends maintaining existing limits on the days on which alcoholic beverages are sold, as a strategy for the prevention of excessive alcohol consumption and related harms. Evidence for this recommendation is based on studies assessing the effects of repealing limits on sales of alcoholic beverages on weekend days.

A total of ten studies looked at the consequences of changing the laws limiting days of sale in either off-premises settings, such as grocery, convenience, or liquor stores, or in on-premises settings, such as restaurants, bars, and sports stadiums/ballparks in a total of five countries/states including Sweden, Scotland, Australia, and U.S. Repeal of Saturday and Sunday bans was associated with either an increase in consumption and/or increases in alcohol-impaired driving and motor vehicle-related harms. Only two studies were found that assessed the effects of imposing limits on days of sale for off-premises settings. An experimental Saturday ban in 1981 in Sweden was associated with declines in alcohol-related violence and other disturbances. A local repeal of a state-wide allowance of Sunday sales in New Mexico was associated with relative declines in motor vehicle fatalities.<sup>134</sup>

Another strategy to prevent excessive alcohol consumption and related harms is to limit access by regulating the hours during which alcohol can legally be sold. Policies limiting hours of sale may apply to outlets that sell alcohol for consumption at the place of purchase (on-premises outlets, such as bars or restaurants) or elsewhere (off-premises outlets such as liquor stores). There was sufficient evidence of effectiveness in reducing excessive alcohol consumption and related harms for the TFCPS to recommend maintaining limits on the hours of alcohol sale in on-premises settings.<sup>135</sup>

**Israeli implementation**

The Israeli Knesset enacted two related laws in 2010. The first prohibits the sale and possession of alcoholic beverages by all from 23:00 to 06:00, with the exception of places such as restaurants, hotels, pubs, coffee shops, wedding halls/gardens, discotheques, fairs not housed in permanent structures, and pleasure boats. The second prohibits possession of open alcohol containers in public places (including within cars located in the public domain) between the hours of 2100 and 0600.

In Israel, there are no current restrictions regarding the days on which alcohol may be sold. Following enforcement of the new laws limiting the hours of access and assessment of their impact (along with legal and other interventions), consideration may be given to the need for additional limits such as limits on days of sale and on hours of sale in on-premises outlets.<sup>112</sup>

**Assess the effectiveness of linking the price of alcoholic beverages to their alcohol concentration**

In October of 2011, the UK introduced a new tax on beer with a high concentration of alcohol. An additional 25% tax was levied on beers containing 7.5% or more alcohol by volume (abv).<sup>136</sup> In March 2012, an additional tax change was made: a 50% tax reduction went into effect on beers with 2.8% abv or less.<sup>137</sup> These recent changes in taxation of beer in the UK have led many breweries to experiment with weaker beers that have a lower alcohol concentration. A European Union group called the Addiction and Lifestyles in Contemporary Europe – Reframing Addictions Project (ALICE RAP), recently issued a policy briefing paper in which they found the most effective policy approaches were those that resulted in people consuming fewer grams of alcohol by moderating price and availability. They praised the UK efforts and said that the alcohol industry will be removing 8 billion grams of alcohol from the market by 2015 by incentivizing the sale of products with a lower alcohol concentration through lowering taxes on these items.<sup>138</sup>

**Israeli implementation**

This strategy should be evaluated to assess the public health impact of the differential taxation. If the results are favorable, this policy option should be considered in Israel as well.

## Appendices

### Appendix 1: Alcohol use screening tools

Screening tool	Type of population	Objective of screening	Translated into Hebrew	Sensitivity (%)	Specificity (%)
AUDIT <sup>10</sup>	General	Detect alcohol misuse, abuse or dependence	Yes	51-97	78-96
CAGE <sup>10</sup>	General	Detect alcohol abuse or dependence	Yes	43-94	70-97
TWEAK <sup>10</sup>	Pregnant women	Detect alcohol misuse	No	59-87	72-94
CRAFFT <sup>10</sup>	Adolescents	Detect high risk alcohol and other drug use disorders simultaneously	Yes	92	64
FAST <sup>139</sup>	General	Detect alcohol misuse and identify hazardous drinkers	No	88-97	82-95

## Appendix 2: Alcohol use among youth from the Health Behavior in School-aged Children survey data (HBSC)

**Note:** These tables complement those present in the main body of the chapter.

The data were derived from the 2001/2002 and the 2005/2006 HBSC surveys.<sup>140, 141</sup> Weekly drinking was defined as reportedly consuming alcohol once per week or more frequently. Self-reported drunkenness was used as a measure of excessive alcohol use.

The tables from 2001/2002 include data from 35 HBSC countries. The tables from 2005/6 include data from 40 HBSC countries. The HBSC data in both studies was ranked in descending order (i.e., those ranked 1<sup>st</sup> had the highest percentage in their category). Rank indicates the relative order of Israeli youth with respect to youth in the 35-40 countries surveyed.

**Table A2-1: Youth consuming alcoholic beverages at least once weekly, 2001/2**

Age (years)	Boys (%)	HBSC Multi-country Avg. (%)	Int'l Rank	Girls (%)	HBSC Multi-country Avg. (%)	Int'l Rank
11	18	7.3	2 <sup>nd</sup>	8.5	3	1 <sup>st</sup> (tied with Italy)
13	20	15.3	7 <sup>th</sup>	9.8	9.2	9 <sup>th</sup>
15	24.5	34.3	26 <sup>nd</sup>	12.9	23.9	28 <sup>th</sup>

**Table A2-2: Youth consuming alcoholic beverages at least once weekly, 2005/2006**

Age (years)	Boys (%)	HBSC Multi-country Avg. (%)	Int'l Rank	Girls (%)	HBSC Multi-country Avg. (%)	Int'l Rank
11	19	7	2 <sup>nd</sup>	8	3	4 <sup>th</sup>
13	20	13	15 <sup>th</sup>	8	9	15 <sup>th</sup> (tied with Lithuania, Estonia, France)
15	22	31	32 <sup>nd</sup>	11	21	33 <sup>rd</sup> (tied with Iceland)

**Table A2-3: 15-year-olds who report first drunkenness at age 13 or younger, 2005/6**

Gender	First drunkenness at age 13 (%)	Rank	HBSC multi-country average (%)
Boys	8	39 <sup>th</sup>	17
Girls	3	38 <sup>th</sup> (tied with Macedonia and Italy)	13

**Table A2-4: Age at onset of drinking alcohol and at first episode of drunkenness (years), 15 year-olds, 2001/2**

Gender	Age at first drink (years)	HBSC average	Rank	Age at first episode of drunkenness (years)	HBSC average	Rank
<b>Boys</b>	13.1	12.3	34 <sup>th</sup> (tied with Greenland)	14.2	13.6	34 <sup>th</sup> (tied with Portugal)
<b>Girls</b>	13.8	12.9	35 <sup>th</sup>	14.7	13.9	35 <sup>th</sup>

**Table A2-5: Youth who have been drunk two or more times, 2001/2**

Age (years)	Boys (%)	HBSC multi-country average (%)	Rank	Girls (%)	HBSC multi-country average (%)	Rank
11	7.3	4.3	7 <sup>th</sup>	1.3	1.5	15 <sup>th</sup> (tied with Latvia, Croatia, and Greece)
13	11.3	14.5	27 <sup>th</sup>	4.5	9.7	32 <sup>nd</sup>
15	21.1	39.8	34 <sup>th</sup>	10.5	31.4	34 <sup>th</sup>

### Appendix 3: Further details on alcohol-related motor vehicle accidents

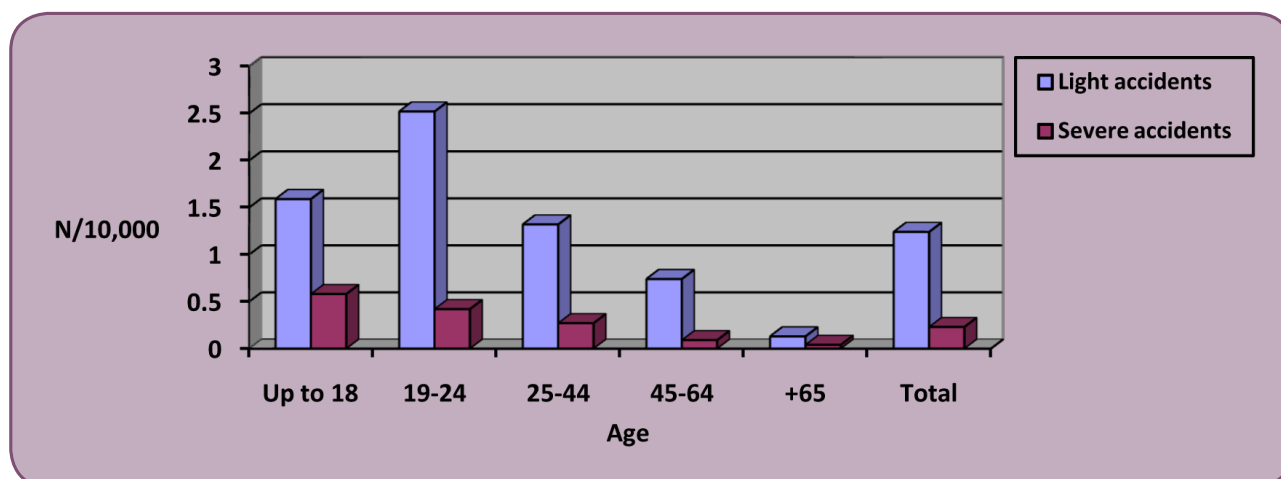
**Table A3-1: Drivers involved in MVAs while under the influence of alcohol, by type of accident and year of occurrence:**<sup>43</sup>

Type of MVA	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Involving one vehicle	23	26	33	30	36	18	48	49	40
Involving two moving vehicles	14	20	19	15	20	23	29	33	25
Pedestrian impact	6	2	3	4	4	7	10	9	11
Other	1	0	1	0	0	0	1	0	0

**Table A3-2: Number and percentage of MVA's while under the influence of alcohol and/or drugs, by day of the week and time of day, 2008:**<sup>43</sup>

Day of the week	MVAs in which the driver was under the influence of alcohol (%)	Time of day			
		00:00-05:59 (%)	06:00-11:59 (%)	12:00-17:59 (%)	18:00-23:59 (%)
Sunday	58 (1)	27 (8)	2 (0.1)	7 (0.3)	22 (2)
Monday	35 (1)	17 (7)	6 (0.4)	5 (0.3)	7 (1)
Tuesday	48 (1)	21 (8)	6 (0.4)	5 (0.3)	16 (1)
Wednesday	50 (1)	27 (12)	1 (0.1)	2 (0.1)	20 (2)
Thursday	54 (1)	21 (7)	7 (0.5)	9 (0.4)	17 (1)
Friday	110 (3)	60 (10)	11 (1)	17 (1)	22 (3)
Saturday	128 (4)	65 (13)	21 (5)	14 (1)	28 (3)
<b>Total</b>	<b>483 (2)</b>	<b>238 (10)</b>	<b>54 (1)</b>	<b>59 (0.5)</b>	<b>132 (2)</b>

**Figure A3-1: Drivers involved in MVAs while under the influence of alcohol and/or drugs, by age (per 10,000 drivers), 2008**<sup>43</sup>



## Appendix 4: Healthy People 2020 – Substance Abuse Objectives

### Policy and Prevention

#### SA-1 Reduce the proportion of adolescents who report that they rode, during the previous 30 days, with a driver who had been drinking alcohol

<b>Baseline:</b>	28.3 percent of students in grades 9 through 12 reported that they rode, during the previous 30 days, with a driver who had been drinking alcohol in 2009
<b>Target:</b>	25.5%
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Youth Risk Behavior Surveillance System (YRBSS), CDC, NCCDPHP

#### SA-2 Increase the proportion of adolescents never using substances

##### SA-2.1 Increase the proportion of at-risk adolescents aged 12 to 17 years who, in the past year, refrained from using alcohol for the first time

<b>Baseline:</b>	85.8 percent of adolescents aged 12 to 17 years who had never used alcohol in their lives, refrained from using alcohol for the first time in 2008
<b>Target:</b>	94.4 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

##### SA-2.3 Increase the proportion of high school seniors never using substances – Alcoholic beverages

<b>Baseline:</b>	27.7 percent of high school seniors reported never using alcoholic beverages in 2009
<b>Target:</b>	30.5 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Monitoring the Future Survey (MTF), NIH

#### SA-3 Increase the proportion of adolescents who disapprove of substance abuse

##### SA-3.1 Increase the proportion of adolescents who disapprove of having one or two alcoholic drinks nearly every day – 8th graders

<b>Baseline:</b>	78.5 percent of 8th graders reported that they disapproved of people having one or two alcoholic drinks nearly every day in 2009
<b>Target:</b>	86.4 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Monitoring the Future Survey (MTF), NIH

**SA-3.2 Increase the proportion of adolescents who disapprove of having one or two alcoholic drinks nearly every day – 10th graders**

<b>Baseline:</b>	77.6 percent of 10th graders reported that they disapproved of people having one or two alcoholic drinks nearly every day in 2009
<b>Target:</b>	85.4 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Monitoring the Future Survey (MTF), NIH

**SA-3.3 Increase the proportion of adolescents who disapprove of having one or two alcoholic drinks nearly every day – 12th graders**

<b>Baseline:</b>	70.5 percent of 12th graders reported that they disapproved of people having one or two alcoholic drinks nearly every day in 2009
<b>Target:</b>	77.6 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Monitoring the Future Survey (MTF), NIH

**SA-4 Increase the proportion of adolescents who perceive great risk associated with substance abuse****SA-4.1 Increase the proportion of adolescents aged 12 to 17 years perceiving great risk associated with substance abuse: consuming five or more alcoholic drinks at a single occasion once or twice a week**

<b>Baseline:</b>	40.5 percent of adolescents aged 12 to 17 years reported that they perceived great risk associated with consuming five or more alcoholic drinks at a single occasion once or twice a week in 2008
<b>Target:</b>	44.6 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-6 Increase the number of States with mandatory ignition interlock laws for first and repeat impaired driving offenders in the United States**

<b>Baseline:</b>	13 States had mandatory ignition interlock laws for first and repeat impaired driving offenders in 2009
<b>Target:</b>	51 (50 States and the District of Columbia)
<b>Target-Setting Method:</b>	Total coverage
<b>Data Source:</b>	Mothers Against Drunk Driving (MADD)

**Screening and Treatment**

**SA-8 Increase the proportion of persons who need alcohol and/or illicit drug treatment and received specialty treatment for abuse or dependence in the past year**

**SA-8.2 Alcohol and/or illicit drug treatment**

<b>Baseline:</b>	9.9 percent of persons aged 12 years and older who needed alcohol treatment and/or illicit drug treatment reported that they received specialty treatment for abuse or dependence in the past year in 2008
<b>Target:</b>	10.9 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-8.3 Alcohol abuse or dependence treatment**

<b>Baseline:</b>	8.2 percent of persons aged 12 years and older who needed alcohol treatment reported that they received specialty treatment for abuse or dependence in the past year in 2008
<b>Target:</b>	9.0 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-9 (Developmental) Increase the proportion of persons who are referred for follow-up care for alcohol problems, drug problems after diagnosis, or treatment for one of these conditions in a hospital emergency department**

<b>Potential Data Source:</b>	National Hospital Ambulatory Medical Care Survey (NHAMCS), CDC, NCHS
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**SA-10 Increase the number of Level I and Level II trauma centers and primary care settings that implement evidence-based alcohol Screening and Brief Intervention (SBI)**

<b>Baseline:</b>	325 Level I and Level II trauma centers met the criteria for implementing evidence-based alcohol Screening and Brief Intervention in 2009
<b>Target:</b>	358 Level I and Level II trauma centers
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Trauma Verification Registry, American College of Surgeons

**Epidemiology and Surveillance**

**SA-11 Reduce cirrhosis deaths**

<b>Baseline:</b>	9.1 cirrhosis deaths per 100,000 population occurred in 2007 (age adjusted per 100,000 standard population)
<b>Target:</b>	8.2 deaths per 100,000 population
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Vital Statistics System (NVSS), CDC, NCHS

**SA-13 Reduce past-month use of illicit substances****SA-13.1 Reduce the proportion of adolescents reporting use of alcohol or any illicit drugs during the past 30 days**

<b>Baseline:</b>	18.3 percent of adolescents aged 12 to 17 years reported use of alcohol or any illicit drugs during the past 30 days in 2008
<b>Target:</b>	16.5 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-14 Reduce the proportion of persons engaging in binge drinking of alcoholic beverages****SA-14.1 Reduce the proportion of students engaging in binge drinking during the past 2 weeks – High school seniors**

<b>Baseline:</b>	25.2 percent of high school seniors reported that they engaged in binge drinking during the past 2 weeks in 2009
<b>Target:</b>	22.7 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Monitoring the Future Survey (MTF), NIH

**SA-14.2 Reduce the proportion of students engaging in binge drinking during the past 2 weeks – College students**

<b>Baseline:</b>	40 percent of college students reported that they engaged in binge drinking during the past 2 weeks in 2008
<b>Target:</b>	36 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Monitoring the Future Survey (MTF), NIH

**SA-14.3 Reduce the proportion of persons engaging in binge drinking during the past month – Adults aged 18 years and older**

<b>Baseline:</b>	27 percent of adults aged 18 years and older reported that they engaged in binge drinking during the past month in 2008
<b>Target:</b>	24.3 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-14.4 Reduce the proportion of persons engaging in binge drinking during the past month- Adolescents aged 12 to 17 years**

<b>Baseline:</b>	9.4 percent of adolescents aged 12 to 17 years reported that they engaged in binge drinking during the past month in 2008
<b>Target:</b>	8.5 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-15 Reduce the proportion of adults who drank excessively in the previous 30 days**

<b>Baseline:</b>	28.1 percent of adults aged 18 years and older reported that they drank excessively in the previous 30 days in 2008
<b>Target:</b>	25.3 percent
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	National Survey on Drug Use and Health (NSDUH), SAMHSA

**SA-16 Reduce average annual alcohol consumption**

<b>Baseline:</b>	2.3 gallons of ethanol per person aged 14 years and older were consumed in 2007
<b>Target:</b>	2.1 gallons
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Alcohol Epidemiologic Data System (AEDS), NIH

**SA-17 Decrease the rate of alcohol-impaired driving (.08+ blood alcohol content [BAC]) fatalities**

<b>Baseline:</b>	0.40 deaths per 100 million vehicle miles traveled involved a driver or motorcycle rider with a BAC of .08 or greater in 2008
<b>Target:</b>	0.38 deaths per 100 million vehicle miles traveled
<b>Target-Setting Method:</b>	5 percent improvement
<b>Data Source:</b>	Analysis Reporting System (FARS), DOT

**SA-20 Decrease the number of deaths attributable to alcohol**

<b>Baseline:</b>	79,646 deaths attributable to the harmful effects of excessive alcohol use occurred in 2001–05 (average annual number)
<b>Target:</b>	71,681 deaths
<b>Target-Setting Method:</b>	10 percent improvement
<b>Data Source:</b>	Alcohol-Related Disease Impact (ARDI) System, CDC

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