overview

Health-related consequences of problem alcohol use

6

Improving people's health through research and information

HRB
Health Research Board

overview

Health-related consequences of problem alcohol use

6

Deirdre Mongan
Siobhán Reynolds
Sarah Fanagan
Jean Long

Health Research Board

Please use the following citation:
Mongan D, Reynolds S, Fanagan S and Long J (2007) Health-related consequences of problem alcohol use. Overview 6. Dublin: Health Research Board.

Published by:
Health Research Board, Dublin

ISSN 1649-7198

Copies of this publication can be obtained from:
Administrative Assistant
Alcohol and Drug Research Unit
Health Research Board
Knockmaun House
42–47 Lower Mount Street
Dublin 2
t (01) 2354 127
f (01) 6618 567
e dmrd@hrb.ie

An electronic copy is available at:
www.hrb.ie/ndc

Copies are retained in:
National Documentation Centre on Drug Use
Health Research Board
Knockmaun House
42–47 Lower Mount Street
Dublin 2, Ireland
t (01) 2345 175
e ndc@hrb.ie

About the HRB

The Health Research Board (HRB) is the lead agency supporting and funding health research in Ireland. We also have a core role in maintaining health information systems and conducting research linked to national health priorities. Our aim is to improve people's health, build health research capacity, underpin developments in service delivery and make a significant contribution to Ireland's knowledge economy.

Our information systems

The HRB is responsible for managing five national information systems. These systems ensure that valid and reliable data are available for analysis, dissemination and service planning. Data from these systems are used to inform policy and practice in the areas of alcohol and drug use, disability and mental health.

Our research activity

The main subjects of HRB in-house research are alcohol and drug use, child health, disability and mental health. The research that we do provides evidence for changes in the approach to service delivery. It also identifies additional resources required to support people who need services for problem alcohol and drug use, mental health conditions and intellectual, physical and sensory disabilities.

The **HRB Overview series** reviews specific health or social issues in the areas of problem alcohol and drug use, child health, disability and mental health.

The **Alcohol and Drug Research Unit** is a multi-disciplinary team of researchers and information specialists who provide objective, reliable and comparable information on the drug situation, its consequences and responses in Ireland. The ADRU maintains two national drug-related information systems and is the Irish national focal point for the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). The unit also manages the National Documentation Centre on Drug Use. Through its activities, the ADRU aims to inform policy and practice in relation to problem alcohol and drug use.

Acknowledgements

The authors would like to express sincere thanks to all those who contributed to this publication. A number of data sources were used in compiling this Overview. Thanks are due to Professor Miriam Wiley, Ms Deirdre Murphy, Ms Fionnola Kelly and Ms Jacqueline O'Reilly of the Economic and Social Research Institute for providing HIPE data. We also thank Mr Joseph Keating, Central Statistics Office, for providing GMR data and Ms Antoinette Daly, Health Research Board, for providing NPIRS data. We thank the treatment service providers who provide information to the NDTRS.

We thank Dr Ann Hope and Dr Bobby Smyth for their helpful comments on an earlier draft of this paper.

Finally, we would also like to thank our colleagues in ADRU for all their assistance, in particular Ms Joan Moore for editing the work and the staff in the National Documentation Centre on Drug Use.

Overview series publication to date

Long J, Lynn E and Keating J (2005) *Drug-related deaths in Ireland, 1990–2002*. Overview 1. Dublin: Health Research Board.

Connolly J (2005) *The illicit drug market in Ireland.* Overview 2. Dublin: Health Research Board.

Connolly J (2006) *Drugs and crime in Ireland.* Overview 3. Dublin: Health Research Board.

Long J (2006) *Blood-borne viral infections among injecting drug users in Ireland 1995 to 2005.*

Overview 4. Dublin: Health Research Board.

Keane M (2007) *Social reintegration as a response to drug use in Ireland.* Overview 5. Dublin: Health Research Board.

Mongan D, Reynolds S, Fanagan S and Long J (2007) *Health-related consequences of problem alcohol use*. Overview 6. Dublin: Health Research Board.

Contents

List of tables and figures

Tables

Figures

List of abbreviations

ADRU	Alcohol and Drug Research Unit
AUDIT	Alcohol Use Disorders Identification Test
BAC	Blood Alcohol Concentration
CLAN	College Lifestyle and Attitudinal National survey
CSO	Central Statistics Office
ECAS	European Comparative Alcohol Study
ESPAD	European School Survey Project on Alcohol and other Drugs
FAS	Fetal Alcohol Syndrome
FASD	Fetal Alcohol Spectrum Disorders
GMR	General Mortality Register
HBSC	Health Behaviour in School-Aged Children
HIPE	Hospital In-Patient Enquiry scheme
HRB	Health Research Board
HSE	Health Service Executive
ICD	International Classification of Disease
NACD	National Advisory Committee on Drugs
NDTRS	National Drug Treatment Reporting System
NPIRS	National Psychiatric In-patient Reporting System
SLAN	Survey of Lifestyles Attitudes and Nutrition
WHO	World Health Organization

Glossary of terms

In Ireland, **a standard drink** contains 10 grams of pure alcohol. This corresponds to a half pint of beer or a single measure of spirits or a small glass of wine (100ml). The amount of pure alcohol in a standard drink differs between countries; for example, in the USA a standard drink contains 12 grams of alcohol, while in the UK a standard drink contains just 8 grams of alcohol.

The **recommended weekly limit** for alcohol is 21 standard drinks for men and 14 standard drinks for women, and this is a general guide for low-risk drinking. These drinks should be spread out over the course of the week, with at least 2–3 alcohol-free days.

Moderate drinking may be defined as drinking that does not cause harm to the drinker or to society. Drinking in moderation is defined as having no more than two drinks per day for men and no more than one drink per day for women.

Hazardous drinking is defined by the WHO as a pattern of alcohol use that increases the risk of harmful consequences for the user. The term describes drinking over the recommended limits by a person with no apparent alcohol-related health problems.

Harmful drinking can be described as a pattern of use which is already causing damage to health. This damage may be physical or mental.

Alcohol dependence can be said to exist in a person experiencing three or more of the following in a 12-month period:

- Strong desire or sense of compulsion to take the substance
- Impaired capacity to control substance-taking behaviour in terms of onset, termination, or levels of use
- Physiological withdrawal state when substance use is reduced or stopped, or use of the substance to relieve or avoid withdrawal symptoms
- Evidence of tolerance to the effects of the substance
- Other pleasures or interests being given up or reduced because of the substance use
- Persistent substance use despite clear evidence of harmful consequences

Years of life lost (YLL) is a measure of the years of life lost due to premature mortality.

Disability adjusted life years (DALYs) is a composite health summary measure that combines years of life lost due to premature death with years of life lost due to imperfect health and disability. This measure is often used to calculate the burden of disease that is attributable to alcohol consumption.

Binge drinking can be difficult to define but, in simple terms, it can be described as drinking a large quantity of alcohol in a short period of time, usually with the specific aim of getting drunk. In Ireland, the Health Promotion Unit defines binge drinking as consuming seven or more drinks per drinking occasion for men and consuming five or more drinks per drinking occasion for women.

1 Summary

The purpose of this Overview is to compile and analyse the available data on problem alcohol use in Ireland and its health-related consequences. This will help determine what approaches are likely to be effective in reducing alcohol-related harm in Ireland, and identify gaps in current knowledge so as to inform future research needs in this area.

Alcohol use in the general population in Ireland and among specific sub groups is described using published literature. Alcohol-related morbidity and mortality between 1995 and 2004 is analysed using previously unpublished data from the Economic and Social Research Institute and the Central Statistics Office. Alcohol treatment in Ireland from 2004 to 2005 is also described, using data from the Health Research Board.

Alcohol is a drug which has important pharmacological and toxic effects both on the mind and on almost every organ and system in the human body. In 2006, the average consumption per person aged 15 years or over in Ireland was 13.36 litres of pure alcohol. Although this has decreased from a peak of 14.3 litres in 2001, Ireland consumes more alcohol than most of its European counterparts. Interestingly, Ireland has a higher percentage of abstainers than other countries, implying that those who do drink consume alcohol in greater quantities than drinkers in other countries.

As well as being among the highest alcohol consumers in Europe, people in Ireland engage in drinking patterns that are excessive and problematic, with heavy and binge drinking now the norm for a substantial number of people. A 2007 study reported that 54% of Irish respondents binge drank at least once weekly, compared to 28% of Europeans. This pattern of drinking is not confined to adults in Ireland. A 2003 report of school-goers in 35 European countries found that 15–16-year-old students in Ireland had the highest frequency of binge drinking. It appears that alcohol is easily available, accessible and affordable for young people.

Young women are particularly vulnerable to the physical consequences of alcohol use. Because of intrinsic physical differences, the same level of alcohol is more harmful for women than for men. In recent years a binge drinking culture has emerged among women and drunkenness has increasingly become socially accepted. The consequences of this change in drinking patterns can be observed in hospital discharges. While women account for just a quarter of all alcohol-related discharges, among those aged 17 or under the proportion of female discharges is much higher, at 47%. As women develop alcohol-related health complications earlier in their drinking career than men, it is likely that, if current trends continue, we will see significantly higher numbers of middle-aged women experiencing alcohol-related morbidity or at greater risk of premature mortality. In spite of the increase in alcohol consumption and hospital discharges among women, it is important to remember that men continue to drink more and to suffer more alcohol-related health consequences than women.

Alcohol is a teratogen, and heavy maternal alcohol use during pregnancy can lead to fetal alcohol syndrome. Even low levels of prenatal alcohol exposure can lead to later behavioural and cognitive deficits. It can now be assumed that no level of alcohol consumption is known to be safe in pregnancy and, given that 60% of women report drinking during pregnancy, it is important that complete abstinence from alcohol during pregnancy is promoted.

While the pleasures of alcohol include possible benefits to health, particularly in relation to coronary heart disease and improvements in sociability, its pains are numerous and diverse. Alcohol-related hospital discharges increased by 92% between 1995 and 2004, and in 2004 amounted to 117,373 bed days or 2.9% of all bed days that year. There were large increases in the number of discharges with acute and chronic conditions, but the largest increase was observed among discharges with alcohol-related liver disease, which increased by 147% between 1995 and 2004. Alcohol-related mortality also increased during the same time period, with an incidence of 7.1 deaths per 100,000 adult population in 2004, compared to 3.8 in 1995. Half of all alcohol-related deaths occurred to people aged between 50 and 70 years. Alcohol is also implicated in fatal road traffic accidents. In 2003, alcohol was found to be a contributory factor in 36% of road fatalities. More encouragingly, the introduction of random breath testing appears to have had an immediate and positive impact. In the 12 months following its introduction in July 2006, there were 20% fewer fatalities than in the corresponding period in 2005/6.

Ireland has a number of alcohol policies, but none has been implemented consistently. The existing national alcohol policy was established as long ago as 1996 by the Department of Health, but has been largely ignored and consequently has had little success. Some policies actually contradict each other. Since 2000 the Strategic Task Force on Alcohol and the Commission on Liquor Licensing have published a number of policy documents with differing aims and perspectives. The Strategic Task Force had a strong public health approach and its main brief was to recommend evidence-based measures to prevent and reduce alcohol-related harm in Ireland. In comparison, the Commission focused on the licensing system in Ireland and the regulation and sale of alcohol and paid little attention to the social and health consequences of alcohol use. It consisted predominantly of people involved in the licensing trade. There now appears to be a pressing need for the implementation of an integrated alcohol strategy, but this will require strong leadership and political will.

In 2005, 5,527 people received treatment for problem alcohol use, according to the NDTRS. In addition, there were 2,995 admissions to psychiatric units or hospitals for alcohol-related conditions. As coverage by the NDTRS of alcohol-treatment agencies is as yet incomplete, it can be reliably assumed that the actual number of people receiving treatment for problem alcohol use is much higher. The average annual incidence of treatment seeking per 10,000 of the 15–64-year-old population as reported to the NDTRS for 2004–2005 was 10.4. Polydrug use is also a considerable problem and is most prevalent among young people. One in five people receiving treatment for alcohol use reported problem use of at least one other additional drug.

There are a number of areas where further research is required. It is important that surveys of the general population, as well as of specific groups, are repeated in a systematic fashion in order to monitor any changes in levels of alcohol consumption and drinking patterns. Brief intervention has been shown to be effective in reducing drinking to moderate levels of consumption in people with harmful or hazardous drinking patterns. In Ireland, this has been demonstrated in general practice, but its efficacy in other settings, including accident and emergency and outpatient settings, has yet to be evaluated. Detecting problem alcohol use early can help prevent the development of alcohol dependence and is cost effective because it obviates the need for more intensive, specialised treatments.

2 Alcohol use in Ireland

2.1 Introduction

Alcohol is widely used and enjoyed in Irish society. It is associated with many aspects of Irish social and cultural life and its use has become deeply woven into our national identity. Alcohol use accompanies many life events and rites of passage; christenings, first communions and weddings are often celebrated with alcohol, and alcohol is often part of the ritual of wakes and funerals. Drinking alcohol can be a highly pleasurable activity; the desire for its positive, short-term effects, including increased enjoyment, euphoria and the general expression of positive mood, is probably what motivates most people to drink in the first place. Alcohol has traditionally been recommended by medical practitioners for alleviating pain, for stress relief, and for an array of minor ailments. More recently, the alleged health benefits of alcohol have become the focus of greater scientific scrutiny. It is now widely accepted that low alcohol consumption (fewer than two drinks per day) is associated with lower coronary heart disease incidence and mortality in middle aged and older adults.

Against this backdrop, however, it is important to remember that alcohol is no ordinary commodity – it is a toxic substance, it is an intoxicant and it is also a drug of dependence. Alcohol is implicated in numerous premature deaths every year from disease, accidents and violence. It has been shown to be causally related to more than 60 different medical conditions. Overall, 4% of the global burden of disease is attributable to alcohol, and it is the third leading cause of death and disability in developed countries, after tobacco and hypertension (WHO 2002). The negative consequences of alcohol include harm to physical health, psychological well-being and relationships. These consequences impact on all facets of society, from the affected individuals and their families to the medical, social and legal resources of the state.

The past decade in Ireland has been characterised by unprecedented economic growth and prosperity. This has coincided with an unparalleled increase in alcohol consumption, and drinking patterns that have become highly problematic. It has become increasingly apparent that alcohol is the nation's favourite drug; however, its use and related harm is now a major public health problem.

This chapter describes the current situation regarding alcohol consumption in Ireland using data from published sources.

2.2 Alcohol consumption in Ireland

Ireland now has one of the highest levels of alcohol consumption in the European Union (EU). People in Ireland consumed 10.6 litres of pure alcohol per person in 2003. The EU average consumption was 9.1 litres and ranged from 5.0 in Bulgaria to 14.6 in Luxembourg (Figure 2.1). These figures were obtained from the World Health Organization (WHO) Global Alcohol Database which provides a global epidemiological surveillance of alcohol use and its related problems. Irish figures were calculated using data from the Revenue Commissioners and the Central Statistics Office (CSO).

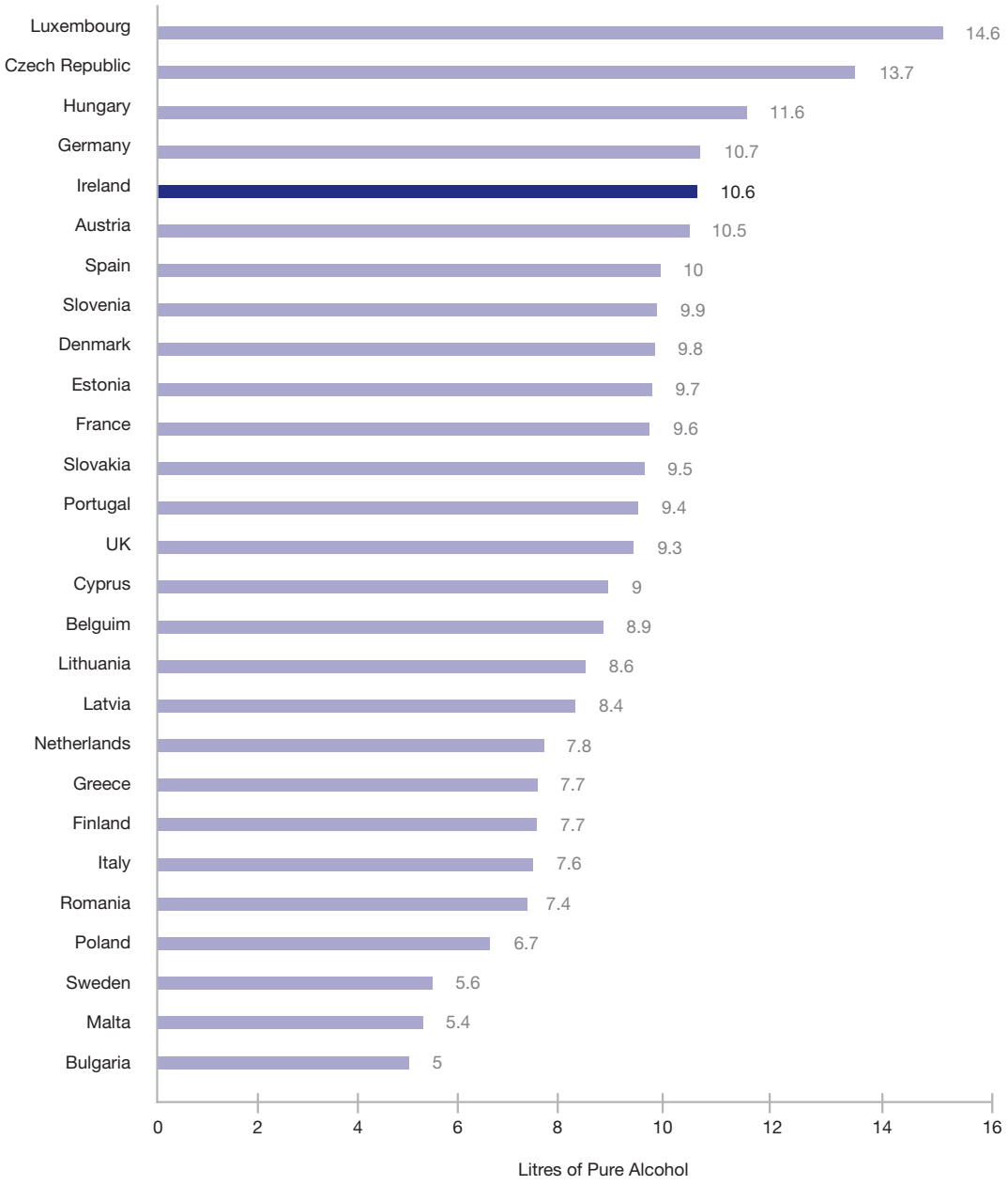
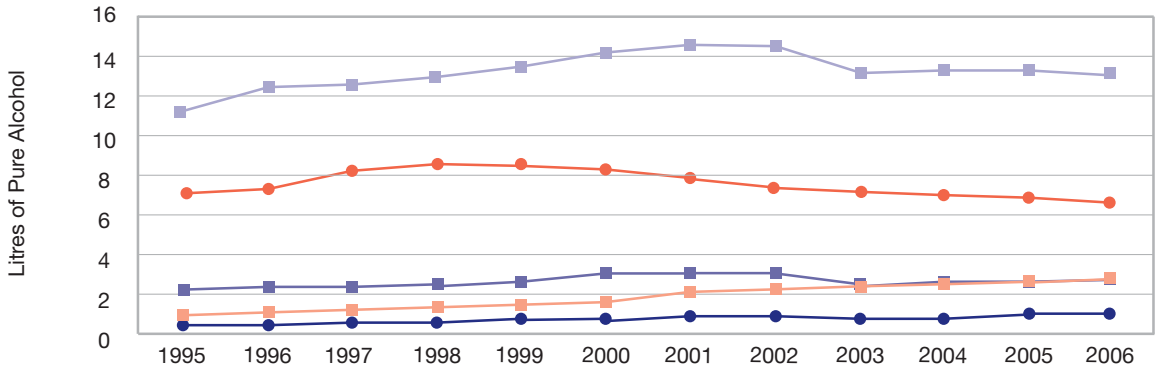


Figure 2.1 Alcohol consumption per capita in the European Union, 2003

Source: WHO, *Health for all Database,* accessed January 2007

A more accurate reflection of alcohol consumption at a population level is the rate of consumption of alcohol per person aged 15 years or over, given that 21% of the Irish population are under 15 years of age (defined as 'adult' for the purposes of this section). A cut-off of 15 years is used because, for the most part, those under 15 years do not drink alcohol, while drinking is increasingly prevalent among 15–18-year-olds. In 2006 the average rate of consumption of pure alcohol per adult in Ireland was 13.36 litres. This compares to a rate of 11.38 litres in 1995 and represents an increase of 17%. Alcohol consumption peaked in 2001 at 14.3 litres of pure alcohol per adult, but decreased in 2003 to 13.35 litres. This decrease is attributable mainly to an increase in excise duty on spirits in the December 2002 budget. Since 2003 the level of alcohol consumption has remained static (Figure 2.2).



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Beer	7.58	7.89	8.04	8.22	8.25	8.05	7.93	7.71	7.39	7.19	7.04	6.83
Spirits	2.12	2.30	2.37	2.44	2.75	3.04	3.08	3.17	2.49	2.51	2.51	2.57
Wine	1.06	1.26	1.34	1.53	1.72	1.87	2.06	2.27	2.41	2.71	2.75	2.87
Cider	0.63	0.69	0.77	0.87	1.00	1.13	1.23	1.07	1.06	1.06	1.09	1.09
Total	11.38	12.14	12.53	13.06	13.72	14.09	14.30	14.22	13.35	13.48	13.40	13.36

Figure 2.2 Alcohol consumption by adults in Ireland, by type of drink, 1995–2006

Sources: Revenue Commissioners and CSO annual reports

Beer is the most widely consumed alcoholic beverage in Ireland and accounted for 51% of all alcohol consumed in 2006. Although the market share of beer dropped from 67% in 1995 to 51% in 2006, Ireland has one of the highest levels of beer consumption per adult in the EU according to the WHO *Health for all Database*. In 2006, just less than seven litres of pure alcohol per adult were consumed as beer. Other noticeable trends in the type of drink consumed include the rise in popularity of wine, with an increase of 170% between 1995 and 2006, from 1.06 to 2.87 litres of pure alcohol per adult being consumed as wine. The consumption of spirits increased steadily between 1995 and 2002 (up by 49%) but decreased (by 21%) in 2003 following an increase in excise duty. A similar trend is noticeable for cider, with consumption increasing between 1995 and 2001. An increase in excise in December 2001 resulted in a 13% reduction in cider consumption in 2002.

2.3 Alcohol use in the general population

According to the WHO, Ireland has one of the highest levels of alcohol consumption in the EU. This is confirmed in a number of population surveys. The National Drinking Survey found that Ireland had the highest reported alcohol consumption among European countries studied in the European Comparative Alcohol Study (ECAS) (Ramstedt and Hope 2005). This study also found that, relative to other European countries, Ireland had the highest proportion of abstainers, with 23% of all 18–64-year-olds reporting they had not consumed alcohol in the previous year. Abstention is more prevalent among women than among men (25% vs. 20%) and among older age groups. The fact that the abstention rate in Ireland remains high contradicts the argument that higher consumption rates are explained by a reduction in abstention.

Both average per capita alcohol consumption and individual patterns of drinking are important determinants of alcohol-related problems. In general, increases in overall consumption are accompanied by a greater incidence of health and social problems. In addition to the high volume of alcohol consumed by people in Ireland in general, drinking occasions appear to be strongly related to episodic heavy or 'binge' drinking patterns. Binge drinking is associated with adverse health and social consequences, including accidents, suicide, violence and loss of productivity or absenteeism, which affect both the individuals who engage in it and those around them. Culture plays an important role in determining drinking patterns and attitudes. In Mediterranean countries, the drinking culture generally does not condone either binge drinking or drunkenness, whereas in other European countries, including Ireland, binge drinking is more readily tolerated and drunkenness is a common outcome of drinking occasions.

The SLAN survey of 2002 reported that 30% of men and 22% of women consumed more than the recommended weekly limits for alcohol (Kelleher *et al.* 2003). In a Eurobarometer survey published in 2007 and comprising 29 European countries, Ireland topped the country scale for heavy drinking by a considerable margin, with 34% usually consuming at least five drinks per drinking occasion. In comparison, just 10% of the EU population reported consuming five or more drinks in one sitting. Furthermore, when asked about the frequency of consuming five or more drinks on one occasion in the past year, 28% of Europeans stated they did so at least once a week, compared to 54% of respondents in Ireland, which was the highest recorded value (TNS Opinion & Social 2007).

According to the National Drinking Survey, the drinking population in Ireland had the lowest percentage of daily drinkers but the highest percentage of weekly binge drinkers, with 48% of men and 16% of women reporting binge drinking at least once weekly. In this study, binge drinking was the equivalent of consuming a bottle of wine or more (75+ grams of pure alcohol). Among men in Ireland, 58 of every 100 drinking events ended up in binge drinking; the corresponding figure for women in Ireland was 30 of every 100. This pattern of drinking is associated with acute adverse consequences, in particular among men. Men in Ireland reported 1.2 drink-related harmful consequences (out of a maximum of eight), which was nearly twice as high as the ECAS average. Those aged 18–29 were most likely to experience such consequences. Both men and women in Ireland showed higher rates than other ECAS countries with respect to 'regretted things said or done after drinking', 'getting into a fight', 'been in an accident', 'adversely affecting work or studies' and 'affecting friendships' (Figure 2.3). Chronic problems were less evident among respondents in Ireland, where both men and women scored lower than the ECAS average for 'experience of health problems' and were close to the ECAS average for 'feeling a need to cut down'. This may be attributed to a concentration of harm in younger age groups but, more worryingly, it also suggests that there is a risk for more long-term health problems in the future (Ramstedt and Hope 2005).

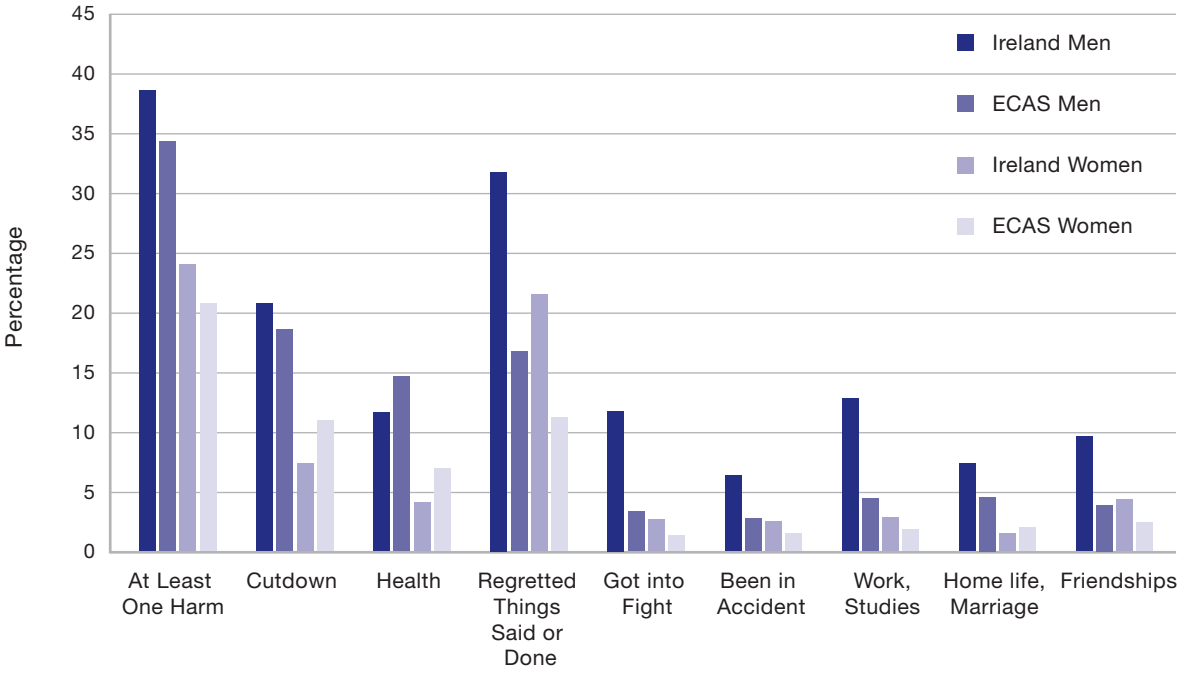


Figure 2.3 Alcohol-related adverse consequences experienced by people in Ireland

Source: Ramstedt and Hope (2005)

2.4 Alcohol use among young people

For young people in Ireland, alcohol is the drug of choice and the initiation of alcohol consumption typically occurs during adolescence. The CLAN survey in Ireland which studied college students with an average age of 21 years (Hope *et al.* 2005), found that the average age at onset of drinking was 15 years. The HBSC survey of 10–17 year olds (Kelleher *et al.* 2003) demonstrated that over 50% of Ireland's young people experimented with alcohol before the age of 12 and, of those aged 15–17, 54% of boys and 50% of girls were current drinkers (Nic Gabhainn cited in Strategic Task Force on Alcohol 2004). The most recent HBSC survey reported few changes between 2002 and 2006, with the proportion of children defined as current drinkers and the rate reporting having been 'really drunk' remaining stable. (Nic Gabhainn *et al.* 2007). The high rate of alcohol use among young people has been attributed to a number of factors, including increased affluence, loss of parental control and increased availability of and access to alcohol.

Young people's propensity for risk-taking and their relative inexperience with alcohol place them at particular risk for alcohol-related harm. Heavy drinking in adolescence is related to problem alcohol use in adulthood. People who begin drinking before the age of 15 are four times more likely to develop alcohol dependence at some time in their lives than those who have their first drink at age 20 or older (Grant *et al.* 1997). Because of the relative immaturity of the adolescent brain compared to that of an adult, excessive drinking is especially hazardous to young people. The American Medical Association (2002) reported that an adolescent need drink only half as much as an adult to experience the same negative effects, and even occasional binge drinking can damage the young

brain. Alcohol consumption during the adolescent years is associated with damage to the brain regions which are important for memory and learning capabilities as well as for decision making and reasoning. Damage to these brain regions can lead to neurocognitive deficits which can impair academic performance and negatively impact on the higher-order cognitive functions and impulse control which are necessary for successful progression to adulthood.

As well as experiencing the long-term adverse health effects of alcohol use, young people are prone to its acute consequences. The substantial involvement of alcohol in cases of suicide, road traffic accidents, homicides and poisonings is well-known and is especially marked among young people. Hazardous alcohol use is estimated to cause 31.5% of all deaths among 15–29-year-old men in the developed world and 86% of the 3.6 million substance-related deaths of 15–29-year-old men and women worldwide (Toumbourou *et al.* 2007).

Drinking to intoxication appears to be a key feature of the drinking habits of young people in Ireland. This has been confirmed in consecutive ESPAD reports (Hibell *et al.* 2000, 2004) which compared alcohol and drug use among 15–16-year-old students in 35 European countries. The 2004 report found that 32% of students in Ireland reported drinking five or more drinks in a row three times or more in the previous 30 days, which was the highest proportion recorded in any country (Table 2.1). It also reported that beer drinking was a predominantly male behaviour, while spirits and alcopops were the beverages of choice among females.

Table 2.1 Frequency of drinking five or more drinks in a row (number of occasions in the last 30 days)

	Number of occasions in the last 30 days				
No. of drinks	0	1–2	3–5	6–9	10+
Boys (%)	43	26	16	9	6
Girls (%)	43	24	18	9	6
Total (%)	**43**	**25**	**17**	**9**	**6**

Source: Hibell *et al.* (2004)

This pattern of drunkenness and binge drinking is not confined to second-level students. A recent international study of drinking among university students in 21 countries found that Ireland had the highest proportions of both male and female heavy or binge drinkers (Dantzer *et al.* 2006). Binge drinking was defined as drinking five or more drinks in a row for men, and four or more drinks for women, at least once in the previous two weeks. Forty-nine per cent of men and 57% of women were classified as heavy drinkers. Heavy drinking was associated with affluence and was more common among students who lived away from home, had wealthier family backgrounds and well educated parents. These findings were consistent with the CLAN survey which reported binge drinking at least once a week in 61% of male and 44% of female students in Ireland. The CLAN survey also investigated the occurrence of adverse consequences attributable to alcohol among this

cohort (Figure 2.4). Seventy-four per cent of male students and 65% of female students experienced at least one harm in the previous year arising from their own alcohol use. Regular binge drinkers, defined as those who engaged in binge drinking at least once weekly, were two to three times more likely to experience adverse consequences because of their drinking than students who were binge drinking less frequently, or were non-binge-drinkers.

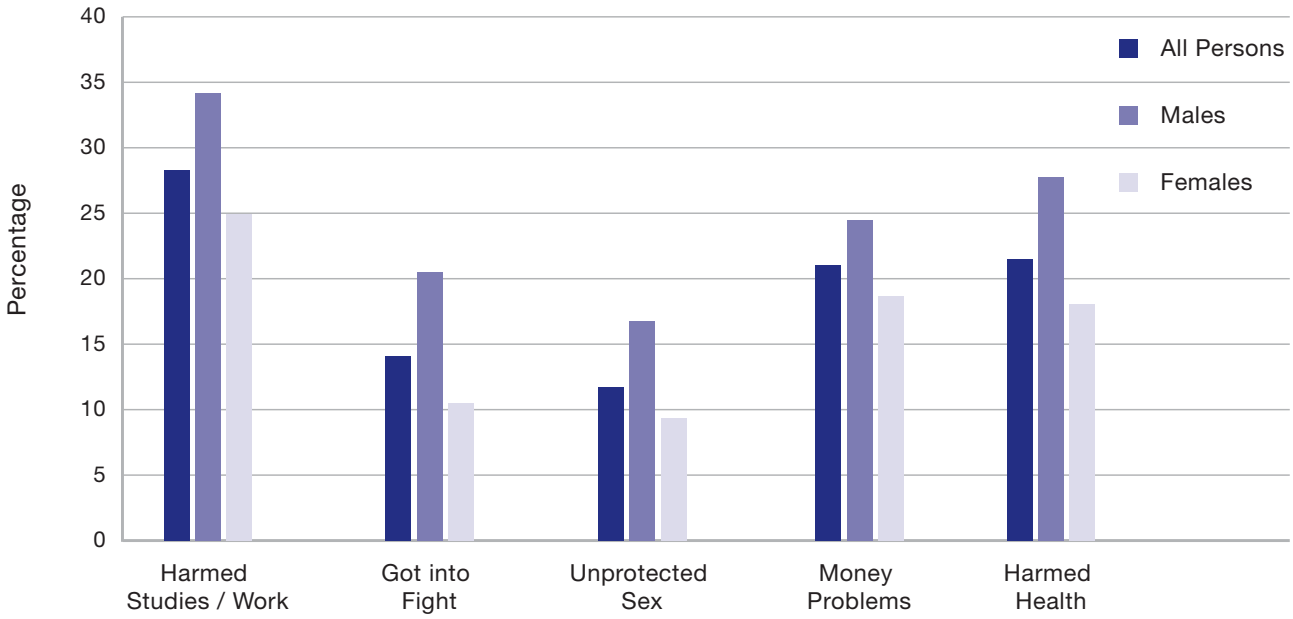


Figure 2.4 Experience of adverse consequences of own alcohol use in college students

Source: *Hope et al.* (2005)

Although the legal age for purchasing alcohol in Ireland is 18 years, it appears that teenagers have little difficulty in obtaining alcohol. This is corroborated in the ESPAD report of 2004, which states that 86% and 79% of students perceived the availability of beer and spirits respectively to be 'very easy' or 'fairly easy'. Thirty-six per cent of boys had purchased beer in a store for their own consumption in the previous 30 days, while 27% of girls had purchased spirits. Bearing in mind that this study's participants were either 15 or 16 years of age, these findings emphasise the ease of access to alcohol among young people.

The Intoxicating Liquor Act 2003 prohibits the purchase or delivery of alcohol to a person aged under 18 years on a licensed premises. It also requires that all those aged between 18 and 20 years carry identification to prove their age. The introduction of a National Age Card by the Garda Síochána in 1999 to ensure proof of age when purchasing alcohol appears to have had little or no effect in preventing underage drinkers procuring alcohol. In 2005 there were just 62 applications for closure orders against licensed premises for any reason, which would suggest that current measures to deter license holders from serving alcohol to underage drinkers are not sufficient.

This high level of alcohol consumption has been accompanied by a parallel increase in the incidence

of alcohol-related crime among juveniles (aged under 18 years). Between 2000 and 2005 there was a 135% increase in juvenile alcohol-related offences (An Garda Síochána annual reports). In 2005, 4,217 alcohol-related offences were committed by juveniles, accounting for 20% of all juvenile offences. Of these, 1,536 related to the purchase, possession or consumption of alcohol, while 2,628 pertained to intoxication in a public place. In 2000, the corresponding figure for alcohol-related crime was just 1,793 and comprised 12% of all juvenile offences.

2.5 Alcohol use among women

In most cultures women are less likely to drink than men. Women who drink consume alcohol less frequently, in smaller amounts and with lower risks of adverse consequences than male drinkers. Women metabolise alcohol differently from men and have higher blood alcohol concentrations for a given volume of alcohol consumed; therefore the risks associated with alcohol are often amplified for women. In part, this is due to the fact that women have a lower body weight than men, and have less body water and a higher percentage of body fat. Women also have lower levels of gastric alcohol dehydrogenase activity, which results in more alcohol entering the bloodstream unmetabolised and, in turn, higher blood alcohol concentrations. For equivalent doses of alcohol, women are more vulnerable than men to tissue damage and the onset of cirrhosis of the liver and physical alcohol dependence (Edwards *et al.* 2003; Hulse *et al.* 2002).

Alcohol consumption is associated with a linear increase in breast cancer incidence. Consumption of just one standard drink per day is associated with a 9% increase in the risk of developing breast cancer relative to non-drinkers, while consuming 3–6 standard drinks per day increases the risk of breast cancer to 41% (Smith-Warner *et al.* 1998). Chronic heavy drinking is also associated with a variety of menstrual and reproductive disorders, from irregular menstrual cycles to inhibition of ovulation and infertility. It is also a recognised risk factor for osteoporosis (Emanuele *et al.* 2002).

Prenatal alcohol exposure adversely affects the developing anatomical structures of the body and brain of the fetus, leading to a range of physical, cognitive and behavioural effects. Women who drink heavily during pregnancy also have increased rates of complication of pregnancy and delivery, and of spontaneous abortion and stillbirth (Kesmodel *et al.* 2002). 'Fetal Alcohol Spectrum Disorders' (FASD) is an umbrella term encompassing the range of effects that can occur in a child whose mother drank during pregnancy and includes the complete fetal alcohol syndrome (FAS), and fetal alcohol effects (FAE), which is also referred to as alcohol-related neurodevelopmental disorder (ARND). The most serious disorder within this spectrum is fetal alcohol syndrome (FAS), which can occur in infants of mothers who drank heavily during pregnancy. It is characterised by facial dysmorphism (flat mid-face, thin upper lip, small eye openings, short nose), short stature and central nervous system dysfunction. Individuals with FAE usually do not have facial effects, but may be characterised by the presence of disturbances in behavioural, emotional, and/or social functioning. There are no official statistics available for the prevalence of FAS in Ireland but the Centre for Disease Control in America estimates that the incidence of FAS in the US is 0.2–1.5 per 1,000 live births (CDC 2002). If these rates are

applied to births in Ireland, it can be postulated that between 123 and 925 babies are affected annually by this condition (based on 61,684 births in 2005).

More recently, attention has been paid to the effects of low levels of prenatal exposure to alcohol. A number of studies have found associations between low-level alcohol consumption in pregnancy and neurocognitive deficits in the child (Willford *et al.* 2006; Sayal *et al.* 2006; Streissguth and O'Malley 2000). A study of 501 mother-child pairs reported that children exposed to any level of alcohol, compared with those not exposed, showed 3.2 times greater odds of delinquent behaviour (Sood *et al.* 2001). This effect was observed at average levels of exposure of as low as one drink per week. Prenatal alcohol exposure is also significantly associated with alcohol-related problems in offspring at 21 years. A longitudinal study found that heavy episodic drinking during pregnancy, in contrast to all lower drinking exposure, triples the odds that an offspring at the age of 21 will show evidence of mild alcohol dependence (Baer *et al.* 2003). The incidence of FASD in Ireland is unknown but is probably higher than the incidence of FAS as it is more difficult to identify and diagnose and can occur at lower levels of alcohol consumption.

The fetus is susceptible to alcohol damage throughout gestation but is especially vulnerable to brain injury during specific stages of brain development. If a woman binge drinks during such a critical stage, significant harm may be inflicted on the developing fetal brain, even if average alcohol consumption is low throughout pregnancy. Prior to 2007 there were no official guidelines in Ireland regarding alcohol use during pregnancy. In September 2007 however, the Chief Medical Officer in the Department of Health and Children provided unambiguous advice in relation to alcohol consumption and pregnancy, stating: 'Given the harmful drinking patterns in Ireland and the propensity to "binge drink", there is a substantial risk of neurological damage to the fetus, resulting in Fetal Alcohol Spectrum Disorders (FASD). Alcohol offers no benefits to pregnancy outcomes. Therefore, it is in the child's best interest for a pregnant woman not to drink alcohol during pregnancy' (Department of Health and Children 2007).

A study of 120,000 pregnant women attending the Coombe Women's Hospital in Dublin between 1987 and 2006 found that 60% of the women consumed alcohol during their pregnancy and 7.1% reported drinking more than six units per week (Barry *et al.* 2007). Over two thirds of all pregnant women under the age of 18 reported drinking alcohol during their pregnancy, while the 18–24-year age group reported the highest percentage of those who drank over 10 units per week. From a health promotion viewpoint, this report highlights the importance of raising awareness and educating women about the risks of drinking alcohol during pregnancy. A study of postnatal women in the Rotunda Hospital in 2003 found that alcohol was consumed by 89% of the women, with 10% reporting binge drinking during pregnancy (McMillan *et al.* 2006). While 71% of smokers were aware of the risks of smoking, there was less awareness about the risks of alcohol consumption, with just 44% being aware of the risk. Brief intervention for alcohol use by pregnant women may be an effective strategy to reduce alcohol-related conditions in newborns. An American study which screened 4,980 women for alcohol use found that pregnant women who received brief intervention were five times more

likely to report abstinence after intervention than were women who were assessed only (O'Connor and Whaley 2007). Newborns whose mothers received brief intervention had higher birth weights and birth lengths, and three times lower fetal mortality rates, than newborns in the assessment-only group.

Alcohol use, and binge drinking in particular, is associated with risky behaviours, with women being especially vulnerable. A survey by the Crisis Pregnancy Agency which examined the explanations for non-use of contraception by those who did not want to become pregnant found that 45% of men and 26% of women agreed that drinking alcohol had contributed to their having sex without using contraception (Rundle *et al.* 2004). In 2005, the Sexual Assault Treatment Unit in the Rotunda Hospital reported 293 attendances, of which 277 were by females. More than four units of alcohol had been consumed by the victim in 60% of cases. In 31% of cases, the possibility of a sexual crime needed investigation because of the client's memory loss, mostly after ingestion of large amounts of alcohol. For 42 clients, the possible use of Rohypnol in a sexual assault was considered by either the client or the doctor. However, toxicology was not positive for Rohypnol in a single one of these cases, but there was a background of considerable alcohol intake in the majority.

In recent years it has become more socially acceptable for women to consume alcohol in greater volumes and in patterns mirroring those of their male counterparts. The ESPAD study showed that alcohol consumption among schoolgirls in Ireland increased dramatically between 1995 and 2003. In addition, the frequency of binge drinking and drunkenness among young girls also increased (Hibell *et al.* 2004). If these trends continue, there may be serious consequences for women's health as women are at higher risk of developing physical complications than men, and these complications manifest themselves earlier in their drinking careers.

2.6 Alcohol use among the elderly

Although much attention is focused on alcohol use among young people, alcohol use disorders in the elderly are common and are associated with significant impairments in physical, social, psychological and cognitive health. Older people become more susceptible to the effects of alcohol due to their decreased ability to break it down. Male gender, social isolation and being separated or divorced are socio-demographic factors associated with problem alcohol use in the elderly. It is generally accepted that the prevalence of problem alcohol use decreases with age, but rates may be under-estimated because of under-detection and misdiagnosis. (Johnson 2000). The clinical presentation of problem alcohol use in elderly people may differ from that in younger people, with elderly people more likely to present with non-specific complaints, including falls, depression and confusion, which may mask the underlying problem alcohol use. Furthermore, existing screening questionnaires may not be appropriate in the case of elderly people as they tend to focus on current drinking, even though an accurate assessment of lifetime alcohol consumption is necessary when screening elderly people. An Irish study of alcohol consumption in the elderly (aged over 65 years), revealed that 16% of elderly males and 2% of females reported excessive weekly alcohol consumption (Greene *et al.*

2003). Excess consumption was associated with male gender and widowed status.

2.7 Alcohol use among marginalised groups

The problems associated with alcohol use are more likely to present themselves in vulnerable groups, including the homeless, Travellers and prisoners. There is a long-standing relationship between alcohol use and homelessness. A study to measure the extent of alcohol and drug use among the homeless in four Irish cities in 2003 found that alcohol was the drug of choice in the homeless population and was the prime reason for 13% becoming homeless (Lawless and Corr 2005). Of the 247 (70%) who consumed alcohol, 23% drank at least four days per week. Screening by the AUDIT instrument found that 73% were drinking harmful or hazardous levels of alcohol, which represented 51% of the total homeless population. Men were more likely than women to have an alcohol problem (76% vs. 63%).

There is a dearth of literature regarding alcohol use among prisoners, both in Ireland and internationally, with illicit drug use being principally investigated. A study of mental illness in Irish prisoners found a lifetime prevalence of harmful alcohol use or dependence of 60% among remanded prisoners and a point prevalence of 35% (Linehan *et al.* 2005). The same study investigated alcohol use in female prisoners and found that 25% of remanded and sentenced women had a current alcohol dependence problem. Given the high level of problem alcohol use among prisoners, it is not surprising that 37% of male and 28% of female committals were found to require access to alcohol treatment services (Kennedy *et al.* 2005).

Minority ethnic groups are often associated with a high prevalence of alcohol and drug use. In Ireland, Travellers are widely acknowledged as one of the most marginalised and disadvantaged groups in society. The link between Travellers and problematic drug use is clearly acknowledged in the *National Drugs Strategy 2001–2008 and in Traveller health – a national strategy 2002–2005* (Department of Health and Children 2002), which recommends further research on alcohol use among Travellers. A report commissioned by the NACD (Fountain 2006) examined, by means of focus groups, the nature and extent of drug use among the Traveller community in Ireland. It found that alcohol use was widespread, especially among male Travellers. In addition, alcohol was sometimes used in combination with drugs, which exacerbated its negative effects. Unfortunately, there are no statistics available that record the prevalence of problem alcohol use among Travellers and further research on this group is needed. From 2007 onwards, the NDTRS forms will include a question on ethnicity which will enable accurate recording of Travellers receiving treatment for problem alcohol use.

2.8 Alcohol policy in Ireland

The main aims of alcohol policies are to minimise alcohol-related harm while recognising its benefits. Policies must balance individual freedom against the wellbeing and safety of society in general. In the past decade a number of policy reports relating to alcohol have been published by different agencies,

with varying degrees of impact. In 1996 the first National Alcohol Policy was published by the Department of Health on behalf of the government. This document aimed to reduce the prevalence of alcohol-related problems by promoting moderation among those who choose to drink, but appears to have made little or no discernible impact. This policy advocated environmental and individual measures to reduce alcohol-related problems in Ireland, including limiting availability and access to alcohol, taxation, and drink driving regulations, as well as strategies oriented to individual prevention and treatment. It also emphasised the necessity of commitment from different stakeholders across sectors for the successful instigation of this policy. Unfortunately, it appears that no proper strategies were put in place for its implementation and consequently it was largely ignored.

In 2002 the Minister for Health and Children established the Strategic Tack Force on Alcohol, whose brief was to recommend specific evidence-based measures to prevent and reduce alcohol-related harm in Ireland. This Task Force published reports in 2002 and 2004, at a time when it was reported that Irish people were the second-highest consumers of alcohol in the EU and that alcohol consumption had increased by 41% in the preceding decade. These reports provided a comprehensive review of the problems associated with alcohol use in Ireland and presented evidence-based strategies for the reduction of alcohol-related harm. The Task Force favoured policy measures that influenced and changed the physical, social and cultural environment around alcohol, rather than measures targeted only at the individual drinker. The second report put forward over 70 recommendations, including an increase in taxation, regulation of availability, tougher drink-driving measures and effective treatment services.

Between 2000 and 2003 the Commission on Liquor Licensing, established by the Minister for Justice, Equality and Law Reform, published four reports. The Commission's remit was 'to review the liquor licensing system and to make recommendations for a system geared to meeting the needs of consumers in a competitive market economy, while taking due account of the social, health and economic interests of a modern society'. The Commission was predominantly made up of people involved in aspects of the licensing trade and had very little public health input. Its main focus on problem alcohol use was concentrated on young people and promoted school-based educational programmes as a means of reducing alcohol consumption in this group. This contrasted with the approach of the Strategic Task Force on Alcohol, which recognised that alcohol is not a problem solely for young people but affects the whole population, and did not support information and education programmes as lead strategies for reducing alcohol consumption and harm, but rather as part of an overall, integrated, multi-faceted strategy.

In 2006 the EU published the report *Alcohol in Europe – a public health perspective* (Anderson and Baumberg 2006), which brought together all existing evidence to demonstrate which policy options work and which do not. As the EU does not have the powers to make policies for health, the introduction of an integrated European alcohol policy is not feasible, but this document may provide a platform for individual countries to establish polices. Policy measures identified that are considered effective include unrestricted breath testing, lowered blood alcohol concentration levels for drivers,

licence regulation, taxation and brief advice to heavy drinkers (for example in primary care settings). Measures that generally do not work well include designated driver campaigns and advertising self-regulation. This report acknowledges that, while education alone is ineffective in influencing drinking behaviour, it should be an important component of any alcohol policy to increase public awareness and secure popular support for the implementation of other alcohol-control measures.

A number of policy documents have influenced the development and provision of treatment services in Ireland. Traditionally, alcohol treatment has had a narrow focus, concentrating on 'alcoholics' or those with severe alcohol dependence but, since the publication of *Alcohol control policies in public health* (Bruun *et al.* 1975) which was sponsored by the WHO, a public health perspective has been supported which acknowledges that heavy drinking and alcoholism cannot be seen in isolation from the drinking culture in the population as a whole. The Irish national policy document on the development of the mental health services, *Planning for the future* (Department of Health 1984), reflected this change in viewpoint and advocated treating people with alcohol-related problems in community and outpatient units as an alternative to inpatient care. Since then, there has been a shift from inpatient to community settings for alcohol treatment and it is now recognised that psychiatric inpatient units are inappropriate for treating the majority of people with alcohol problems. This is mirrored in the recent mental health policy, *A vision for change*, which states that 'individuals whose primary problem is substance abuse and who do not have mental health problems will not fall within the remit of mental health services' (Expert Group on Mental Health Policy 2006: 147). In a departure from the international classification system, substance abuse (dependency) will no longer be included among the categories of mental health problems in Ireland. According to the Expert Group report, the major responsibility for the care of those with a diagnosis of substance abuse (dependence) lies outside the mental health services, and rests with separate services that have their own funding structure within Primary, Community and Continuing Care (PCCC) in the Health Service Executive. Historically, such funding was allocated for the care of those with drug dependence rather than alcohol dependence. The report does not clarify how the mental health services will reassign to the PCCC function the staff and finance currently used to address alcohol dependence in the mental health services (Long 2006).

A report by the Joint Oireachtas Committee on Arts, Sport, Tourism, Community, Rural and Gaeltacht Affairs (2006) recommended that alcohol should be included in a new national substance misuse strategy. Although the extent of the alcohol problem in Ireland has been highlighted ad nauseam, it remains the case that no structures exist to manage this problem. The National Drugs Strategy 2001–2008 was launched in 2001 by the Department of Community, Rural and Gaeltacht Affairs, which has responsibility for co-ordinating and overseeing its implementation. The strategy's overall objective is to reduce drug-related harm by focusing on the four pillars of supply reduction, prevention, treatment and rehabilitation, and research.

The justification for extending the National Drugs Strategy to include alcohol lies mainly in the areas of prevention and treatment. In practice, prevention programmes address licit and illicit

substances together. Prevention of drug use is associated with prevention of addictive behaviours involving both licit and illicit substances. The main objective of prevention programmes is to delay or prevent the introduction into the use of legal substances, as it is now recognised that the early use of licit substances is the most important risk factor for progression to illicit substance use. This is particularly evident among programmes targeting young people which focus first on alcohol and tobacco, as the longer that initiation to these substances is delayed, the greater the reduction in later substance abuse problems.

In some instances it has become necessary to extend treatment programmes to include both licit and illicit substances because of the increasing prevalence of polydrug use. Polydrug use presents challenges to drug monitoring systems that traditionally have focused on the use of individual substances. In Ireland there are no national official links between alcohol and drug treatment services but, in practice, many drug services also treat clients with problem alcohol use. The reason for this is that one-fifth of those treated for problem alcohol use also misuse drugs. An EMCDDA survey (2006) of policies in 27 European countries found that just eight countries have introduced policies that combine alcohol and drugs. Northern Ireland has adopted this approach and in 2006 launched a combined strategy, *New strategic direction for alcohol and drugs 2006–2011* (DHSSPS 2006). The overall aim of this strategy is 'to reduce the level of alcohol and drug-related harm in Northern Ireland'.

The possibility of developing a combined alcohol and drug strategy in Ireland is being examined. One of the recommendations of the steering group for the mid-term review of the National Drugs Strategy was that 'a working group involving key stakeholders of both the alcohol and drugs areas should be established to explore the potential for better co-ordination between the two areas and how synergies could be improved. The working group should also examine and make recommendations on whether a combined strategy is the appropriate way forward' (Steering Group 2005: 57). One of the main advantages of extending the existing drugs strategy is that it has a well-established policy framework and extending its agenda to incorporate alcohol would appear to be a more practical solution than the creation of another, separate alcohol policy. This view seems to be reflected in the approach of the regional drugs task forces, with the majority adopting strategies that address both alcohol and drug misuse, especially among younger people. The Department of Health and Children has set up a working group to identify synergies between the responses to alcohol and drugs. Whatever decision is made in relation to a national alcohol policy, it is imperative that resources are available for its enforcement and long-term implementation, otherwise its impact is likely to be negligible.

3 Data sources

3.1 Introduction

This Overview is based predominantly on published Irish literature and surveillance systems. Alcohol consumption at a population level was measured using data obtained from the Revenue Commissioners and the Central Statistics Office (CSO). The Revenue Commissioners compile annual alcohol sales figures based on the volume of each alcoholic beverage type released from bonded warehousing on payment of excise duty. The figures for beer and spirits are given in litres of pure alcohol. Figures for wine and cider are given by total volume, and the pure alcohol content is calculated based on an ABV (alcohol by volume) rate of 12.5% in the case of wine and 4.5% in the case of cider.

To study drinking patterns at an individual level, population-based surveys were used, including the Survey of Lifestyles, Attitudes and Nutrition (SLAN), the Health Behaviour in School-Aged Children (HBSC) survey and the European School Survey Project on Alcohol and other Drugs (ESPAD), all of which are carried out every four years. Other surveys examined include the Irish National Drinking Survey and the College Lifestyle and Attitudinal National (CLAN) survey of students in Ireland. Current Irish policy and strategy documents were also reviewed. In addition to the literature review, a number of datasets containing alcohol-related data were analysed by the research group, namely the Hospital In-Patient Enquiry (HIPE) scheme, the General Mortality Register (GMR), the National Drug Treatment Reporting System (NDTRS) and the National Psychiatric In-patient Reporting System (NPIRS). Except in the case of the NPIRS, access to individual-level data rather than aggregated data was sought, as this allowed more extensive data analysis for the purposes of this Overview. This also allowed for the recoding of variables and cross tabulations which enabled us to answer more specific research questions.

3.2 Economic and Social Research Institute

The Economic and Social Research Institute (ESRI) manages the HIPE scheme. This is a computerised health information system designed to collect clinical and administrative data on discharges from and deaths in over 60 acute Irish hospitals. The term discharges is used throughout the document to denote discharges from and deaths in acute Irish hospitals. Discharge and death data are used as a proxy measure for morbidity. Accident and emergency (A&E) and outpatient data are not collected by HIPE. Each HIPE discharge record represents one episode of care; patients may be admitted to hospital(s) more than once with the same or different diagnoses. The records therefore facilitate analyses of hospital activity rather than epidemiological analysis of disease. For each discharge, the primary diagnosis and up to nine (up to five before 2002) secondary diagnoses are recorded, as well as the procedures carried out. For the years under study (1995–2004), diagnoses and procedures performed were coded using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). Different versions of ICD-9-CM were used during this time period and the October 1994 version of ICD-9-CM was used between 1995 and 1998. The October 1998 version of ICD-9-CM was used between 1999 and 2004. Additional codes were introduced in the later version, for example 291.81 (alcohol withdrawal) and 291.89 (unspecified alcohol-induced mental disorders)

which are not available for earlier years. For this analysis the HIPE discharges were recategorised and this is explained in Section 4.3.

As HIPE was designed primarily to provide a minimum dataset on both day and inpatient morbidity and mortality to facilitate analysis of hospital activity, its use for epidemiological purposes has some limitations. The HIPE system records the number of discharges (including deaths) rather than the number of patients and, as these records do not carry a unique personal identifier, it is not possible to determine accurately how many patients with a particular condition are admitted in a given time period. Using HIPE to assess the burden of alcohol use on acute hospital services can lead to an under-estimation of the real impact of alcohol as A&E attendances are not recorded by the HIPE system. It has been highlighted by Hope *et al.* (2005) that 28% of injury visits to Irish A&E departments are alcohol-related, not all of which result in admission. It can therefore be presumed that the level of alcohol morbidity reported in this Overview is an under-estimation.

3.3 Central Statistics Office

In Ireland, the Central Statistics Office (CSO) collates data on alcohol-related deaths extracted from the General Mortality Register (GMR). In each jurisdiction, deaths are notified to the Registrar of Births, Deaths and Marriages who reports these data to the GMR. Depending on the circumstances, deaths are notified by the Coroner Service, by hospitals or by general practitioners. Using data from the GMR, the CSO then categorises the cause of each death in accordance with the WHO ICD manual, ninth revision. For each death, the underlying cause of death and the external cause of death, which describes the circumstances under which the death occurred (E code), are recorded. The main disadvantage of this system is that it records only the underlying cause of death, and not contributory factors. For example, deaths due to accidents where alcohol was the causal factor may not be recorded as alcohol-related deaths. Given these limitations, it can be assumed that the number of alcohol-related deaths recorded by the GMR is an under-estimation of the true number of such deaths.

3.4 Health Research Board

National Drug Treatment Reporting System

The NDTRS is an epidemiological database on treated drug and alcohol misuse in Ireland. It was established in 1990 in the Greater Dublin Area and was extended in 1995 to cover all areas of the country. Originally set up to record drug misuse, the system was extended in 2004 to include problem alcohol use; as yet, coverage for alcohol is incomplete, particularly in Dublin and the West of Ireland. The NDTRS is co-ordinated by staff at the Alcohol and Drug Research Unit of the Health Research Board (HRB) on behalf of the Department of Health and Children. Compliance with the NDTRS requires that a form be completed for each new client coming for first treatment and for each previously treated client returning to treatment for problem alcohol or drug use (or both) in a calendar year. Complete forms are returned to the HRB every quarter. Data collected for each patient

include information on the main problem drug and up to three additional drugs, type(s) of intervention provided during treatment and demographic details. Individuals who are treated for problem alcohol use in psychiatric units or hospitals are recorded by the National Psychiatric In-patient Reporting System (NPIRS) and are not included on the NDTRS database.

National Psychiatric In-patient Reporting System

Established in 1963, the NPIRS database is the only national psychiatric inpatient database in Ireland. It was hosted originally by the Medico-Social Research Board and has been maintained since 1971 by the Mental Health Research Unit of the HRB. Data on admissions and discharges from 52 general hospital psychiatric units, psychiatric hospitals, private hospitals, children's centres and the Central Mental Hospital are returned to the HRB every quarter. Each admission and discharge represents one episode or event, and not an individual patient; while a single individual may have several admissions in any given year, each one of these is recorded as a separate event. Diagnoses are categorised in accordance with WHO ICD–10 categories. This dataset has the same epidemiological limitations as the HIPE scheme.

4 Alcohol-related harm

4.1 Introduction

The contribution of alcohol to both morbidity and mortality is well documented. Alcohol is associated with a range of acute and chronic health consequences, from accidents and assaults to cardiovascular disease, and is implicated in more than 60 different disorders. Most effects of alcohol on disease are detrimental, but, in certain patterns of drinking, a beneficial influence on coronary heart disease, stroke and diabetes mellitus can be observed (Rehm *et al.* 2003). This section provides a brief overview of the acute and chronic consequences of alcohol use. It also describes in greater detail alcohol-related morbidity in Ireland using data from the HIPE scheme and alcohol-related morality using GMR data which have not been published previously.

4.2 Acute and chronic consequences of alcohol use

Alcohol consumption is responsible for a considerable disease burden. It was estimated that, within the EU (25 member states in 2006), alcohol caused approximately 195,000 deaths annually (Anderson and Baumberg 2006). Six per cent of all deaths, 12% of all years of life lost (YLL) and 11% of all disability adjusted life years (DALY) in Europe in 2002 could be attributed to alcohol use, according to WHO figures (Rehm *et al.* 2006). Intentional and unintentional injuries accounted for almost 50% of all alcohol-attributable deaths and almost 44% of the alcohol-attributable disease burden, with young people and men affected the most. The WHO (2002) also identified alcohol as the third highest risk factor for all burden of disease in developed countries, after tobacco and hypertension.

There is a strong correlation between the risk of liver cirrhosis and the volume of alcohol consumed daily, and approximately 20% of alcohol-dependent people develop liver cirrhosis (Seitz and Homan 2001). Liver cirrhosis mortality rates have increased sharply in both Britain and Ireland since the 1950s, but have decreased in the wine-drinking Mediterranean countries (Leon and McCambridge 2006). These increases, which have occurred in conjunction with increased alcohol consumption, are especially evident since 1990 and have been observed in both men and women. Epidemiological data have identified chronic alcohol consumption as a significant risk factor for cancer in the upper aerodigestive tract, including cancer of the oropharynx, larynx and oesophagus, and also in the liver. Furthermore, alcohol increases the risk of developing cancer of the colorectum and the breast, especially in individuals with increased susceptibility to developing cancer (Poschl and Seitz 2004). Pooled analysis has shown that consumption of 10g of pure alcohol per day increases the risk of breast cancer by 9%, and consumption of 30–60g per day is associated with an increased risk of 41% (Smith-Warner *et al.* 1998). The exact mechanisms by which alcohol ingestion results in carcinogenesis remain unknown, as ethanol itself is not a carcinogen.

The relationship between alcohol and coronary heart disease (CHD) can be represented by a J-shaped curve. Low to moderate consumption of alcohol is associated with a lower risk for both CHD incidence and mortality, with the lowest risk being found at 20g per day. However, this beneficial aspect of alcohol is relevant only to middle-aged and older adults, who are at increased risk for heart disease. As the average daily volume of alcohol consumption increases, the risk relationship

reverses, with average daily consumption of 70g or more associated with greater risk than the risk for abstainers (Corrao *et al.* 2000). A systematic review exploring the relationship between alcohol and stroke reported a causal association between heavy drinking and both haemorrhagic and ischemic stroke (Mazzaglia *et al.* 2001). A positive association was also found between binge drinking and stroke, demonstrating an increased risk for stroke related to an increased frequency of binge drinking. Individuals who consume alcohol at harmful levels are also more likely to experience neuropsychiatric disorders, including depression, peripheral neuropathy and cognitive impairment. Other disorders attributable to alcohol include alcoholic polyneuropathy, alcoholic cardiomyopathy, alcoholic gastritis, alcohol-induced chronic pancreatitis and alcoholic hepatitis.

Volume of consumption as well as patterns of drinking, especially irregular heavy drinking, determine the burden of disease caused by alcohol. A study by Rehm *et al.* (2001) showed that all-cause mortality in male drinkers consuming less than two drinks per day was about twice as high if they had occasional heavy drinking episodes. Binge drinking, apart from any long-term effects, can increase impulsivity, reduce inhibition and distort behaviour, which may lead to accidents or suicide. In Ireland, a number of studies have identified the link between alcohol consumption and negative acute consequences. A study in the north-east of Ireland examined coroners' records for all deaths in 2001 and 2002 that were the result of an accident, suicide or injury and found that 55% tested positive for blood alcohol (Bedford *et al.* 2006a). This study found that alcohol was detected in the blood samples of 40% of road traffic fatalities and in 55% of suicides. According to the Irish Water Safety Association (2007), alcohol is a contributory factor in 30% of all drownings, while alcohol is considered a contributory factor in the deaths of 51% of people aged 20 or over who die in fires (National Safety Council of Ireland 2003).

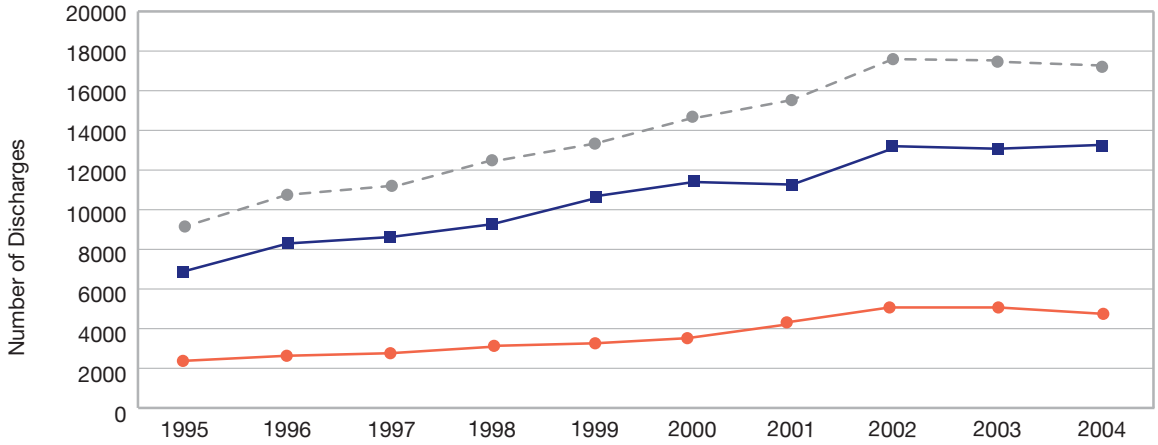
4.3 Alcohol-related morbidity in Ireland

HIPE data from the ESRI were used to assess alcohol-related morbidity. Forty-eight alcohol-related conditions were identified from ICD-9-CM, and all discharges with either a primary or secondary diagnosis of one of these conditions were extracted from the HIPE database (Appendix 1A). The broad diagnostic categories and codes included: alcohol psychoses (291), alcohol dependence (303), non-dependent alcohol abuse (305), alcohol liver disease (571), toxic effect of alcohol (980) and alcohol poisoning associated with the following E-codes (E8600, E8609, E9509, E9809). For the purpose of the analysis presented in this section, alcohol-related conditions were categorised into alcohol-related liver disease and cirrhosis, chronic alcohol conditions, acute alcohol conditions and fetal alcohol syndrome (FAS) (Appendix 1B).

HIPE uses discharges, which can be considered a proxy for admissions, to measure each patient contact. As the HIPE system counts each patient contact and not the number of patients, it is not possible to ascertain the incidence of alcohol-related morbidity. As an alternative, the number of alcohol-related discharges per 100,000 of population aged 15 or over was calculated. The numerators used were obtained from the CSO. It should be noted that in 2002, the potential number

of secondary diagnoses collected by HIPE increased from five to nine. In addition, the coverage of HIPE has increased since 1995, which may partly explain changes in alcohol-related discharges.

Between 1995 and 2004 there were 139,962 alcohol-related hospital discharges. Males accounted for 75% (105,184) and women for 25% (34,778) of discharges. The number of discharges increased by 92% between 1995 and 2002. The number of alcohol-related discharges peaked in 2002, and had decreased slightly (by 2%) by 2004 (Figure 4.1). For the period 1995–2004, the average overall rate of alcohol-related discharges per 100,000 population aged 15 or over was 461.4. This was considerably higher for males (718.4/100,000) than for females (227.8/100,000). In 2004 the number of alcohol-related discharges was 820.7 for males and 260.8 for females.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All Persons	9254	10646	11263	12266	13535	14499	15823	17757	17541	17378
Males	6992	8143	8587	9249	10324	10782	11805	13234	13018	13050
Females	2262	2503	2676	3017	3211	3717	4018	4523	4523	4328

Figure 4.1 Number of alcohol-related discharges in Ireland by year and gender, 1995–2004

Alcohol-related discharges accounted for 874,395 bed days (including day and in-patients) between 1995 and 2004. In 2004, alcohol-related discharges amounted to 117,373 bed days which represented 2.9% of all bed days that year. In 1995, the number of alcohol-related bed days was 55,805, accounting for 1.7% of all bed days.

One-fifth of all discharges (20.1%) were admitted and discharged on the same day and are not presented in Figure 4.2. A further 31% of discharges occurred within two days of admission but 3.4% (4,754) of discharges had been in hospital for more than 28 days. It is not possible to ascertain whether the discharges with longer hospital stays had been admitted to psychiatric units within general hospitals, but 76% of these discharges had either alcohol-related liver disease or other chronic alcohol-related conditions. The type of condition was associated with the length of hospital stay; 88% of those with acute conditions were discharged within a week, compared to just 54% of those with alcohol-related liver disease and 69% of those with other chronic alcohol conditions.

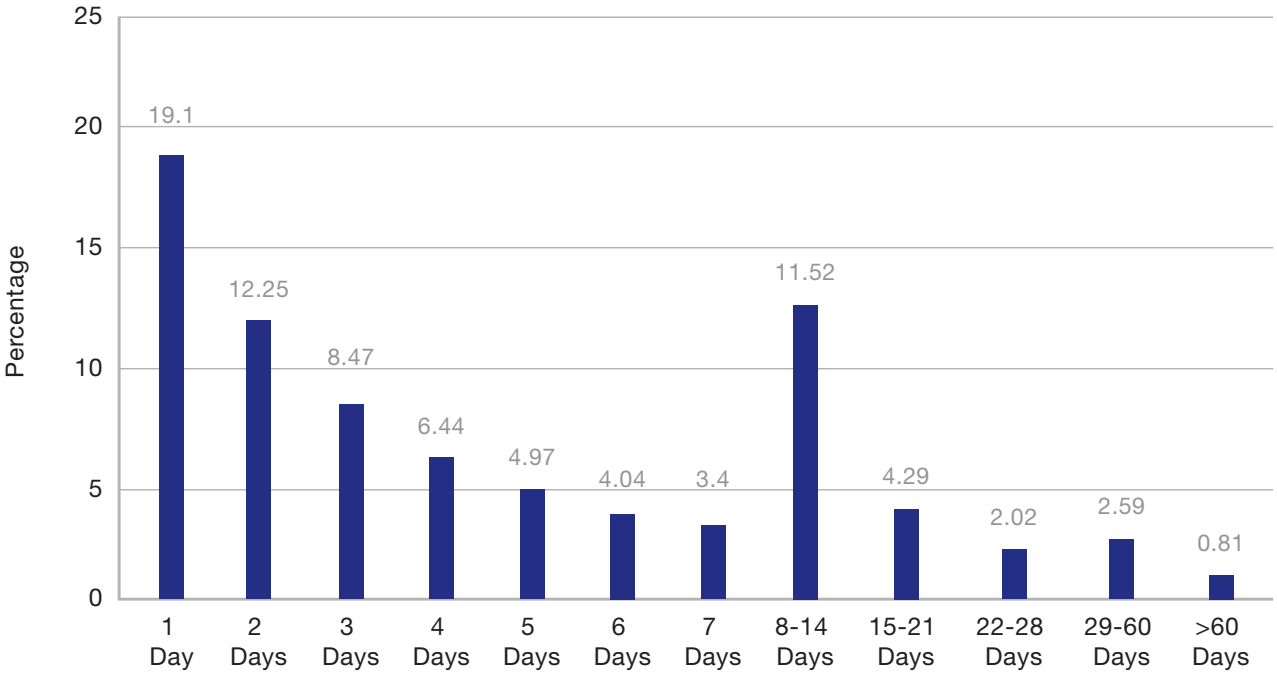
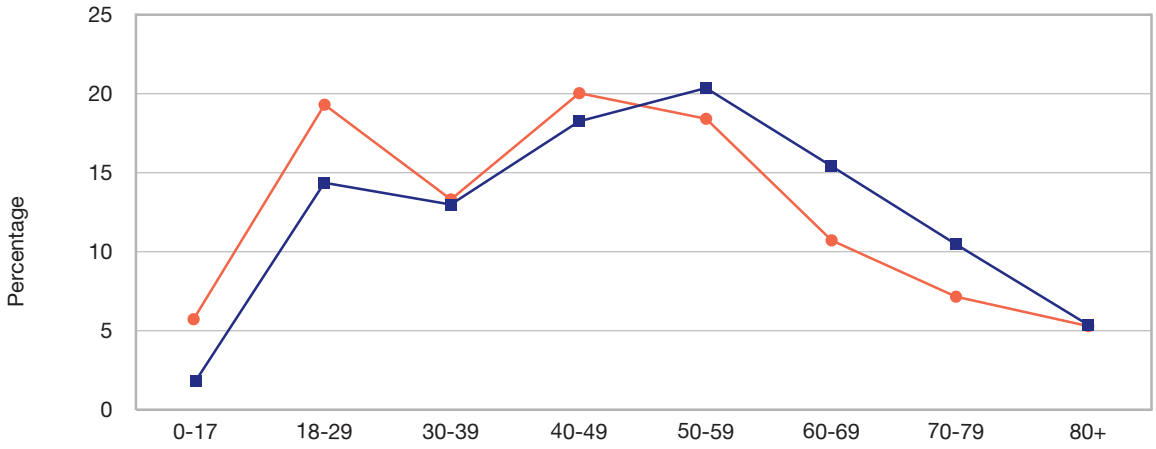


Figure 4.2 Average length of stay for discharges from Irish hospitals with alcohol-related conditions, not presenting those admitted and discharged on the same day, 1995–2004

4.4 Hospital discharges by gender and age

There are a number of differences between the age profiles of male and female discharges. Discharges among males peaked in the 50–59-year age group, compared to the 40–49-year age group among females. For both males and females, the percentage of discharges decreased with increasing age. In general, male discharges tended to be older, with 52% aged 50 years or over, compared to 42% of women (Figure 4.3). One explanation for this may be that health complications arising from alcohol tend to manifest themselves earlier in the drinking careers of women than in men. Alternatively, these trends may be attributable to the fact that middle-aged and older women in Ireland drink less than men and are also more likely to abstain from alcohol altogether (Ramstedt and Hope 2005). Consequently, alcohol-related harm is concentrated among younger women drinkers. One quarter of female discharges were aged under 30 years, compared to 17% of male discharges, reflecting the significant increase in alcohol consumption and binge drinking among young Irish women in recent years. This trend is particularly apparent in women aged under 18 years. Between 1995 and 2004 there was a 29% increase in the proportion of female discharges aged under 18. In comparison, there was just a 9% increase in under-18 male discharges. If alcohol consumption among young women continues to follow current trends, it is likely that the number of middle-aged women experiencing alcohol-related morbidity will increase substantially in the future.

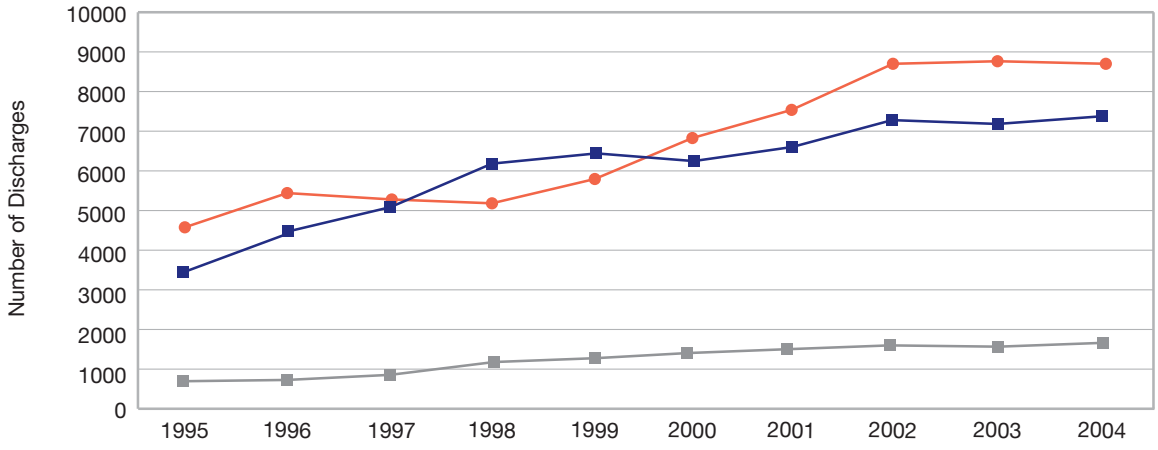


	0-17	18-29	30-39	40-49	50-59	60-69	70-79	80+
Males	2.3	14.9	13.0	18.0	20.3	15.7	10.4	5.3
Females	5.5	19.1	13.4	20.0	18.3	10.9	7.6	5.2

Figure 4.3 Percentage of alcohol-related hospital discharges by gender and age, 1995–2004

4.5 Hospital discharges by type of alcohol-related condition

There has been a dramatic increase in the numbers discharged from hospital in each of the diagnostic groups described in section 4.3 (Figure 4.4). Given the concomitant increase in alcohol consumption per capita, it would have been expected that the largest rate of increase would be seen in acute conditions. However, between 1995 and 2004 acute conditions increased by 75%, while chronic conditions and liver conditions increased by 92% and 147% respectively. It is possible that a sizeable proportion of those with acute conditions were treated in A&E units without actually being admitted to hospital, and were therefore not recorded by the HIPE scheme. The A&E study by Hope *et al.* (2005) found that 28% of injuries were alcohol-related, 48% of which occurred to people aged under 30 years. The increase in liver conditions, most notable since 2000, is surprising as alcohol-related liver conditions usually arise after a number of years of excessive drinking.

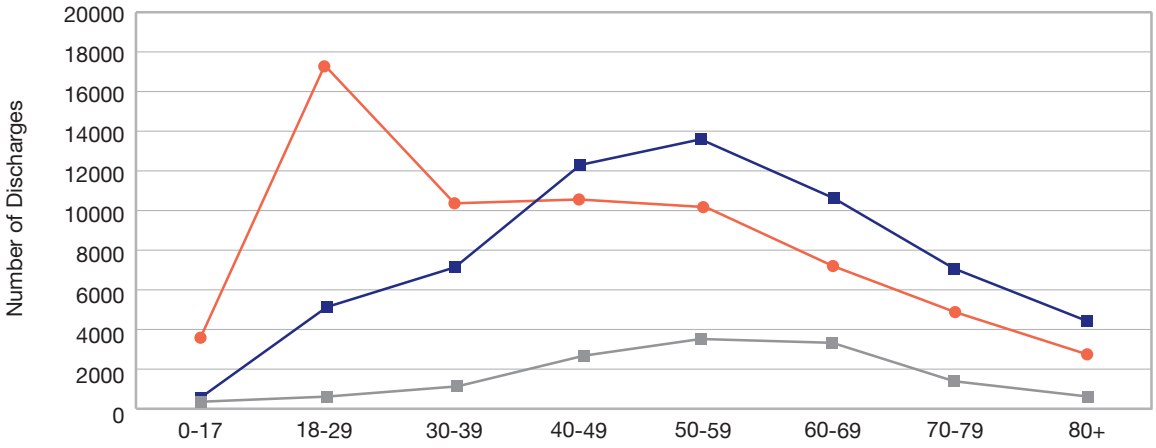


	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Acute Conditions	4711	5431	5276	5111	5932	6951	7585	8836	8841	8257
Chronic Conditions	3829	4446	5051	6060	6424	6230	6641	7237	7071	7370
Liver Disease	705	756	914	1078	1158	1308	1584	1676	1616	1745

Figure 4.4 Number of alcohol-related discharges by year and diagnosis, 1995–2004

4.6 Hospital discharges by type of alcohol-related condition and age

Acute conditions were more prevalent among younger people, while chronic conditions and liver disease were more common among older age groups (Figure 4.5). Although acute conditions accounted for the majority of discharges aged under 30 (81%) it is somewhat worrying that almost 5,000 discharges were of people under 30 with chronic conditions, given that these conditions usually develop after a number of years of hazardous drinking and consequently are normally seen in much older people. In 2004 alone, there were 45 discharges of under-17-year-olds with chronic conditions which places them at a great risk of premature mortality due to alcohol. The numbers admitted with chronic conditions or liver disease increased steadily with age and peaked in the 50–59-year age group. The number of discharges for both types of condition decreased in successively older age groups. This decrease may be explained by an increased incidence of alcohol-related mortality in those aged 50 or over. Using GMR data, for the corresponding time period, 63% of people who died of alcohol-related conditions were aged 50 years or over.



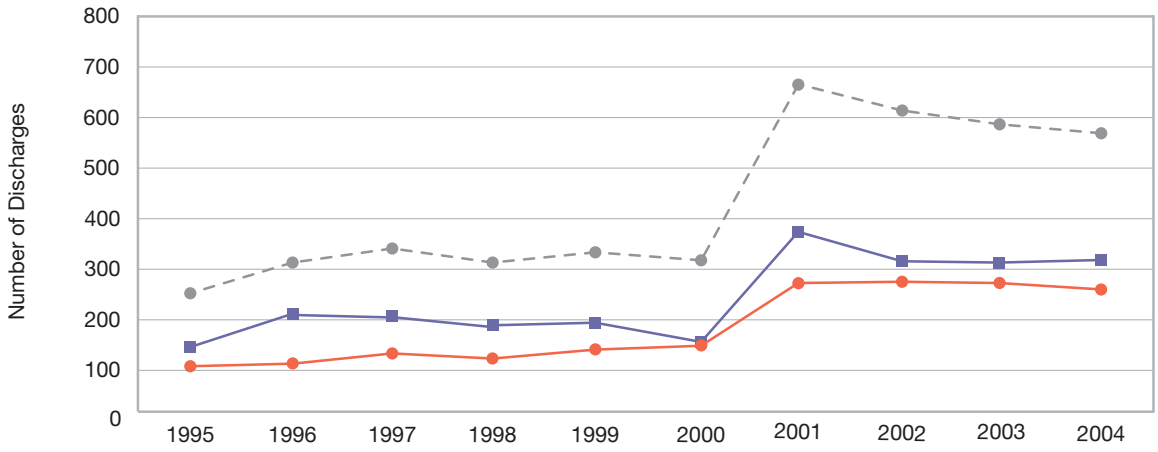
	0-17	18-29	30-39	40-49	50-59	60-69	70-79	80+
Acute Conditions	3796	17594	10044	10523	10015	7115	4954	2812
Chronic Conditions	418	4580	7258	12508	13913	10516	7099	4008
Liver Disease	6	156	1066	2863	3774	2650	1515	511

Figure 4.5 Number of alcohol-related discharges by age and diagnosis, 1995–2004

4.7 Hospital discharges among young people

The increase in alcohol consumption and binge drinking among young people in recent years has been well documented, and young people in Ireland have been shown to be among the heaviest drinkers in Europe. The increased consumption has coincided with a doubling of the number of young people admitted to hospital with alcohol-related conditions between 1995 and 2004 (Figure 4.6). There was a considerable increase in the number of discharges between 2000 and 2001 for both males and females. Explanations for this increase may include the extending of opening hours under the Intoxicating Liquor Act 2000 and the introduction of the Children Act 2001.

In all of the older age groups, there were many more male than female discharges, but among those aged under 18 there was little difference between the number of male and female discharges, particularly from 2000 onwards. In recent years it has become more socially acceptable for women to consume alcohol in greater volume and in patterns mirroring those of their male counterparts. Successive ESPAD reports have indicated that alcohol consumption among young schoolgirls in Ireland has increased substantially since 1995, with the increase in alcohol-related morbidity a clear reflection of these trends.

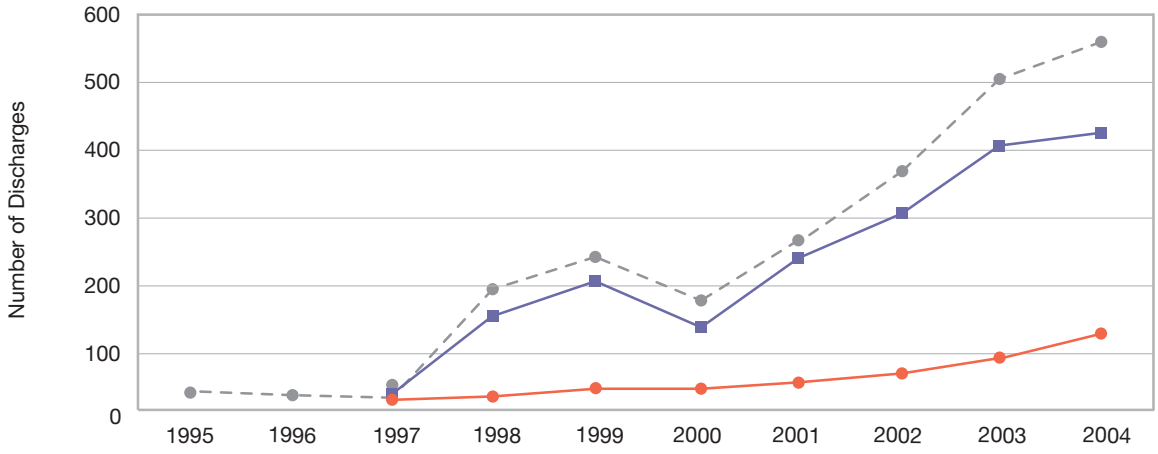


	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All Persons	260	319	340	317	335	320	674	608	594	579
Males	152	206	201	194	195	176	385	315	305	309
Females	108	113	139	123	140	144	289	293	289	270

Figure 4.6 Alcohol-related hospital discharges of under-18s by year and gender, 1995–2004

4.8 Detoxification and alcohol-related discharges

There has been a significant increase in the number receiving in-patient detoxification since 1995 (Figure 4.7). In 1995, there were just 28 detoxifications, but by 2004 this figure had increased to 567. The rate of increase is more pronounced in females, with 133 detoxifications carried out in females in 2004, compared to 13 in 1997. While the increase in alcohol consumption partly explains the increase in the numbers undergoing detoxification, it would appear that changes in clinical practice are also responsible for this increase.



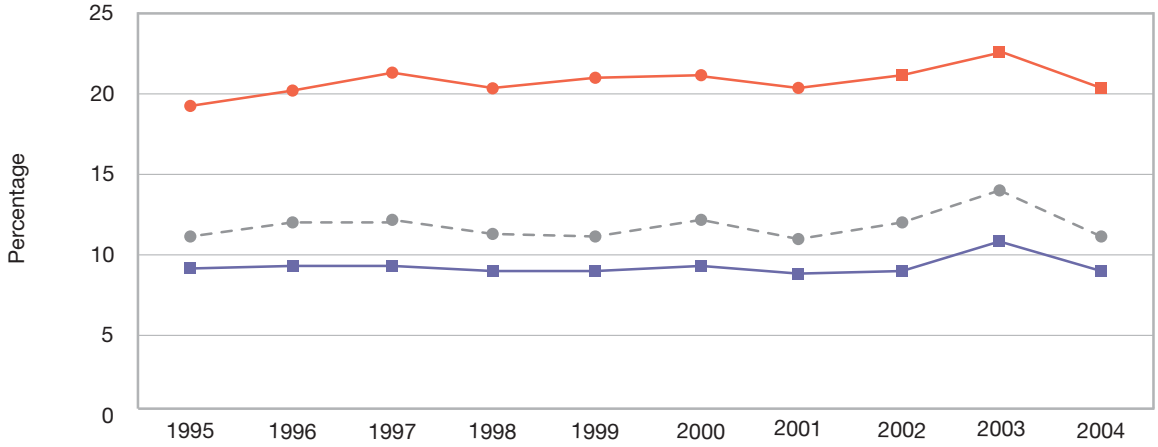
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All Persons	28	21	55	197	243	185	288	381	503	567
Males*			42	176	204	146	235	309	409	434
Females*			13	21	39	39	53	72	94	133

Figure 4.7 Number receiving alcohol detoxification by year and gender, 1995–2004

* Males and females for 1995 and 1996 excluded as some cells contained five or less discharges

4.9 Alcohol-related discharges with additional drug-related diagnoses

Twelve per cent of all alcohol-related discharges had an additional drug-related diagnosis. The percentage of discharges from HIPE with a drug-related diagnosis was consistent for both males and females throughout the 10-year period under review. The percentage of female hospital discharges with drug-related conditions was twice that of males (Figure 4.8). According to the NDTRS (another data source) a higher percentage of males with problem alcohol use reported polydrug use. For a large number of females, these discharges were related to suicide attempts using analgesics or psychotropic agents in conjunction with alcohol. According to the National Registry of Deliberate Self Harm (2005), drug overdose is a more common method of self-harm among women than among men, which may explain the high percentage of female discharges. The age profiles of male and female polydrug discharges were very similar. Thirty-six per cent of both male and female discharges were aged under 30 years.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All Persons	11.5	12.1	12.4	11.8	11.7	12.5	11.5	12.1	14.3	11.9
Males	9.0	9.5	9.4	8.9	8.8	9.5	8.5	9.0	11.1	8.9
Females	19.3	20.6	21.9	20.9	21.0	21.2	20.4	21.3	23.4	20.8

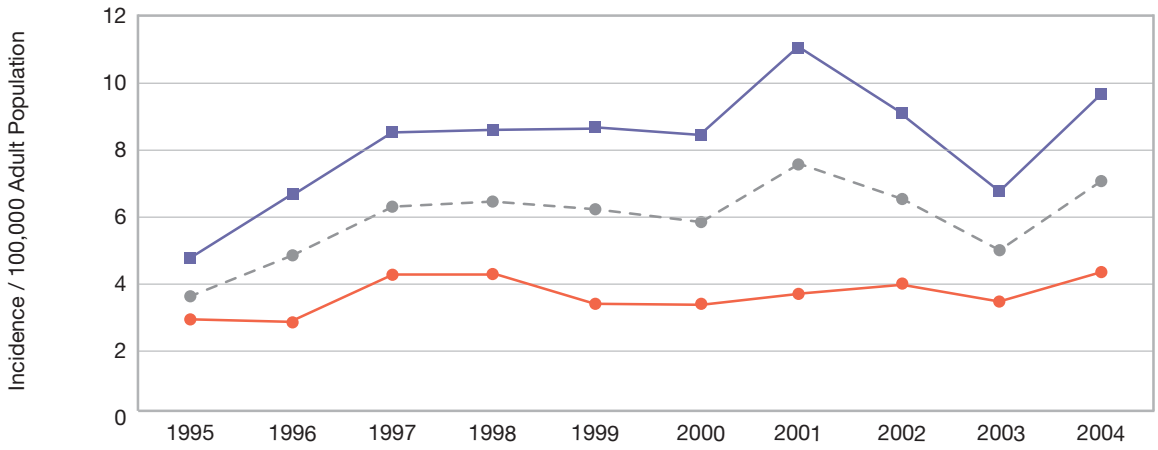
Figure 4.8 Percentage of alcohol-related discharges with additional drug-related diagnoses by year and gender, 1995–2004

4.10 Alcohol-related mortality in Ireland

In Ireland, each death is recorded by the General Mortality Register (GMR), which is managed by the Central Statistics Office (CSO). One of the problems encountered in attempting to ascertain the number of alcohol-related deaths is that the involvement of alcohol in a death may be missed by those certifying the death or may be deliberately excluded to protect the reputation of the deceased. In other cases, the involvement of alcohol may be a matter of probability rather than of certainty. For example, some of those who die in road traffic accidents and are found to have a high blood alcohol concentration might have died anyway because of external factors, even if there had been no alcohol involved. Since the GMR only records the main cause and the external cause of death, it can be assumed that the figures presented here are an under-estimation of the role of alcohol in mortality in Ireland.

A total of 29 alcohol-related ICD codes were identified and used to extract data on alcohol-related deaths from the GMR (Appendix 2A). For the purpose of this analysis, alcohol-related conditions were categorised into alcohol-related liver disease and cirrhosis, chronic alcohol conditions, acute alcohol conditions, and other causes (Appendix 2B).

Between 1995 and 2004, 1,775 alcohol-related deaths were recorded by the GMR. All but two of these were aged over 15; for the purpose of calculating incidence rates, those aged under 15 were excluded. The incidence of alcohol-related mortality increased from 3.8 to 7.1 per 100,000 adults, with a greater increase among men than among women (Figure 4.9). The trends in mortality in men from 2000 onwards are surprising, with an increase of 29% between 2000 and 2001, which was followed by a decrease of 30% over the next two years. In 2004, another large increase, of 34%, in mortality rates occurred. There are no obvious reasons for these trends.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All Persons	3.8	4.8	6.3	6.4	6.2	5.9	7.6	6.5	5.3	7.1
Males	4.6	6.7	8.5	8.7	8.9	8.3	11.3	9.1	7.2	9.9
Females	3.0	2.9	4.2	4.2	3.5	3.5	3.9	4.0	3.6	4.3

Figure 4.9 Average incidence of alcohol-related mortality among the adult population by year and gender, 1995–2004

4.11 Alcohol-related mortality in each Irish county

Figure 4.10 shows the average alcohol-related mortality among adults in Ireland from 1995 to 2004. There was very little variation in incidence between counties, with 17 counties having an incidence rate of between 4 and 5 per 100,000 adult population. The average incidence for the whole country was 6.0, while Sligo had the highest incidence at 8.6, followed by Dublin with 8.1. Offaly had the lowest recorded incidence at 2.8, considerably lower than the national average.

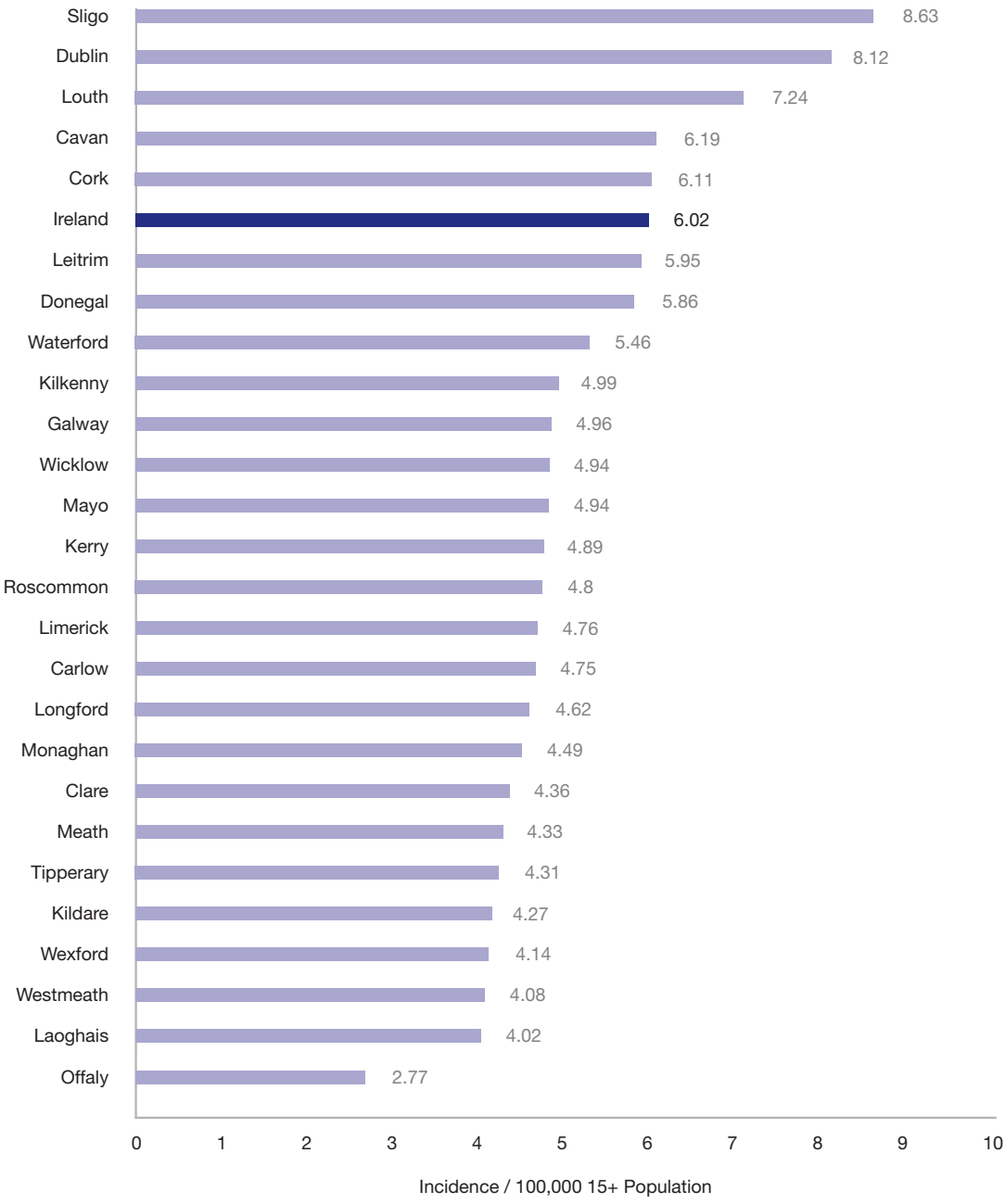
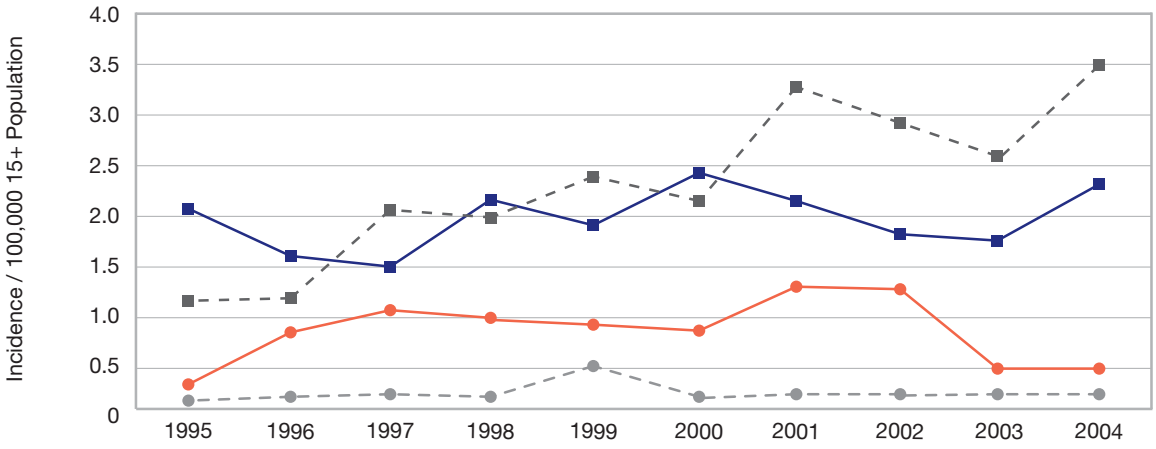


Figure 4.10 Average annual incidence of alcohol-related deaths per 100,000 of the population aged 15 or over by county, 1995–2004

4.12 Alcohol-related mortality by type of condition

When the mortality incidence by type of condition is analysed, no obvious trends emerge, except in relation to liver disease, which has shown a general increase from 1995 and, since 2001, has been the leading cause of alcohol-related mortality (Figure 4.11). The mortality incidence from chronic and acute conditions increased slightly between 1995 and 2004, although there were some fluctuations in the interim. The 'other causes' category relates to cases where there was not enough information to determine the exact cause of death. For example, there were a number of people who died from

exposure to weather conditions with underlying alcohol dependence syndrome and who did not fit into any of the other categories. The unusual trends may also be explained by practices in the CSO. In the case of mortality data, the clerical officers at the CSO code just the underlying cause of death and the external circumstances (if applicable).

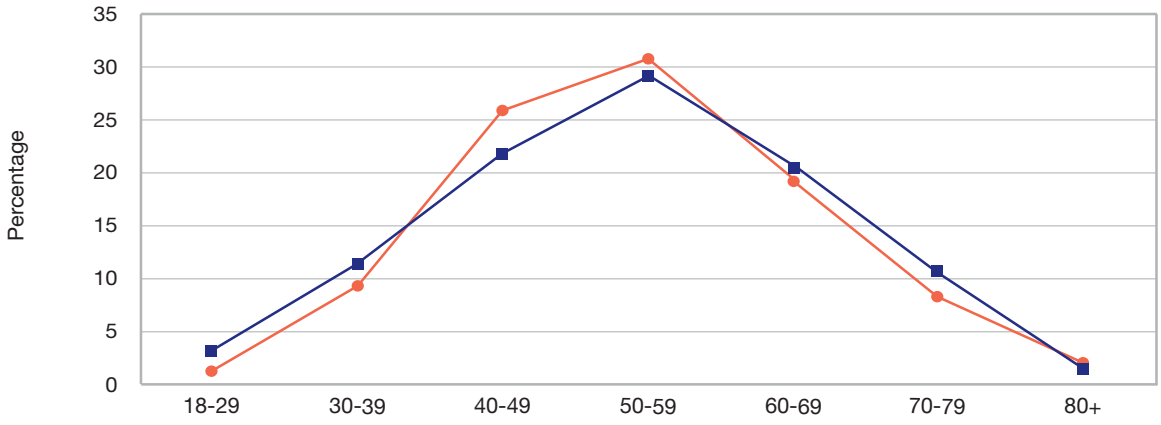


	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Acute Conditions	0.3	0.9	1.1	1.0	0.9	0.7	1.3	1.2	0.5	0.5
Chronic Conditions	2.1	1.6	1.5	2.2	1.9	2.4	2.2	1.8	1.7	2.3
Liver Disease	1.2	1.3	2.1	2.0	2.4	2.2	3.3	2.9	2.6	3.5
Other Causes	0.1	0.2	0.3	0.2	0.5	0.2	0.3	0.3	0.3	0.3

Figure 4.11 Incidence of alcohol-related mortality among the adult population by year and type of condition, 1995–2004

4.13 Alcohol-related mortality by gender and age

Alcohol-related mortality peaked for both men and women in the 50–59-year age group, and 68% of deaths occurred in people aged under 60 (Figure 4.12). In comparison, just 21% of deaths in the general Irish population for the same time period were aged under 65, highlighting the increased risk of premature mortality associated with problem alcohol use.



	18-29	30-39	40-49	50-59	60-69	70-79	80+
Males	3.7	11.5	22.5	29.3	20.2	10.6	2.1
Females	1.8	9.7	26.8	31.1	19.7	8.4	2.5

Figure 4.12 Percentage of alcohol-related deaths by gender and age, 1995–2004

4.14 Comparison of alcohol-related morbidity and mortality

Although both GMR and HIPE data showed increases in deaths and discharges respectively, the trends for both were quite different. The number of discharges increased steadily each year from 1995, peaking in 2002, and showed a slight decrease over the next two years (Figure 4.13). In comparison, the number of deaths increased sharply between 1995 and 1997 and remained stable until 2000. From 2001, there were fluctuations in the number of deaths which are difficult to interpret.

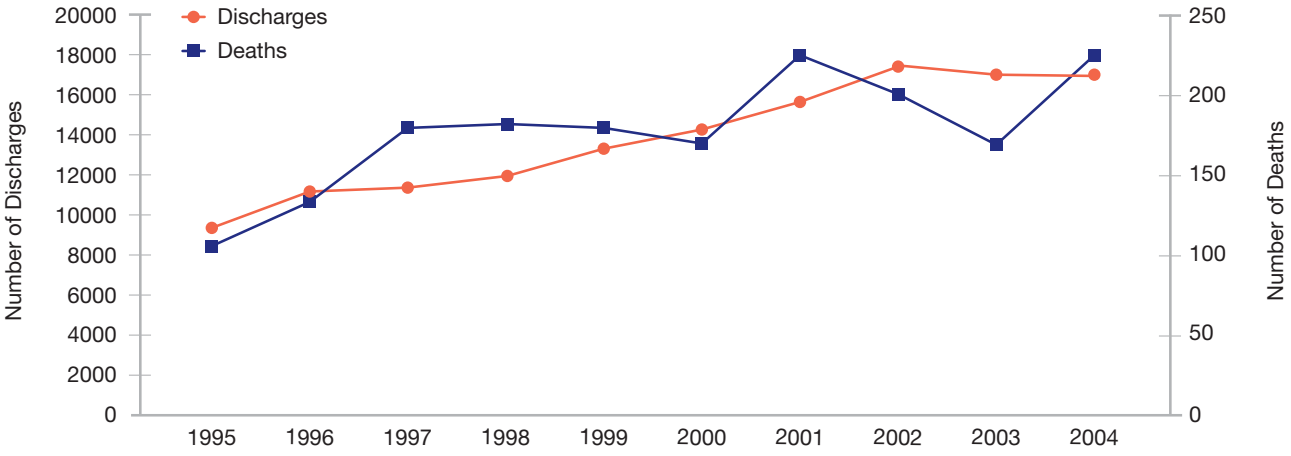
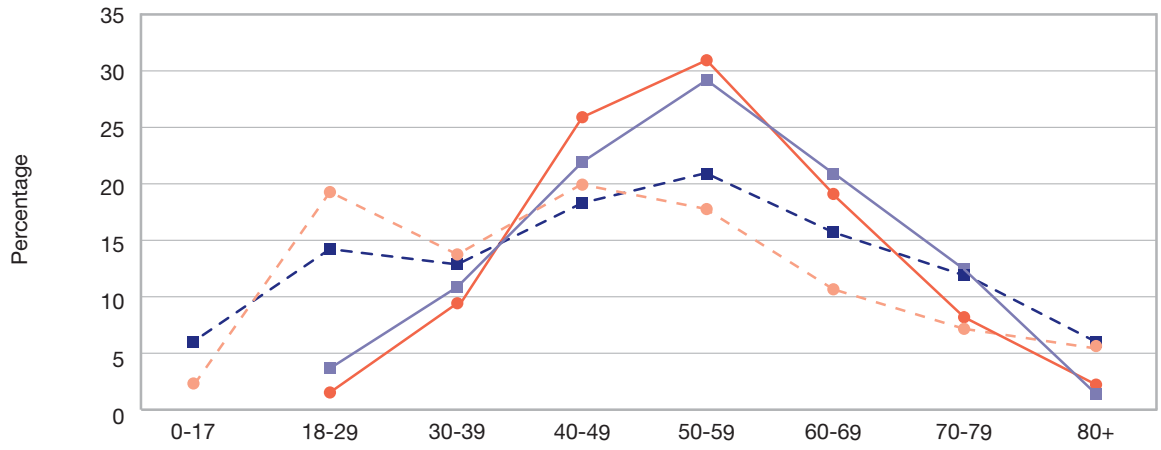


Figure 4.13 Comparison of alcohol-related mortality and morbidity trends, 1995–2004

There was greater variation in the age profile of alcohol-related discharges than in that of alcohol-related deaths (Figure 4.14). Half of all deaths occurred in people aged between 50 and 70 years, compared to 34% of discharges. This is not surprising, given that there can be a considerable time lag between the onset of an alcohol-related chronic condition and death. There was a lower proportion of deaths among young people – just under 4% of deaths occurred in people aged under 30, compared to 19% of discharges. The percentage of both deaths and discharges decreased in successive age groups over the age of 60.



	0-17	18-29	30-39	40-49	50-59	60-69	70-79	80+
Male Deaths		3.7	11.5	22.5	29.3	20.2	10.6	2.1
Female Deaths		1.8	9.7	26.8	31.1	19.7	8.4	2.5
Male Discharges	2.3	14.9	13.0	18.0	20.3	15.7	10.4	5.3
Female Discharges	5.5	19.1	13.4	20.0	18.3	10.9	7.6	5.2

Figure 4.14 Comparison of alcohol-related mortality and morbidity by age, 1995–2004

For both chronic alcohol conditions and alcohol-related liver conditions, the trends in the numbers of discharges and deaths were quite similar, albeit with some fluctuations in chronic conditions. However, for acute conditions, the differences between deaths and discharges were more pronounced (Figure 4.15). While the number of discharges showed a steady increase between 1995 and 2004, the number of deaths varied widely. A possible explanation for this may be the fact that the GMR only codes one direct cause of death and, in cases where alcohol was a causal factor (e.g. accidents, suicide), the contribution of alcohol may have been missed and consequently not recorded.

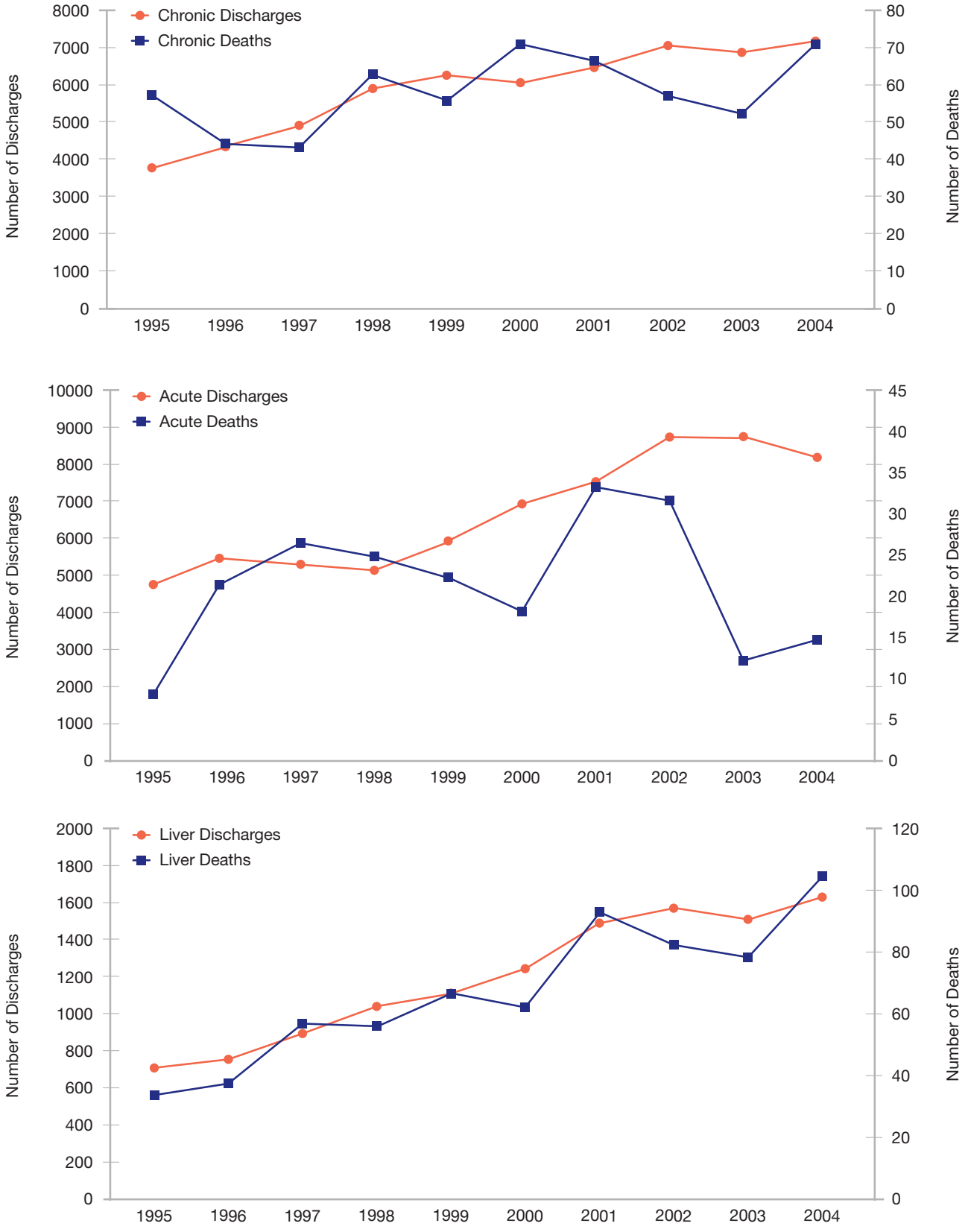


Figure 4.15 Comparison of alcohol-related mortality and morbidity by type of condition, 1995–2004

4.15 Alcohol and driving

Driving under the influence of alcohol has been a statutory offence in Ireland since the introduction of the 1961 Road Traffic Act. It has been proven that all levels of blood alcohol concentration (BAC) are associated with a higher risk of crashes, relative to a BAC of zero, and that the risk of injury increases exponentially with markedly higher BACs. Studies have found that for a driver with a BAC of 0.05% the risk of crashing a vehicle is double that for a person with a zero BAC. The threshold for deterioration on psychomotor tasks, including reaction time, cognitive processing, co-ordination and vigilance, is generally around 0.04 to 0.05 BAC (Eckardt *et al.* 1998). At a BAC of 0.08, the risk is multiplied by 10 and at BACs of 0.15 or higher, the crash risk is in the hundreds (Borkenstein *et al.* 1974). The majority of European countries have adopted a BAC limit of 0.05 for drivers; however, Ireland and the UK have lagged behind the rest of Europe, with an accepted BAC of 0.08. Sweden has a BAC limit of 0.02, which has had a substantial effect on drink-driving fatalities since its introduction in 1990.

A study analysing all fatal road crashes in Ireland in 2003 found alcohol to be a contributory factor in 110 (36%) of 335 fatalities (Bedford *et al.* 2006b). Alcohol was considered to be a factor if the person tested positive for a BAC equal to or greater than 0.02, or equivalent levels in urine or breath samples. Alcohol-related fatal road crashes were three times more likely to have occurred on Saturday, Sunday or Monday than on other days of the week. Half of the accidents that occurred on Mondays (n=22) happened before 8.00 am and 54% of these were alcohol related. Of all drivers killed (188), 76 (40%) had a BAC greater than 0.02. The study also found that male drivers, particularly those in the 19–34-year age group, were those most likely to be killed while under the influence of alcohol. Pedestrian deaths accounted for 63 (19%) of all deaths and alcohol was a factor in 24 (38%) of these.

Legislation allowing random breath testing was introduced in Ireland in July 2006 and has already been shown to be effective in reducing road deaths. In the first year after its introduction there were 330 road deaths, a decrease of 20% compared with the 412 deaths in the corresponding period in 2005/6. Drink-driving arrests for 2006 totalled 17,788, which represented a 33% increase on 2005. A review of 23 studies of random breath testing to assess its effectiveness found a decline of 13%–36% in fatal road crashes following its implementation (Shults *et al.* 2001). A Eurobarometer report published in March 2007 revealed that there was widespread support among the Irish public for initiatives to reduce alcohol-related road fatalities. The majority of Irish respondents (74%) were in favour of lowering the BAC limit for young and novice drivers to 0.02, and 91% agreed that random breath tests were effective in restraining people from consuming alcohol before driving (TNS Opinion & Social 2007). A number of countries have introduced a graduated licensing system, whereby the BAC limit for young or inexperienced drivers is set at zero. This measure has been shown to be effective in reducing drink driving among younger people.

4.16 Alcohol and suicide

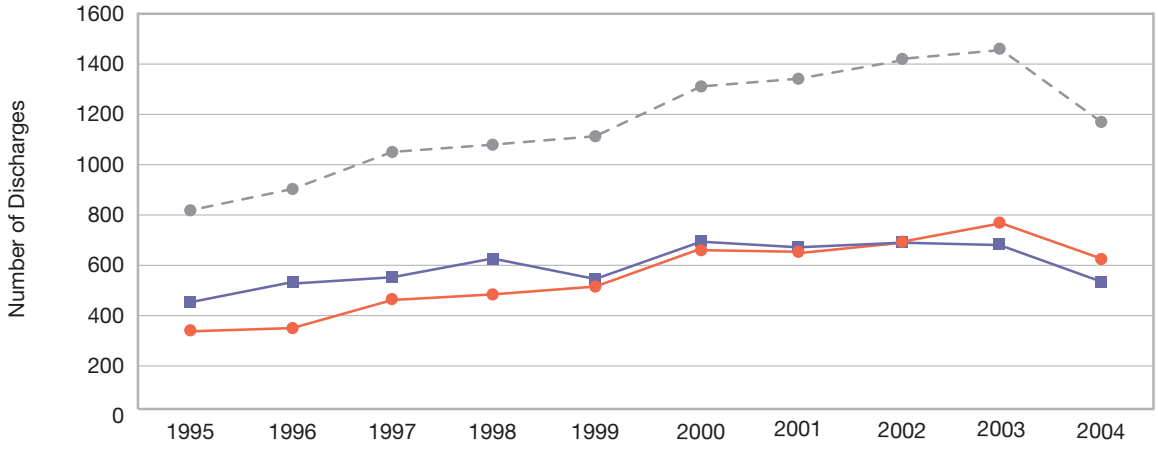
There is a strong link between both chronic and acute problem alcohol use and suicide and a positive association has been found between rising per capita consumption and suicide rates (Ramstedt 2001). An analysis of mortality studies calculated a lifetime risk of suicide of 7% among people dependent on alcohol (Inskip *et al.* 1998). It is estimated that alcohol abuse or dependence may account for between 15% and 24% of completed suicides (Gorwood 2001).

Bedford *et al.* (2006a) found that 56% of suicides tested positive for alcohol. This association was much more marked in people under 30, of whom 92% tested positive for alcohol. A report on suicide in Ireland found that 16.4% of the deceased were known to have a history of alcohol abuse, but less than half of these had attended counselling (Department of Public Health 2001). Among the report's recommendations were the development and implementation of a new alcohol policy as a matter of priority, the training of health care professionals to recognise alcohol-related problems, and the development of support services for those with alcohol-related problems to ensure flexibility, accessibility, and a low threshold for referral. These recommendations would appear to be very pertinent given that suicide has been identified as the leading cause of death in Irish men in the 15–34-year age group. Alcohol is also associated with parasuicide and, according to the National Suicide Research Foundation (NSRF) (2005), there was evidence of alcohol consumption in 41% of all episodes of deliberate self-harm registered in 2005. This was more often the case for men (46%) than for women (38%).

There a number of ways in which alcohol consumption may lead to suicide. It is possible that some individuals consume alcohol in an attempt to turn suicidal ideation into action. The individual may believe that alcohol will disinhibit them and provide the motivation to carry out a suicide attempt. It is also possible that the effects of acute alcohol intoxication, such as impaired decision making and deficits in emotional and cognitive reasoning, may exacerbate lowered mood and lead to difficulties in problem solving. This may prompt a person to see suicide as a solution to a problem and to act on suicidal ideation.

HIPE data were used to study alcohol-related intentional injuries between 1995 and 2004. Just 2.8% of discharges were deemed to have poisoned themselves intentionally by alcohol. However, when suicide attempts by other means were included, the percentage of alcohol-related intentional injuries among those discharged was calculated as 8.4% (11,745). As expected, the majority of these cases (70%) were in the 15–34-year age group. While there were similar numbers of males and females, 5.8% of males with alcohol-related discharges had intentional injuries compared with 16.2% of female discharges. There was an increase of 85% in the number of discharges with alcohol-related intentional injuries between 1995 and 2003, but there was a decrease of 19% in 2004, which is difficult to explain (Figure 4.16).

Just over a quarter (26%) of discharges with intentional injuries had an underlying chronic alcohol condition, while the remainder had acute alcohol conditions.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All Persons	805	906	1049	1097	1117	1324	1355	1406	1488	1198
Males	442	527	589	604	586	692	681	703	696	582
Females	363	379	460	493	531	632	674	703	792	616

Figure 4.16 Number of discharges with alcohol-related intentional injuries by year and gender, 1995–2004

5 Alcohol treatment in Ireland

5.1 Introduction

Until relatively recently, the concept of alcoholism as a disease which could be medically treated was championed. This approach focused on patients who experienced loss of control over their drinking and who were alcohol dependent, while largely ignoring those with less severe problems who were drinking enough to harm their health or social well-being but who did not conform to the typical stereotype of an 'alcoholic'. Since the 1970s, a public health perspective has emerged which acknowledges that alcoholism is not a disease but that there exists a spectrum of alcohol problems. This viewpoint recognises the need to broaden the scope of treatment services from an exclusive focus on 'alcoholism' to include the large group of drinkers whose problems are less severe. Consequently, the concepts of early identification and brief intervention have attracted widespread attention from policy makers. This section describes the methods used to detect problem alcohol use and the treatment options available for these problems. Using data from the NDTRS and NPIRS, the incidence of treatment seeking, the socio-demographic features of those accessing treatment services and the type of treatment provided to service users in Ireland will be described.

5.2 Detection of problem alcohol use

Early detection is essential to identify problem drinkers who have not sought help, and targeted rather than universal screening is recommended. A number of screening instruments have been developed, including screening questionnaires, biological markers of recent alcohol consumption and clinical indicators using clinical history or signs at physical examination. Two of the more common validated screening questionnaires are the AUDIT (alcohol use disorders identification test) and CAGE (an acronym derived from the themes of each question – cut down, annoyed, guilty, and eye opener) tests. The AUDIT is a 10-question survey that includes questions about the quantity and frequency of current drinking and drinking history. It is considered effective in identifying problem alcohol use as it has good sensitivity and specificity for detecting hazardous and harmful drinking and has been validated for use in a wide range of settings and populations (Coulton *et al.* 2006). The CAGE questionnaire is a valid predictor of lifetime alcohol use and is considered a more appropriate measure of alcohol dependency. It is also suitable for use in busy settings. Its main limitation is its inability to differentiate between current and former alcohol use.

Three categories of alcohol misuse have been identified:

- Hazardous drinking, which is defined as 'a pattern of alcohol use that increases the risk of harmful consequences for the user' (WHO 1994), and applies to a person drinking over recommended limits but without apparent alcohol-related problems.
- Harmful drinking which is defined as 'a pattern of use which is already causing damage to health'. This damage may be physical or mental (WHO 1993).
- Dependent drinking, which refers to drinking associated with an established moderate or severe level of dependence on alcohol.

5.3 Types of treatment for problem alcohol use

For people with harmful or hazardous drinking patterns, brief intervention carried out in a primary care setting, aimed at the reduction of drinking to moderate levels of consumption, may be sufficient (Figure 5.1). Although primary care has been identified as an ideal setting for screening those with harmful drinking patterns who do not have any apparent problems or dependence, screening does not routinely take place in Irish primary care sites. The Alcohol Aware Practice Service Initiative, a partnership between the Irish College of General Practitioners and the HSE, conducted a pilot study to determine whether screening and brief interventions were effective in primary care (Anderson *et al.* 2006). Of the 4,584 patients who were screened using the AUDIT questionnaire, 22% were drinking alcohol to hazardous levels and 17% were considered harmful or dependent drinkers. Following brief intervention and/or referral to an on-site counsellor, patients were assessed to determine whether the intervention had made any difference. At least one third of the patients who were screened and followed up made significant progress and another third made positive progress. These results are consistent with international studies that highlight the effectiveness of screening and brief interventions delivered in primary care settings (Ballesteros *et al.* 2004; Whitlock *et al.* 2004). A randomised control trial conducted in the UK (Crawford *et al.* 2004) investigated the effect of screening and referral of patients attending an emergency department who were found to be misusing alcohol. This study concluded that opportunistic identification and referral for alcohol misuse in an emergency department was feasible and was associated with lower levels of alcohol consumption over the following six months, as well as reduced re-attendance at the department.

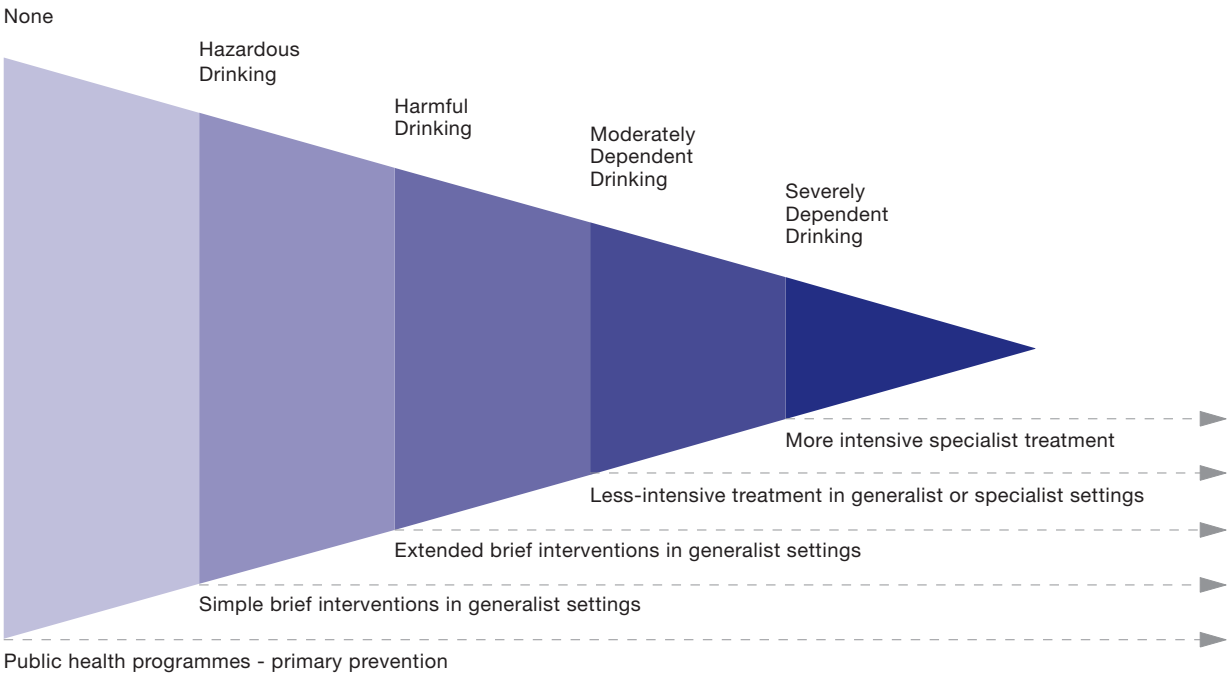


Figure 5.1 A spectrum of responses to alcohol problems

Source: Rastrick *et al.* (2006), adapted from Institute of Medicine (1990)

For service users with moderate or severe alcohol dependence, alcohol-focused treatments in specialist alcohol or addiction services are most appropriate. The cognitive behavioural family of interventions is well researched and has been shown to be effective for this group of service users. These treatments concentrate on the service user's drinking and alcohol-related problems and are best deployed in community settings where the service user has the opportunity to try out newly learned behaviour in the real environment and get immediate feedback on performance. Examples include the community reinforcement approach, social behaviour and network therapy, behavioural self-control training and coping and social skills training.

Pharmacotherapies are generally targeted at a narrow spectrum of symptoms or psychological problems and are usually insufficient to constitute a treatment package when given alone. When combined with psychosocial therapies, pharmacotherapies consistently improve addiction outcomes. Detoxification is a common procedure which may be undertaken in any treatment setting; chorodiazepoxide is the drug of choice for uncomplicated detoxification. Relapse-prevention medications include sensitising agents which produce an unpleasant reaction when taken with alcohol and anti-craving medications which act upon endogenous neurochemical systems to reduce alcohol cravings. An example of a sensitising agent is disulfiram, while naltrexone and acamprosate are examples of anti-craving medications.

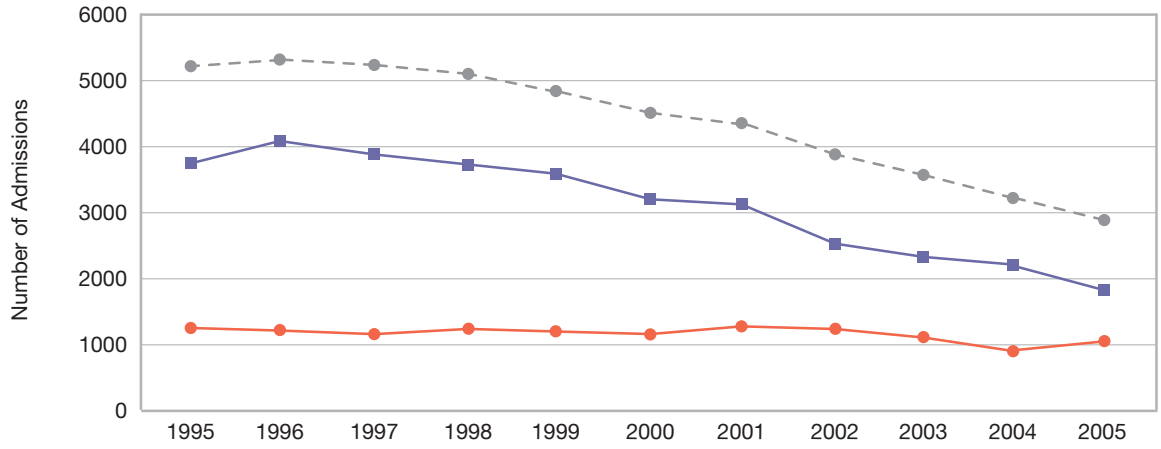
There is no best treatment or intervention for alcohol problems. Rather, there is a range of effective treatments for different types of service users in different settings. People whose problems are more complex, by virtue of severe dependence, psychological morbidity or social disorganisation, are likely to need more intensive treatments. The selection of appropriate treatment depends on clinician preference, client choice and availability of trained and enthusiastic therapists. Effective treatment requires a delivery system that has the following three components – organisational support to clinical services, well-trained therapists and a repertoire of specific interventions that meet service users' needs.

5.4 Treatment for problem alcohol use in Ireland

In Ireland, treatment for alcohol problems takes place in a variety of statutory and non-statutory settings, including general hospitals, psychiatric hospitals, community-based services and residential centres. Since the publication of *Planning for the future* in 1984, outpatient units have become the dominant setting for treating people with problem alcohol use, except for those who require complicated detoxification in residential settings or those whose problems are more complex and who need more intensive treatments.

In spite of the shift in emphasis towards outpatient treatment, a sizeable proportion of those with alcohol problems still receive treatment in psychiatric units. However, since 1995 there has been a notable decrease in the number of admissions with alcohol as the primary diagnosis. According to the NPIRS, there were 5,262 alcohol-related discharges in 1995, compared to 2,995 in 2005,

representing a decrease of 43% (Figure 5.2). In spite of this reduction, alcohol-related disorders were ranked as the third most common reason for admission to Irish psychiatric hospitals in 2005, with 14% (2,995) of admissions having alcohol-related disorders as their primary diagnosis (Daly *et al.* 2006). These included 962 first admissions, which accounted for 32% of all alcohol-related admissions. Sixty-five per cent were male and 18% (544) had a secondary diagnosis. Depressive disorders were the most common secondary diagnosis (44%). There were a further 505 admissions with a secondary diagnosis of alcoholic disorder.



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
All Persons	5262	5435	5250	5055	4859	4517	4366	3956	3603	3217	2995
Males	3897	4071	3900	3745	3621	3280	3063	2688	2432	2231	1957
Females	1365	1364	1350	1310	1238	1237	1303	1268	1171	986	1038

Figure 5.2 Number of alcohol-related admissions to psychiatric hospitals reported to the NPIRS, 1995–2005

Source: NPIRS annual reports 1995–2005

It is now recognised that psychiatric inpatient units are inappropriate for treating the majority of people with alcohol problems. This is mirrored in the mental health policy *A vision for change*, which states that 'individuals whose primary problem is substance abuse and who do not have mental health problems will not fall within the remit of mental health services' (Expert Group on Mental Health 2006: 147). Given that there were 2,451 discharges from psychiatric units in 2005 with alcohol-related disorders and no co-morbidity, this policy, if adopted, will have serious implications for alcohol treatment services in Ireland.

NDTRS data were used to determine the numbers receiving treatment for problem alcohol use in Ireland and also to describe the characteristics of this cohort. Originally set up to record treated drug misuse, the scope of the NDTRS was extended in 2004 to include alcohol as it had become increasingly evident that alcohol, rather than illicit drugs, was the main problem substance in Ireland, and that a large proportion of cases used both alcohol and drugs (Long *et al.* 2004). In some parts of the country, particularly outside Dublin, alcohol and drug treatment services are integrated. A number of regional drugs task forces have identified a clear overlap between problem alcohol and drug use

and the need for treatment services that can address both substances. The exclusion of alcohol from reporting systems leads to an under-estimation of problem substance use and of the workload of addiction services.

For the purpose of the NDTRS, *treatment* is broadly defined as 'any activity that aims to ameliorate the psychological, medical or social state of individuals who seek help for their drug problems'. For the most part, alcohol and drug services in Ireland operate independently of each other. There is strong justification for combining both services; polydrug use occurs frequently, especially among young people, the clinical and scientific approach to treatment for both substances is similar, and, arguably, integrated services make more efficient and effective use of scarce resources.

The data presented in Table 5.1 indicate that half of all people recorded by the NDTRS in 2004 and 2005 reported alcohol as their main problem drug. Because, as yet, not all alcohol-treatment agencies are participating in the NDTRS, it can be assumed that this figure is an under-estimation of the true extent of problem alcohol use in Ireland.

Table 5.1 Number (%) reporting problem substance use to the NDTRS, 2004 and 2005

	Alcohol	Illicit drugs	Licit drugs
2004	5145 (49.9)	4823 (46.8)	346 (3.3)
2005	5527 (49.9)	5220 (47.1)	325 (2.9)

Of those reporting alcohol as their main problem drug in 2004 and 2005, 57% had never previously been treated for problem alcohol use. The main settings for treatment were outpatient (52%) and inpatient centres (48%). Table 5.2 presents a comparison of socio-economic and demographic characteristics between new cases and previously treated cases. The majority of cases receiving treatment were male (69.2%). Fifty per cent were under 39 years old and 3% were 18 years of age or under. Previously treated cases were more likely to be unemployed and in unstable accommodation. It is difficult to interpret whether long-standing alcohol problems lead to social disadvantage or whether failure to secure or retain employment and accommodation leads to a greater likelihood of developing chronic alcohol problems.

Table 5.2 Demographic and socio-economic characteristics of those who reported alcohol as their main problem drug, 2004 and 2005

	2004	2005
Median age (5th & 95th percentiles) in years		
All	38 (18–60)	39 (19–61)
New	35 (17–59)	36 (18–60)
Previously treated	42 (21–61)	41 (22–60)
Male cases n (%)		
All	3550 (69.2)	3823 (69.2)
New	1942 (68.7)	2210 (68.5)
Previously treated	1521 (69.8)	1561 (70.0)
Treatment status not known	97	52
Irish nationality n (%)		
All	4938 (96.0)	5283 (95.6)
New	2705 (95.7)	3091 (95.8)
Previously treated	2102 (96.5)	2127 (95.3)
Treatment status not known	131	65
Cases under 18 years old n (%)		
All	184 (3.6)	139 (2.5)
New	151 (5.3)	112 (3.5)
Previously treated	30 (1.4)	23 (1.0)
Treatment status not known	3	4
Cases left school early n (%)*		
All	704 (13.7)	833 (15.1)
New	386 (13.6)	497 (15.4)
Previously treated	302 (13.9)	331 (14.8)
Treatment status not known	16	5
Cases employed n (%)		
All	2001 (38.9)	2026 (36.7)
New	1222 (43.2)	1329 (41.2)
Previously treated	741 (34.0)	678 (30.4)
Treatment status not known	38	19
Cases in unstable accommodation n (%)		
All	441 (8.6)	551 (10.0)
New	165 (5.8)	167 (5.2)
Previously treated	256 (11.7)	370 (16.6)
Treatment status not known	20	14

*Under 15 years of age

The average national rate per 10,000 of the 15–64-year-old population reporting alcohol as their main problem drug to the NDTRS for 2004 and 2005 was 10.4. There are large discrepancies between counties in the incidence of treatment seeking; these can be explained by variations in reporting practices. Carlow had the highest incidence of treatment seeking for problem alcohol use, with an

average incidence of 41.2, while Mayo had the lowest, with an incidence of 1.3 (Figure 5.3). Coverage by the NDTRS of people reporting alcohol as their main problem drug is incomplete in the East and West of Ireland, which is reflected in Figure 5.3. It is hoped that this situation will improve from 2007 onwards, as NDTRS staff are completing a service inventory and are recruiting services which have not participated to date.

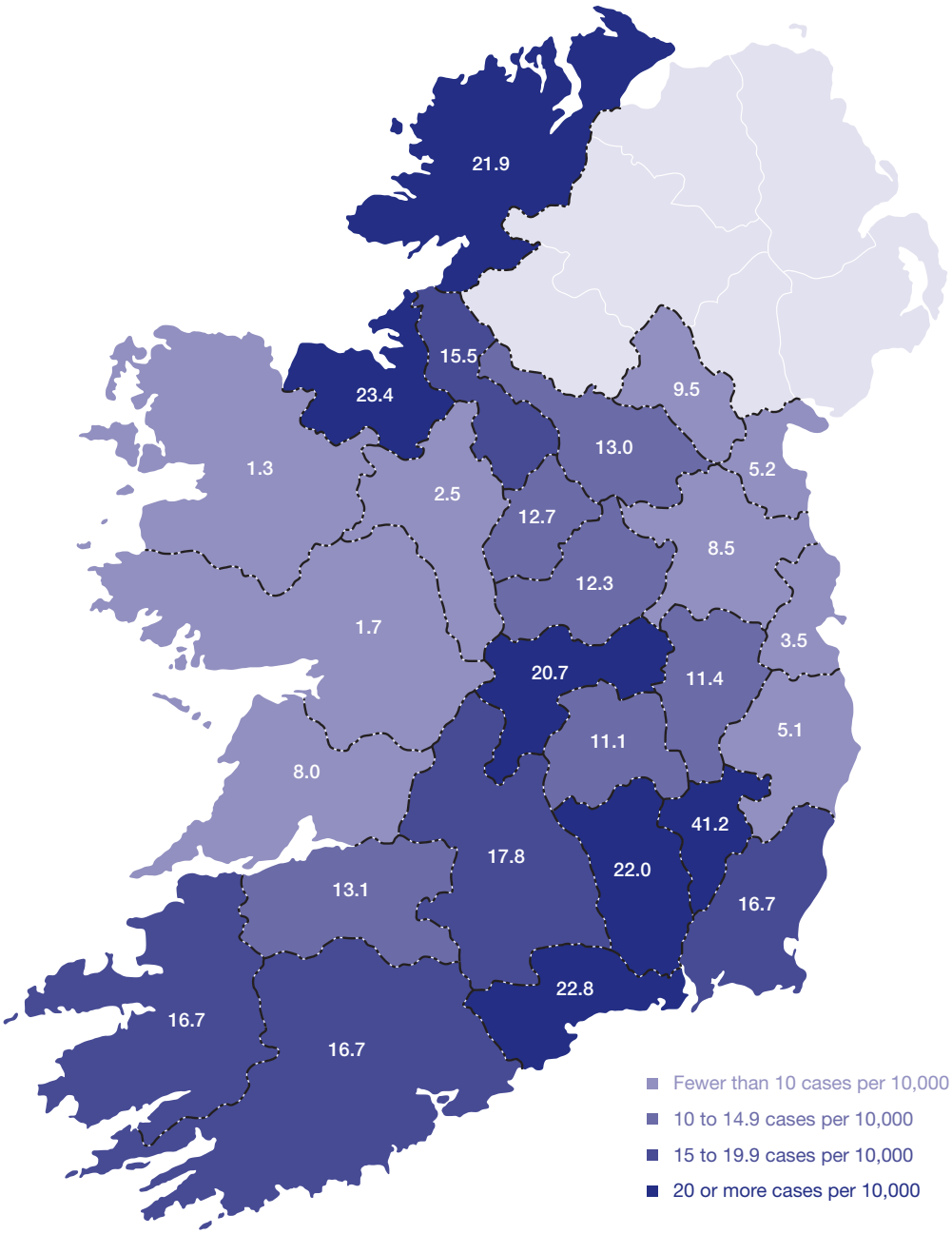


Figure 5.3 Average annual incidence of treatment seeking per 10,000 of the 15–64-year-old population in Ireland, reported to the NDTRS, 2004–2005

One in five receiving treatment for alcohol use in 2004 and 2005 reported problem use of at least one other drug, with over 10% and over 5% reporting problem use of two and three additional drugs respectively (Table 5.3). Cannabis was the most common additional drug used, with 16.6% receiving

treatment for its use in 2005, followed by stimulants, which were used by 9.4%. Of particular concern is the increase of 45% between 2004 and 2005 in the number receiving treatment for both cocaine and alcohol use. Co-use of alcohol and cocaine leads to the formation of cocaethylene which may potentiate the cardiotoxic effects of cocaine or alcohol alone. Additionally, this combination can increase the tendency towards violent thoughts and threats, which may lead to an increase of violent behaviours (Pennings *et al.* 2002).

Table 5.3 Use of additional drugs by people receiving alcohol treatment, reported to the NDTRS, 2004 and 2005

Additional drugs used	2004 n (%)	2005 n (%)
Use of any additional drug	1051 (20.4)	1170 (21.2)
Use of two additional drugs	549 (10.7)	602 (10.9)
Use of three additional drugs	273 (5.3)	316 (5.7)
Total number treated	**5145**	**5527**
Cannabis	813 (15.8)	920 (16.6)
Stimulants	508 (9.9)	522 (9.4)
Cocaine	273 (5.3)	397 (7.2)
Hypnotics & Sedatives	96 (1.9)	114 (2.1)
Opiates	108 (2.1)	96 (1.7)
Hallucinogens	36 (0.7)	22 (0.4)
Volatile inhalants	15 (0.3)	8 (0.1)
Others	24 (0.5)	9 (0.2)

Polydrug use presents challenges to drug treatment and monitoring systems that traditionally have focused on the use of individual substances. In Ireland there are no official links between alcohol and drug treatment services, but in practice many drug services also treat clients with problem alcohol use. Polydrug users were more likely to be male and attending treatment for the first time, compared to those receiving treatment for alcohol only, but these differences were minor. There was a noticeable difference in the age profile of the two groups, with polydrug users being much younger. Under-18s accounted for 8.4% of polydrug users, but for just 1.6% of those receiving treatment for alcohol only (Figure 5.4).

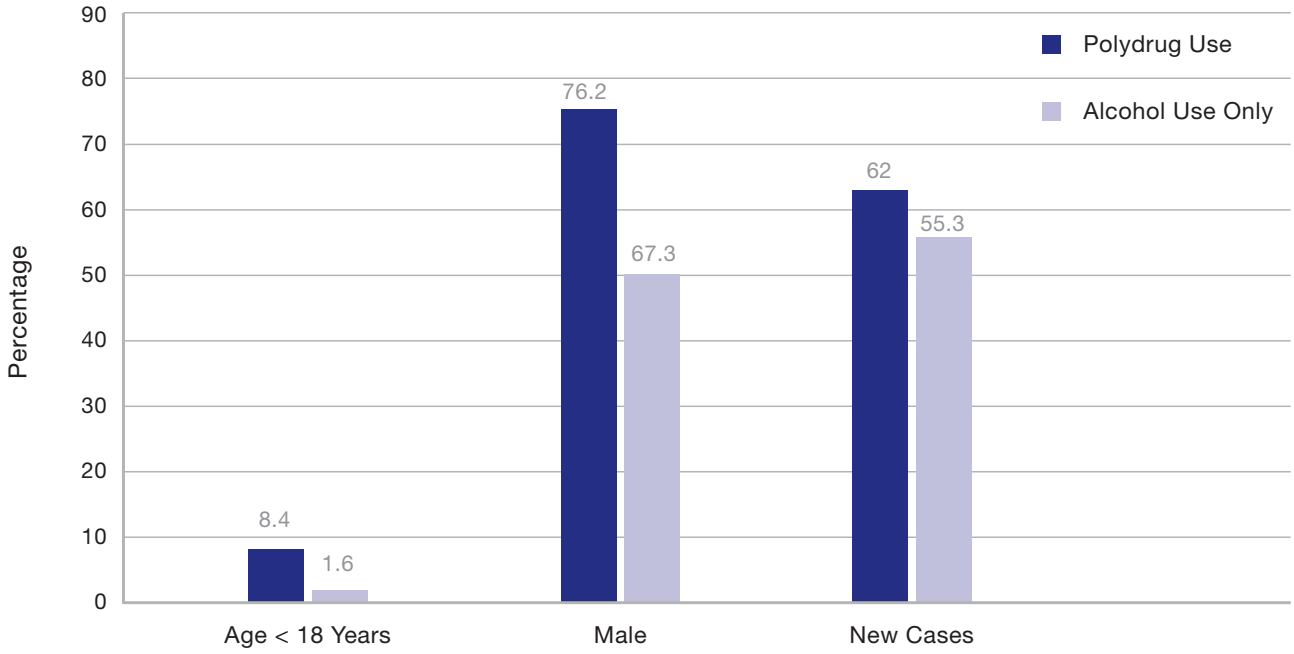


Figure 5.4 Characteristics of polydrug users compared to alcohol-only users reported to the NDTRS, 2004–2005

Table 5.4 describes the types of treatment received by those with problem alcohol use. Counselling was the most common treatment, with approximately four out of five receiving this type of treatment. This was followed by medication-free therapy, which was provided to an average of 34.3% of treatment users in 2004 and 2005. In the case of alcohol detoxification, there were differences in treatment between new and previously treated cases. Detoxification was more prevalent among previously treated cases, with 36.5% of these cases receiving detoxification, compared to an average of 26.4% of new cases.

Table 5.4 Type of treatment received by those reporting alcohol as their main problem drug, 2004 and 2005

Type of treatment received	2004 n (%)	2005 n (%)
Alcohol detoxification		
All	1703 (33.1)	1580 (28.6)
New	805 (28.5)	794 (24.6)
Previously treated	841 (38.6)	770 (34.5)
Treatment status not known	57	16
Brief intervention		
All	719 (14.0)	1119 (20.2)
New	443 (15.7)	672 (20.8)
Previously treated	261 (12.0)	431 (19.3)
Treatment status not known	15	16
Medication-free therapy		
All	1822 (35.4)	1841 (33.3)
New	1008 (36.1)	1112 (34.4)
Previously treated	797 (36.6)	708 (31.7)
Treatment status not known	17	21
Counselling		
All	4167 (81.0)	4365 (79.0)
New	2228 (78.8)	2521 (78.1)
Previously treated	1822 (83.7)	1795 (80.5)
Treatment status not known	117	49
Psychiatric treatment		
All	220 (4.3)	232 (4.2)
New	107 (3.8)	115 (3.6)
Previously treated	105 (4.8)	117 (5.2)
Treatment status not known	8	1
Social and/or occupational integration		
All	899 (17.5)	837 (15.1)
New	507 (17.9)	502 (15.6)
Previously treated	342 (15.7)	328 (14.7)
Treatment status not known	50	7
Alternative treatment		
All	0	19 (0.3)
New		18 (0.6)
Previously treated		1 (0.0)
Treatment status not known		

6 Conclusion

Ireland has one of the highest levels of alcohol consumption in Europe and, in 2006, 13.36 litres of pure alcohol were consumed for every adult aged 15 or over. In spite of its popularity, it should be remembered that alcohol is a dangerous drug, and that it is responsible for more harm than other psychoactive substances. Alcohol is associated with a range of chronic and acute medical conditions, including liver cirrhosis, various cancers, road traffic accidents and suicide. It is the third highest risk factor for all burden of disease in developed countries and is estimated to cause the deaths of 195,000 people a year in the European Union.

Alcohol-related harm is very much correlated with alcohol consumption. Alcohol-related morbidity peaked in 2002 and alcohol-related mortality in 2001, the two years of highest alcohol consumption in Ireland. Problem alcohol use is not confined to any one segment of Irish society. The negative effects of alcohol are far reaching and affect men and women and old and young alike. A large proportion of young people in Ireland drink, many to the extent of binge drinking. This can impair brain development, increase the likelihood of developing alcohol dependency and increase the risk of suffering unintentional injuries. The HIPE data show that between 1995 and 2004, 17% of male and 25% of female discharges with alcohol-related conditions were aged under 30. While drinking alcohol is a matter of individual choice and responsibility, it should also be a matter of collective responsibility to limit the harms that arise from its use.

The data presented in this overview indicate that there is a need for:

- The implementation of the recommendations of the Strategic Task Force on Alcohol reports. These reports present a number of evidence-based strategies with a strong public health bases to reduce the harms caused by problematic alcohol use. International evidence supports alcohol taxation, regulating the physical availability of alcohol and drink-driving countermeasures as effective strategies for reducing alcohol consumption and related harm. Measures that are considered ineffective include education in schools, public service announcements and voluntary regulation by the alcohol industry. These should only be used as part of comprehensive strategy to reduce alcohol-related harm.
- A delay in the initiation to drinking among young people. It is important to decrease the easy access and availability of alcohol to young people and to increase the provision of alternative alcohol-free social activities.
- Accurate and complete data on the numbers receiving treatment for alcohol use. This involves continued expansion of the NDTRS. It is also important to have accurate data on people being treated for problem alcohol use who also have psychiatric co-morbidity, which will be possible with the roll-out of the combined NPIRS and COMCAR (Community Care) mental health information system.
- Greater integration of alcohol and drug treatment services. One in five people receiving treatment for problem alcohol use also reports problem use of at least one other drug, and this is especially common among younger people.

- Screening and brief intervention to provide early intervention for hazardous or harmful drinkers, to moderate consumption to sensible levels and to eliminate harmful drinking practices. Primary care and accident and emergency departments have both been identified as appropriate settings for screening and providing brief intervention to those with harmful drinking patterns.
- A strong health promotion campaign to inform and educate women about the dangers of alcohol, especially during pregnancy.
- Data on people with alcohol-related conditions who attend accident and emergency units but are not admitted to hospital in order to determine the real burden of alcohol to hospitals.
- Accurate data on alcohol-related deaths, including those where alcohol was a contributory factor. This will soon be feasible as the National Drug-Related Deaths Index (NDRDI) is currently being compiled and is collecting data on all alcohol-related deaths from 1998 onwards.

References

American Medical Association (AMA) (2002) *Harmful consequences of alcohol use on the brains of children, adolescents, and college students.* Summary report. Retrieved 14/9/2007 from www.ama-assn.org/ama1/pub/upload/mm/388/harmful_consequences.pdf

Anderson P and Baumberg B (2006) *Alcohol in Europe: a public health perspective.* London: Institute of Alcohol Studies.

Anderson R, Collins C, Dalton Y, Doran G and Boland M (2006) *Alcohol aware practice service initiative - final report.* Dublin: Health Service Executive.

Baer J, Sampson P, Barr H, Connor P and Streissguth A (2003) A 21-year longitudinal analysis of the effects of prenatal alcohol exposure on young adult drinking. *Archives of General Psychiatry,* 60: 377–385.

Ballesteros J, Duffy J, Querejeta I, Arino J and Gonzales-Pinto A (2004) Efficacy of brief interventions for hazardous drinkers in primary care: systematic review for meta-analysis. *Alcoholism: Clinical and Experimental Research,* 28: 608–618.

Barry S, Kearney A, Lawlor E, McNamee E and Barry J (2006) *The Coombe Women's Hospital study of alcohol, smoking and illicit drug use*, *1988–2005.* Dublin: Coombe Women's Hospital.

Bedford D, O'Farrell A and Howell F (2006a) Blood alcohol levels in persons who died from accidents and suicide. *Irish Medical Journal,* 99: 80-3.

Bedford D, McKeown N, Vellinga A and Howell F (2006b) *Alcohol in fatal road crashes in Ireland in 2003.* Naas, Co Kildare: Population Health Directorate, Health Service Executive.

Borkenstein R, Crowther R, Shumate R Ziel, W and Zylman R (1974) The role of the drinking driver in traffic accidents. *Blutalkohol*, 11 (Suppl. 1): 1–134.

Bruun K, Edwards G, Lumio M, Mäkelä K, Pan L, Popham R *et al.* (1975) *Alcohol control policies in public health perspective.* Helsinki: The Finnish Foundation for Alcohol Studies.

CDC (2002) Fetal alcohol syndrome - Alaska, Arizona, Colorado, and New York, 1995-1997. *Morbidity and Mortality Weekly Review,* 51: 433-435.

Corrao G, Rubbiati L and Bagnardi V (2000) Alcohol and coronary heart disease: A meta-analysis. *Addiction,* 95: 1505–1523.

Coulton S, Drummond C, Godfrey C, Bland J, Parrot S and Peters T (2006) Opportunistic screening for alcohol use disorders in primary care: comparative study. *British Medical Journal,* 332: 511–517.

Crawford M, Patton R, Touquet R, Drummond C, Byford S, Barret B, Reece B, Brown A and Henry J (2004) Screening and referral for brief intervention of alcohol-misusing patients in an emergency department: a pragmatic randomised controlled trial. *Lancet,* 364: 1334–1339.

Daly A, Walsh D, Ward M and Moran R (2006) *Activities of Irish psychiatric units and hospitals 2005.* Dublin: Health Research Board.

Dantzer C, Wardle J, Fuller R, Pampalone S and Steptoe A (2006) International study of heavy drinking: attitudes and sociodemographic factors in university students. *Journal of American College Health,* 55: 83–89.

Department of Health and Children (2007) *Minister Gallagher renews advice to women not to drink alcohol in pregnancy.* Press release, 7 September. Retrieved 12/09/2007 from http://www.dohc.ie/press/releases/2007/20070907.html.

Department of Health (1984) *The psychiatric services: planning for the future.* Dublin: Stationery Office.

Department of Health and Children (2002) *Traveller health – a national strategy 2002–2005.* Dublin: Department of Health and Children.

Department of Public Health (2001) *Suicide in Ireland*. A national study. Departments of public health on behalf of the chief executive officers of the health boards.

Department of Tourism, Sport and Recreation (2001) *Building on experience: National Drugs Strategy 2001–2008.* Dublin: Stationery Office.

DHSSPS (2006) New strategic direction for alcohol and drugs 2006–2011. Belfast: Department of Health, Social Services and Public Safety.

Eckardt M, File S, Gessa G, Grant K, Guerri C, Hoffman P, Kalant H, Koob G, Li T and Tabakoff B (1998) Effects of moderate alcohol consumption on the central nervous system. *Alcoholism: Clinical and Experimental Research,* 22: 998–1040.

Edwards G, Marshall E and Cook CC (2003) *The treatment of drinking problems.* 4th Edition. Cambridge University Press.

Emanuele M, Wezeman F and Emanuele N (2002) Alcohol's effects on female reproductive function. *Alcohol Research and Health,* 26: 274–281.

EMCDDA (2006) *Annual report 2006: selected issues.* Luxembourg: Office for Official Publications of the European Communities.

Expert Group on Mental Health Policy (2006) *A vision for change.* Dublin: Stationery Office.

Fountain J (2006) *An overview of the nature and extent of illicit drug use amongst the Traveller community: an exploratory study.* Dublin: Stationery Office.

Gorwood P (2001) Biological markers for suicidal behaviour in alcohol dependence. *European Psychiatry,* 16: 410-417

Grant BF and Dawson DA (1997) Age of onset of alcohol use and its association with DSM–IV alcohol abuse and dependence: Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of Substance Abuse,* 9: 103–110.

Greene E, Bruce I, Cunningham C, Coakley D and Lawlor BA (2003) Self-reported alcohol consumption in the Irish community dwelling elderly. *Irish Journal of Psychological Medicine,* 20: 77–79.

Health Promotion Unit (1996) *National alcohol policy.* Dublin: Department of Health.

Hibell B, Andersson B, Ahlström S, Balakireva O, Bjarnasson T, Kokkevi A *et al.* (2000) *The 1999 ESPAD report: alcohol and other drug use among students in 30 European countries.* Stockholm: The Swedish Council for Information on Alcohol and Other Drugs, CAN and the Council of Europe, Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group).

Hibell B, Andersson B, Bjarnasson T, Ahlström S, Balakireva O, Kokkevi A *et al.* (2004) *The ESPAD report 2003: alcohol and other drug use among students in 35 European countries.* Stockholm: The Swedish Council for Information on Alcohol and Other Drugs, CAN and the Council of Europe, Co-operation Group to Combat Drug Abuse and Illicit Trafficking in Drugs (Pompidou Group).

Hope A, Dring C and Dring J (2005) *The health of Irish students.* College lifestyle and attitudinal national (CLAN) survey. Dublin: Department of Health and Children, 1–53.

Hope A, Gill A, Costello G, Sheehan J, Brazil E and Reid V (2005) *Alcohol and injuries in the accident and emergency department - a national perspective.* Dublin: Department of Health and Children.

Hulse GK, White J and Cape G (eds) (2002) *Management of alcohol and drug problems.* Oxford University Press.

Inskip H, Harris E and Barraclough B (1998) Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *British Journal of Psychiatry, 35-37.*

Institute of Medicine (1990) *Broadening the base of treatment for alcohol problems.* Washington DC: National Academies Press, Figure 9.1.

IWS (Irish Water Safety) (2007) *Your life may be at risk on open water this weekend.* Press release, 31 May. Retrieved 29/06/2007 from www.iws.ie/press-releases-page34993.html

Johnson I (2000) Alcohol problems in old age: a review of recent epidemiological research. *International Journal of Geriatric Psychiatry,* 15: 575–581.

Joint Committee on Health and Children (2004) *Report on alcohol misuse by young people.* Dublin: Houses of the Oireachtas.

Kelleher C, Nic Gabhainn S, Friel S, Corrigan H, Nolan G, Sixsmith J *et al.* (2003) The national health & lifestyle surveys: survey of lifestyle, attitudes and nutrition (SLAN) & the Irish health behaviour in school-aged children survey (HBSC). Galway: National University of Ireland.

Kennedy HG, Monks S, Curtin K, Wright B, Linehan SA, Duffy DM, Teljeur C and Kelly A (2005) *Mental illness in Irish prisoners: psychiatric morbidity in sentenced, remanded and newly committed prisoners.* Dublin: National Forensic Mental Health Service.

Kesmodel U, Wisborg K, Olsen S, Henriksen T and Secher N (2002) Moderate alcohol intake during pregnancy and the risk of stillbirth and death in the first year of life. *American Journal of Epidemiology,* 155: 305–312.

Lawless M and Corr C (2005) *Drug use among the homeless population in Ireland.* Dublin: Stationery Office.

Leon D and McCambridge J (2006) Liver cirrhosis mortality rates in Britain 1950 to 2002: an analysis of routine data. Lancet, 357: 52–56.

Linehan SA, Duffy DM, Wright B, Curtin K, Monks S and Kennedy HG (2005) Psychiatric morbidity in a cross-sectional sample of male remanded prisoners. *Irish Journal of Psychological Medicine,* 22: 128–132.

Long (2006) New mental health policy distances its link with the addiction services. *Drugnet Ireland,* 18: 9.

Long J, Jackson T, Kidd M, Kelleher T and Sinclair H (2004) *Treatment demand for problem alcohol use in the South Eastern and Southern Health Board areas, 2000–2002.* Occasional Paper No. 10. Dublin: Health Research Board.

Mazzaglia G, Britton A, Altmann D and Chenet L (2001) Exploring the relationship between alcohol consumption and non-fatal or fatal stroke: a systemic review. *Addiction,* 96: 1743–1756.

McMillan H, Smaarani S, Walsh T, Khawaja N, Collins C, Byrne P and Geary M (2006) Smoking and

alcohol in pregnancy. Survey in the immediate post-partum period. *Irish Medical Journal, 99:*

National Registry of Deliberate Self Harm (2005) *Annual Report*. National Suicide Research Foundation.

Nic Gabhainn S, Kelly C and Molcho M (2007) *The Irish health behaviour in school-aged children (HBSC) study 2006.* Dublin: Department of Health and Children.

O'Connor M and Whaley S (2007) Brief intervention for alcohol use by pregnant women. *American Journal of Public Health*, 97: 252-258.

Pennings E, Leccese AP and Wolff F (2002) Effects of concurrent use of alcohol and cocaine. *Addiction*, 7: 773–783.

Poschl G and Seitz H (2004) Alcohol and cancer. *Alcohol and Alcoholism,* 39(3): 155–165.

Raistrick D, Heather N, Godfrey C (2006) *Review of the effectiveness of treatment for alcohol problems.* London: National Treatment Agency for Substance Misuse.

Ramstedt M and Hope A (2005) The Irish drinking habits of 2002: drinking and drinking-related harm in a European comparative perspective. *Journal of Substance Use,* 10: 273–283.

Rehm J, Greenfield TK and Rogers J (2001) Average volume of alcohol consumption, patterns of drinking, and all-cause mortality: results from the US national alcohol survey. *American Journal of Epidemiology,* 133: 63–71.

Rehm J, Room R, Graham K, Monteiro M, Gmel G and Sempos CT (2003) The relationship of average volume of alcohol consumption and patterns of drinking to burden of disease: An overview. *Addiction,* 98: 1209–1228.

Rehm J, Taylor B and Patra J (2006) Volume of alcohol consumption, patterns of drinking and burden of disease in the European region 2002. *Addiction,* 101: 1086–1095.

Rundle K, Leigh C, McGee H and Layte R (2004) *Irish contraception and crisis pregnancy study: A survey of the general population.* Dublin: Crisis pregnancy agency.

Sayal K, Heron J, Golding J and Emond A (2007) Prenatal alcohol exposure and gender differences in childhood mental health problems: a longitudinal population-based study. *Pediatrics,* 119: 426–434.

Seitz H and Homan N (2001) *Effect of alcohol on the orogastrointestinal tract, the pancreas and the liver. In: International handbook of alcohol problems and dependence.* West Sussex, UK: John Wiley & Sons Ltd.

Shults R, Elder R, Sleet D, Nichols J, Alao M, Carande-Kulis V *et al.* (2001) Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine,* 21 (Suppl. 1): 66–88.

Smith-Warner S, Spiegelman D, Yaun S, van den Brandt P, Folsom A, Goldbohm R *et al.* (1998) Alcohol and breast cancer in women: a pooled analysis of cohort studies. *Journal of the American Medical Association.* 279: 535–540.

Sood B, Delaney-Black V, Covington C, Nordstrom-Klee B, Ager J, Templin T *et al.* (2001) Prenatal alcohol exposure and childhood behaviour at age 6 to 7 years: I. Dose-response effect. *Pediatrics,* 108(2): 1–9.

Steering Group for the Mid-term Review of the National Drugs Strategy (2005) *Mid-term review of the National Drugs Strategy 2001–2008.* Dublin: Department of Community, Rural and Gaeltacht Affairs.

Strategic Task Force on Alcohol (2002) *Interim report.* Dublin: Department of Health and Children.

Strategic Task Force on Alcohol (2004) *Second report.* Dublin: Department of Health and Children.

Streissguth A and O'Malley K (2000) Neuropsychiatric implications and long-term consequences of fetal alcohol spectrum disorders. *Seminars in Clinical Neuropsychiatry,* 5: 177–190.

TNS Opinion & Social (2007) *Attitudes towards alcohol*. Special Eurobarometer 272. Brussels: European Commission.

Toumbourou J, Stockwell T, Neighbors C, Marlatt G, Sturge J and Rehm J (2007) Interventions to reduce harm associated with adolescent substance use. *Lancet,* 369: 1391–1401.

Whitlock E, Polen M, Green C, Orleans T and Klein J (2004) Behavioural counselling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the US Preventive Services Task Force. *Annals of Internal Medicine,* 140: 557–568.

WHO (1993) *International statistical classification of disease and health-related problems - ICD 10.* Geneva: World Health Organization.

WHO (1994) *Lexicon of alcohol and drug terms.* Geneva: World Health Organization.

WHO (2002) *The world health report 2002: reducing risks, promoting healthy life.* Geneva: World Health Organization.

Willford J, Leech S and Day N (2006) Moderate prenatal alcohol exposure and cognitive status of children at age 10. *Alcoholism: Clinical and Experimental Researc`h,* 30: 1051-1059.

Appendices

Appendix 1A – ICD-9-CM codes extracted to calculate alcohol-related morbidity

Code	Mental and behavioural disorders due to use of alcohol
291.0	Alcohol withdrawal delirium
291.1	Alcohol amnestic syndrome
291.2	Other alcoholic dementia
291.3	Alcohol withdrawal hallucinations
291.4	Idiosyncratic alcohol intoxication
291.5	Alcoholic jealousy
291.8	Other specified alcoholic psychosis
291.81	Alcohol withdrawal
291.89	Other 'other specified alcoholic psychosis'
291.9	Unspecified alcohol-induced mental disorders
	Dependent use of alcohol
303.0	Acute alcoholic intoxication
303.1	Alcohol dependence syndrome continuous
303.2	Alcohol dependence syndrome episodic
303.3	Alcohol dependence syndrome in remission
303.9	Other and unspecified alcohol dependence
303.00	Acute alcoholic intoxication unspecified
303.01	Acute alcoholic intoxication continuous
303.02	Acute alcoholic intoxication episodic
303.03	Acute alcoholic intoxication in remission
303.90	Other and unspecified alcohol dependence unspecified
303.91	Other and unspecified alcohol dependence continuous
303.92	Other and unspecified alcohol dependence episodic
303.93	Other and unspecified alcohol dependence in remission
	Non-dependent use of alcohol
305.0	Alcohol abuse
305.00	Alcohol abuse unspecified
305.01	Alcohol abuse continuous
305.02	Alcohol abuse episodic
305.03	Alcohol abuse in remission

	Alcohol disorders – Other
265.2	Pellagra
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
535.30	Alcoholic gastritis with no haemorrhage
535.31	Alcoholic gastritis with haemorrhage
	Alcoholic liver disease
571.0	Alcoholic fatty liver
571.1	Alcoholic hepatitis
571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver disease, unspecified
	Poisoning (E-codes normally reported in conjunction with another diagnosis code)
E860.0	Accidental poisoning by alcohol (alcohol beverages)
E860.9	Accidental poisoning by alcohol (unspecified)
E950.9	Suicide and self-inflicted poisoning by other and unspecified solid and liquid substances
E980.9	Poisoning by other and unspecified solid or liquid substances, undetermined intent
	Problems associated with prenatal alcohol use
760.71	Fetal alcohol syndrome
	Evidence of alcohol involvement determined by blood alcohol level
790.3	Excessive blood alcohol level of alcohol
	Toxic effect of alcohol
980.0	Toxic effect of ethyl alcohol
980.1	Toxic effect of methyl alcohol
980.2	Toxic effect of isopropyl alcohol
980.3	Toxic effect of fusel oil
980.8	Toxic effect of specified alcohols
980.9	Toxic effect of unspecified alcohol

Appendix 1B – Categories of ICD-9-CM alcohol-related morbidity codes

Code	Chronic alcohol conditions
291.0	Alcohol withdrawal delirium
291.1	Alcohol amnestic syndrome
291.2	Other alcoholic dementia
291.3	Alcohol withdrawal hallucinations
291.4	Idiosyncratic alcohol intoxication
291.5	Alcoholic jealousy
291.8	Other specified alcoholic psychosis
291.81	Alcohol withdrawal
291.89	Other 'other specified alcoholic psychosis'
291.9	Unspecified alcohol-induced mental disorders
303.0	Acute alcoholic intoxication
303.1	Alcohol dependence syndrome continuous
303.2	Alcohol dependence syndrome episodic
303.3	Alcohol dependence syndrome in remission
303.9	Other and unspecified alcohol dependence
303.00	Acute alcoholic intoxication unspecified
303.01	Acute alcoholic intoxication continuous
303.02	Acute alcoholic intoxication episodic
303.03	Acute alcoholic intoxication in remission
303.90	Other and unspecified alcohol dependence unspecified
303.91	Other and unspecified alcohol dependence continuous
303.92	Other and unspecified alcohol dependence episodic
303.93	Other and unspecified alcohol dependence in remission
265.2	Pellagra
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
535.30	Alcoholic gastritis with no haemorrhage
535.31	Alcoholic gastritis with haemorrhage
	Alcoholic related liver disease and cirrhosis
571.0	Alcoholic fatty liver
571.1	Alcoholic hepatitis
571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver disease, unspecified

	Acute conditions
305.0	Alcohol abuse
305.00	Alcohol abuse unspecified
305.01	Alcohol abuse continuous
305.02	Alcohol abuse episodic
305.03	Alcohol abuse in remission
E860.0	Accidental poisoning by alcohol (alcohol beverages)
E860.9	Accidental poisoning by alcohol (unspecified)
E950.9	Suicide and self-inflicted poisoning by other and unspecified solid and liquid substances
E980.9	Poisoning by other and unspecified solid or liquid substances, undetermined intent
790.3	Excessive blood alcohol level of alcohol
980.0	Toxic effect of ethyl alcohol
980.1	Toxic effect of methyl alcohol
980.2	Toxic effect of isopropyl alcohol
980.3	Toxic effect of fusel oil
980.8	Toxic effect of specified alcohols
980.9	Toxic effect of unspecified alcohol
	Problems associated with prenatal alcohol use
760.71	Fetal alcohol syndrome

Appendix 2A – ICD-9-WHO codes extracted to measure alcohol-related mortality

Code	Mental and behavioural disorders due to use of alcohol
291	Alcohol psychoses
291.0	Alcohol withdrawal delirium
291.1	Alcohol-induced persisting amnestic disorder
291.2	Alcohol-induced persisting dementia
291.3	Alcohol-induced psychotic disorder with hallucinations
291.4	Idiosyncratic alcohol intoxication
291.5	Alcohol-induced psychotic disorder with delusions
291.8	Other specified alcohol-induced mental disorders
291.9	Unspecified alcohol-induced mental disorders
303	Alcohol dependence syndrome
303.0	Acute alcoholic intoxication
303.9	Other and unspecified alcohol dependence
305.0	Alcohol abuse
	Alcohol disorders –Other
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
535.3	Alcoholic gastritis
265.2	Pellagra
	Alcoholic liver disease
571.0	Alcoholic fatty liver
571.1	Alcoholic hepatitis
571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver disease, unspecified
	Poisoning
E860.0	Accidental poisoning by alcohol (alcohol beverages)
E860.9	Accidental poisoning by alcohol (unspecified)
E950.9	Suicide and self-inflicted poisoning by other and unspecified solid and liquid substances
E980.9	Poisoning by other and unspecified solid or liquid substances, undetermined intent
	Problems associated with prenatal alcohol use
760.71	Fetal alcohol syndrome
	Evidence of alcohol involvement determined by blood alcohol level
790.3	Excessive blood alcohol level of alcohol
	Toxic effect of alcohol
980.0	Toxic effect of ethyl alcohol
980.9	Toxic effect of unspecified alcohol

Appendix 2B – Categories of ICD-9-WHO alcohol-related mortality codes

291	Alcohol psychoses
291.0	Alcohol withdrawal delirium
291.1	Alcohol-induced persisting amnestic disorder
291.2	Alcohol-induced persisting dementia
291.3	Alcohol-induced psychotic disorder with hallucinations
291.4	Idiosyncratic alcohol intoxication
291.5	Alcohol-induced psychotic disorder with delusions
291.8	Other specified alcohol-induced mental disorders
291.9	Unspecified alcohol-induced mental disorders
303	Alcohol dependence syndrome
303.0	Acute alcoholic intoxication
303.9	Other and unspecified alcohol dependence
305.0	Alcohol abuse
357.5	Alcoholic polyneuropathy
425.5	Alcoholic cardiomyopathy
	Alcoholic-related liver disease and cirrhosis
571.0	Alcoholic fatty liver
571.1	Alcoholic hepatitis
571.2	Alcoholic cirrhosis of liver
571.3	Alcoholic liver disease, unspecified
	Acute conditions
980.0	Toxic effect of ethyl alcohol
980.9	Toxic effect of unspecified alcohol
790.3	Excessive blood alcohol level of alcohol
E860.0	Accidental poisoning by alcohol (alcohol beverages)
E860.9	Accidental poisoning by alcohol (unspecified)
E950.9	Suicide and self-inflicted poisoning by other and unspecified solid and liquid substances
E980.9	Poisoning by other and unspecified solid or liquid substances, undetermined intent
	Problems associated with prenatal alcohol use
760.71	Fetal alcohol syndrome

Authors' contact details

Deirdre Mongan

Research Officer
Alcohol and Drug Misuse Unit
Health Research Board
Knockmaun House
42–47 Lower Mount Street
Dublin 2
t (01) 2345127
f (01) 6618567
e deirdrem@hrb.ie

Siobhán Reynolds

Research Analyst
Alcohol and Drug Misuse Unit

Sarah Fanagan

Research Analyst
Alcohol and Drug Misuse Unit

Jean Long

Head of Unit
Alcohol and Drug Misuse Unit

Health Research Board