NORTH WEST ALCOHOL INFORMATION

FACT SHEET 1:

TOLERANCE AND PERCEPTIONS OF DRINKING

MICHELA MORLEO, PENNY PHILLIPS-HOWARD, PENNY A COOK, MARK A BELLIS

KEY POINTS

- **People's perceptions of their own drinking are based on underestimates of own intake, lack of knowledge of harms and inflated belief of benefits.**
- **Understandings of problems relating to alcohol are based on the extreme behaviours of others, for example in anti-social behaviour at night in town centres, which can lead to people avoiding these areas, rather than the long-term health impacts of alcohol.**
- **The public define moderate drinking as not getting overtly drunk. This equates to a higher maximum consumption level than that advised by Government guidelines. Occasional binge drinking is not seen as being as harmful as frequent drinking.**
- **There is the perception that moderate consumption protects from heart disease, however any effects are limited to older age groups. In addition, so-called protective levels of consumption increase the risk of liver cirrhosis, cancer and other conditions.**
- **Delivering an effective alcohol message is complicated by these perceptions as well as overt industry marketing to maintain sales. Thus, communication strategies, such as in education and the media, have limited effect.**
- **American estimates show that a complete ban on alcohol advertising could reduce alcohol-related years of life lost by 16.4%.**
- **Effective interventions to reduce harm are reported in the other six Fact Sheets of this series and include lowering the drink-drive limit, price increases and restricted outlet density.**

1. INTRODUCTION

This Fact Sheet examines public tolerance and perceptions of alcohol and harm before reviewing the evidence on the true alcohol burden. It then highlights the effect of interventions (such as education) that aim to change tolerance and perceptions, which are discussed in more detail in the accompanying Fact Sheets.

1.1 PERCEPTIONS

Research on perceptions of consumption and related harm is rare. However, American studies have highlighted common perceptions and misconceptions (Table 1). Overall, individuals perceive alcohol to be less risky than it is, and do not recognise the harms that may arise even from low levels of consumption. Further, individuals underestimate the amount they drink themselves not only through overestimating the definitions of moderate drinking (thus allowing them to drink more), but also because they may not correctly perceive how much they are drinking. This is due to a general inclination to underestimate consumption:[1] self-reported estimates through national surveys such as the General Household Survey historically have shown overall national consumption levels which are lower than those estimated through tax revenues.[2,3] Such

perceptions may be influenced by industry marketing strategies aiming to encourage alcohol sales. Advertising targets consumer preferences and appeals to sophisticated life-styles, using celebrities, music, characters, story, and humour.[4] The presence of two competing agendas (one to sell alcohol and another to protect against the harmful effects of alcohol) may confuse audiences and make it more difficult to transmit health-related messages.

1.2 TOLERANCE

Whilst individuals do not often appear to recognise the negative effects of their own consumption (Section 1.1), consensus does exist amongst the general population, the Government and medical experts that alcohol causes or is involved in societal harms.[8-11] British Crime Surveys (BCS) between 1992 and 2004/5 show the percentage of people witnessing drunkenness and antisocial behaviour by young people in public places has increased from 27 to 31%.[12]

TABLE 1: COMMON PERCEPTIONS SURROUNDING ALCOHOL IN AMERICA

Topic	Perceptions
Definition of moderate drinking	• Moderate drinking is not getting overtly drunk (the exact level varies by individual).[5] • Moderate drinking is controlled, and so prevents negative consequences.[5]
Recognition of problem drinking	• Individuals do not see themselves as at risk of alcoholism.[5] • Frequency of consumption is more harmful than quantity.[5]
Impact of alcohol	• Red wine is beneficial regardless of the amount consumed.[5,6] • Individuals are more likely to ignore long-term risks than the short-term.[5] • There is a tendency to overestimate the number of deaths due to rare causes, but underestimate the number of deaths due to more common causes.[7] (This may lead individuals to underestimate the negative impacts of alcohol on health.)

The perceived link with alcohol is particularly strong for crime: for example, nearly half (46%) of BCS participants who had experienced violence perceived the offender(s) to be under the influence of alcohol.[13] Despite this, alcohol is perhaps more tolerated by the general population compared with other drugs:

- Using and misusing alcohol has become increasingly acceptable;[10]
- Nearly a third (30%) of 15 year olds think it is acceptable to get drunk once a week;[14]
- Over half (55%) of 11-15 year olds think their parents would have a tolerant attitude towards their drinking (2% for smoking);[14]
- For young people particularly, drunkenness is evidence of a good night out;[10,15]
- Alcohol costs the economy £20 billion annually including costs to the health service, criminal justice system and the economy, but 39% of a recent poll did not support the alcohol tax increases in the 2008 budget;[16] and
- Inappropriate advertising is tolerated, such as: alcohol logos on replica sports kits worn by children, the potential for billboards containing alcohol adverts to be placed outside schools,[17] and alcohol adverts during television programmes watched by children.[4]

However, not all alcohol-related behaviour is tolerated, especially regarding the behaviour of young people in town and city centres at night. Certain populations now avoid town centres at night, especially vulnerable groups such as women and older people.[10,18,19]

2. EVIDENCE OF HARM CAUSED BY DRINKING

For a range of public health issues, absolute levels of risk or harm are statistically evaluated in order to assess whether interventions are needed to protect the public.[20] Although there is no absolute consensus of what levels of risk are acceptable, where the chance of developing an illness is one in a million or less, often no action is taken because the risk is seen as acceptable.[21] Such an approach is used to assess whether carcinogens in food products or drinking water should be removed. However, individuals perceive risk differently and risk affects population groups in different ways (for example, older people are more at risk from infection).[21] Acceptability of risk also depends on whether the risk is imposed by another (such as through contamination, where risk is viewed as less acceptable) or through individual choice (such as tobacco or alcohol consumption, where risk is viewed as more acceptable).[7] So, while guidelines in Australia state that the consumption of two alcoholic drinks or

less in any one day for men and women would be low risk, they also explain that for those who drink at such levels, **the lifetime risk of alcohol-related mortality either from an injury or a disease is one in 100**.[22] Other sources also highlight the potential harm of alcohol:

- In Europe, alcohol is the third largest risk factor for disability and death causing over 60 diseases or traumas.[23]
- Alcohol and tobacco's chronic use causes up to 90% of all drug-related deaths in the UK.[9]
- In the UK acute alcohol-related anti-social behaviour contributes to over half of all accident and emergency visits.[8,24,25]

When UK experts evaluated the health and social impacts of 20 legal and illegal substances, alcohol was assessed as being the fifth most harmful (after drugs such as heroin and cocaine).[9] It was determined to be more harmful than drugs such as LSD, ecstasy and cannabis. The impact of alcohol is particularly widespread because it affects so many people and in so many ways (Table 2). The levels of harm are increasing in the UK: alcohol-related deaths doubled from 4,144 in 1991 to 8,758 in 2006.[26]

TABLE 2: EXAMPLES OF HARM CAUSED BY ALCOHOL[8,22-24,27]

	Short term harms	Long term harms
Physical and psychological	• Trauma (road and machine accidents, fire, drowning, falls, assaults, violence, child and elder abuse, suicide) • Sexual vulnerability and harm (regretted sex, assault, rape, pregnancy, sexually transmitted infections) • Ethanol toxicity (hospitalization, death) • Weight gain • Hangover, depression	• Alcohol dependence and abuse • Liver cirrhosis • Cancers (lip, oral, breast, pancreatic, hepatic, oesophageal, rectal) • Heart disease (hypertension, stroke dysrhythmias, cardiomyopathy) • Oesophagus (varices and haemorrhage) • Mental health and psychosis • Pellagra and malnutrition
Social	• Anti-social and criminal behaviour • Finances (debt, loss of earnings) • Social status (lost driving licence, remorse after road traffic accident, abuse or violence) • Education (truant, exclusion, fail exams) • Damage to friendships • Family problems (arguments, isolation)	• Economic (low productivity, income) • Low academic achievement • Lose home, belongings • Isolation (friends, family, work) • Unemployment, homelessness • Repeat cycle-poor parenting skills • Family problems (divorce, child custody • Family suffering (child development)

The risk of experiencing alcohol-related harm increases with consumption.[24] Analysis of over 150 high quality studies (involving more than 100,000 subjects) shows that:[25]

- Drinking three units per day (equivalent to one glass of wine and the female recommended maximum daily limit; Box 1) increases the risk of diseases such as liver cirrhosis and oral cancer.
- Drinking above three units per day raises the risk of conditions including hypertension and oral cancer.
- Drinking twelve units a day increases the health risks even further compared with non-drinkers, with the risk of liver cirrhosis increasing by 26 times. Further, a one litre per capita rise in annual consumption increases the number of liver cirrhosis deaths by 3.5% a year.[29]

BOX 1: SENSIBLE DRINKING GUIDELINES[30]

The Government's benchmark of sensible limits aims to moderate drinking (Table 3).[8] The limits were calculated for a middle-aged average weight and healthy person, and do not account for the impacts of age (both youth and older age), pregnancy, ill-health, or other factors such as obesity.

TABLE 3: DEFINITIONS OF LIMITS AND DRINKING CATEGORIES

Recommended maximum limits	Males	Females
Daily limit	3-4 units per day	2-3 units per day
Weekly limit	21 units per week	14 units per week

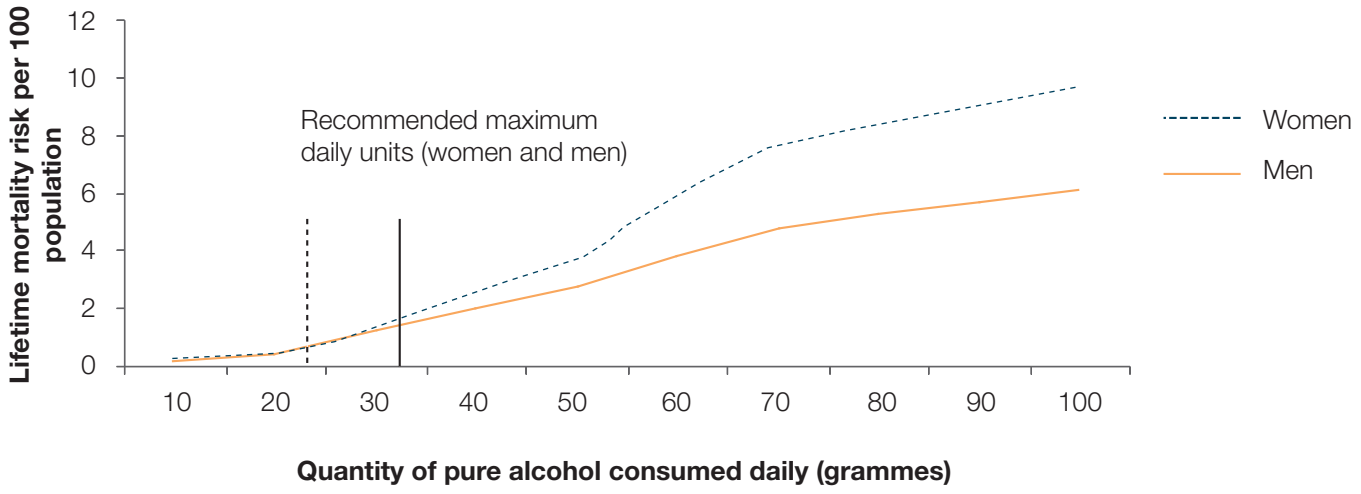
As well as showing the impact of alcohol consumption on heavier drinkers, recent analysis also highlights the impact on more moderate drinkers as even those who drink within Government guidelines (see Box 1) increase their risk of harm:

- Australian data suggest that alcohol consumption even within the UK sensible guidelines increases the risk of related mortality (Figure 1).[22] Women are particularly at risk.
- Consumption of any alcohol increases the risk of cancer.[31] The risk of breast cancer increases by 7% for each additional unit drunk on a daily basis.[32]
- Those consuming as little as two drinks a day are likely to develop Alzheimer's Disease 4.8 years earlier than those who drink less.[33]
- In Finland, two-thirds of self-reported problems, alcohol-related hospitalisations, deaths and premature life-years lost before 65 occur in the 90% of light to moderate drinkers compared with the 10% drinking to intoxication.[34]
- Underage Americans who drink at low levels have higher rates of criminal and delinquent activity compared with abstainers.[35]

Information on the potential positive impact of moderate consumption on health can be confusing,[5,24] and experts fear this provides an excuse to drink.[22,24] Some evidence has shown that moderate consumption such as one or two drinks a day may protect against ischemic heart disease (IHD),[36-38] but the evidence is limited:

- The positive affect is restricted to specific groups such as the middle-aged.[39,40]
- Some studies classified past drinkers as non-drinkers (they may have given up alcohol for health reasons and already experience health problems).[38] This means non-drinkers can have elevated levels of IHD, thus confusing the data.
- Any remaining protective effects are likely to be more than cancelled out because of the links with other conditions (such as cancer) where any consumption increases risk.[22,31,41,42]

FIGURE 1: LIFETIME RISK OF MORTALITY RELATED TO QUANTITY OF ALCOHOL INTAKE IN AUSTRALIA[22*]



* This does include the risk of mortality from violence, accidents or injuries.

2.1 POPULATION GROUPS VULNERABLE TO ALCOHOL HARM

The public perception is that young people are most at risk of alcohol related harm, since they are the group drinking most overtly and contributing to anti-social behaviour. Alcohol-related organ damage accrues over time so drinking behaviour in young people will impact on their subsequent adult health. However, every age group is affected, albeit in slightly different ways (Table 4).

3. INTERVENTIONS TO TACKLE ALCOHOL-RELATED HARM

3.1 INTERVENTIONS TO CHANGE PERCEPTION AND TOLERANCE

Disseminating information is the first step in influencing attitudes and behaviour.[43] This can occur in different ways, for example through school education, media liaison, advertising, and dedicated websites. However,

the process is not straightforward as individuals select what information they choose to receive and act on.[43,44] Thus, communications strategies must go beyond information provision if they are to build awareness and influence behaviour as shown by analyses of school education.[15,22,27,45,46] Further, evaluations can be difficult firstly because results could be due to other environmental factors, and secondly because changes may not always be immediate,[48] or sustained. Despite such issues, numerous social marketing campaigns both nationally and locally aim to influence perceptions and behaviour.[49,50] In part, these are necessary to counteract the glamourised image of alcohol.[8,15,24,51]

This positive image could be tackled further through the use of better role models and saturating communities with health information, although evidence of effectiveness of this approach remains limited.[40,45,46,52] In addition mass media health promotion campaigns, aiming to counter alcohol industry marketing, may be less effective because their budgets are so much smaller.[46,52] At best they raise awareness and build public support for related policies.[53] Limiting or even banning adverts would be more effective. Modelled data in America predicted that a complete ban on alcohol advertising would reduce alcohol-related years of life lost by 16.4%.[54]

TABLE 4: HARM EXPERIENCED BY A SELECTION OF POPULATION GROUPS

Population	Potential harm experienced
Under 18s	• Alcohol stimulates brain opioids and the release of dopamine (inducing pleasure, masking pain and causing mood swings).[24,55] Intoxication, particularly binge drinking, harms brain development and increases alcohol dependency (see Fact Sheet 2) .[56] • Alcohol can increase the vulnerability in already vulnerable groups: 15-17 year olds are twice as likely to have experienced alcohol-related harm (such as suicides, self-harm, violence, sexual assault, car accidents) compared with older adults (40-44 years).[22] Risk increases for even younger teenagers, with 12-14 year olds being four to five times more likely to have experienced such harm. • Risky behaviour and ensuing harm increases with the frequency of binge drinking.[57,58] • Binge drinking combined with depression amongst young people is a predictor of suicidal ideation, self-harm and suicide.[59] • Consumption of one to two drinks on any occasion can put young people at higher risk of harm than abstainers, indicating that just by participating they risk harm.[58]
Young adults	• Cultural norms encourage drinking and high risk behaviour, exemplified by the drinking of shots.[15] • A relatively high income with less responsibility makes consumption more accessible.[15] • There was a seven-fold increase in liver cirrhosis mortality in 25-34 year olds between 1979 and 2005,[60] in part because the trend for binge drinking increases risk.[15,24] • This age group can still have under-developed decision making skills.[61] Alcohol's effect on the brain thus encourages risky behaviour including unsafe sex, sexual coercion, illicit drug use, and is related to injuries and violence.[27,62]
Middle aged adults	• There was a six-fold increase in liver cirrhosis mortality in 45-54 year olds between 1979 and 2005.[60] • Until the 1990s, alcoholic liver disease hospital admissions were highest in 55-64 year olds, but diagnosis is now more common in younger groups, with numbers doubling for both 35-44 and 45-54 year olds between 1989/90 and 2002/03.[60] Males continue to be at greater risk but the increased incidence for 45-54 year old females is particularly acute. • Drinking small amounts may protect against heart disease (IHD) in this age group, but this is offset by evidence that such drinking causes long-term organ damage and cancer.[22,31]
The elderly	• Alcohol is associated with: increased risk of developing chronic conditions such as stroke or cancer;[63-65] increased risk of accidental injuries and falls;[66,67] reduced cognitive and intellectual functioning such as memory loss; dementia; increased risk of depression and suicide; and self neglect.[71] • Changes in body composition due to age make older people less tolerant to alcohol. Thus over time, equivalent drinking levels result in higher blood alcohol concentrations and greater negative effects.[72] • Triggers of alcohol use such as bereavement, physical ill health, mental stress, loneliness or isolation, and loss of occupation or income are more commonplace in this group and so may make them more likely to drink in order to cope.[73] • Alcohol consumption can adversely affect illness progression and ability to take medication.[74] • Drinking alcohol whilst taking prescribed drugs can increase the risk of adverse health effects and reduce the effects of medication.[75]
Pregnant and nursing women	• Alcohol can damage an unborn child:[22] excessive drinking leads to stillbirth, miscarriage, foetal growth retardation, mental retardation, birth defects, and foetal alcohol syndrome.[22,23] • Exposure to alcohol *in utero* triples the risk of aggression and delinquency,[76] and lowers intelligence in later childhood.[77] • The risk of alcohol problems triples for 13-17 year olds if their mother consumed three to four drinks a few times in early pregnancy.[78] • Alcohol enters the breast milk and affects breastfeeding, infant development and behaviour.[22]

Social marketing campaigns have aimed to generate knowledge and stimulate use of alcohol units to monitor intake.[50] In some instances, alcohol units are displayed on beverages to help this (labels containing unit information will become mandatory in 2008; see Fact Sheet 7).[8] However, labels may increase awareness but will not necessarily change behaviour.[45,46] Thus, while 85% of the UK public have heard of units, only 12% of those check their daily or weekly unit intake.[79] Increased flexibility of purchasing hours for alcohol (through the Licensing Act 2003) are hoped in the long-term to encourage self-regulation through a shift towards a more Mediterranean moderate drinking culture, but so far evidence on the Act's impact is mixed (see Fact Sheet 6).[80] Normative education or social influence programmes, particularly in schools and universities, have also been used to try to tackle perceptions. However, evidence on their effectiveness is inconsistent and insufficient, especially regarding long-term effects.[27] Thus, interventions that are more effective at reducing consumption and harm should be prioritised.[27,40,45,46,52]

3.2 INTERVENTIONS WHICH REDUCE ALCOHOL CONSUMPTION AND HARM

The Government Strategy aims to change public perception and tolerance of drunkenness and drinking which cause harm by reducing high levels of alcohol consumption.[8] A diverse array of alcohol control strategies and other initiatives aim to achieve this.[22,24,40,45,46] These are described in this series of Fact Sheets:

- Fact Sheet 2: Alcohol availability to underage drinkers.
- Fact Sheet 3: Cheaply available alcohol, irresponsible promotions and deap discounting.
- Fact Sheet 4: Restricted drinking in public places.
- Fact Sheet 5: Strengthened action on drink-driving.
- Fact Sheet 6: Licensing hours and density.
- Fact Sheet 7: Reducing alcohol content in drinks.

Examples of effective interventions include: sustained increase in price of alcohol; amendments to drink-driving legislation (allowing random breath tests and reducing the drink-drive limits); providing training for bar staff (with legal liability); motivational and brief advice; community mobilisation interventions; restrictions on availability (for example preventing underage sales); restricting alcohol licences; and restricting density of alcohol outlets.

3. SUMMARY

Alcohol exerts both acute and chronic harm on the population yet perceptions of own drinking are based on underestimates of own intake, lack of knowledge of harms and inflated belief of benefits. Perceptions of related harm are based on the extreme behaviours of others and can lead to people avoiding town centres at night. The public define moderate (sensible) drinking as not getting overtly drunk, leading to a higher maximum consumption level than advised. At the same time, evidence suggests increasing consumption is causing higher rates of mortality from alcohol-related organ damage and cancers, including in younger age groups. Confused perceptions of alcohol harm and overt industry marketing to maintain sales complicate the delivery of effective alcohol messages, limiting the effectiveness of education and the media. Highly effective interventions to reduce harm are reported in accompanying Fact Sheets and include lowering the drink-drive limit, price increases and restricted outlet density.

REFERENCES

1 Sproston K, Primatesta P (2004). Health Survey for England volume 2: risk factors for cardiovascular disease. The Stationery Office, London.

2 Goddard E (2006). Smoking and drinking among adults, 2005. Office for National Statistics, London.

3 HM Revenue and Customs (2007). Alcohol fact sheet. HMRC, London.

4 Alcohol Concern (2007). Not in front of the children: child protection and advertising. July 2007, Alcohol Concern, London.

5 Green C, Polen M, Janoff S et al. (2007). "Not getting tanked": definitions of moderate drinking and their health implications. Drug Alcohol Depend. 86(2-3):265-73.

6 Mukamal KJ, Phillips RS, Mittleman MA (2008). Beliefs, motivations, and opinions about moderate drinking: a cross-sectional survey. Fam Med. 40(3):188-95.

7 Slovic P, Fischhoff B, Lichtenstein S (1979). Rating the risks. Environment. 21(3):14-20. Cited in Hunter PR, Fewtrell, L (2001). Acceptable risk. In Fewtrell L, Bartram J (eds). World Health Organization. Water quality: guidelines, standards and health. IWA Publishing, London.

8 Department of Health, Home Office, Department for Education and Skills et al. (2007). Safe, social, sensible: the next steps in the National Alcohol Strategy. Prime Minsters Strategy Unit, London.

9 Nutt D, King LA, Saulsbury W et al. (2007). Development of a rational scale to assess the harm of drugs of potential misuse. Lancet. 369:1047-53.

10 Watts B (2008). What are today's social evils? Joseph Rowntree Foundation, London.

11 Donaldson L (2001). On the state of the public health: the annual report of the Chief Medical Officer of the Department of Health 2001. Department of Health, London.

12 Upton A (2007). Perceptions and experience of antisocial behaviour: findings from 2004/05 British Crime Survey. Home Office Report 21/06. Home Office, London.

[13] Nicolas S, Kershaw C, Walker A (2007). Crime in England and Wales 2006/07. Home Office, London.

[14] Fuller E (ed) (2007). Drug use, smoking and drinking among young people in England in 2006. National Centre for Social Research and the National Foundation for Educational Research, London.

[15] Measham F, Brain K (2005). Binge drinking, British alcohol policy and the new culture of intoxication. Crime Media Culture. 1:262-83.

[16] Populus (2008). The Times post budget poll. CATI fieldwork: March 12th-13th 2008. Populus, London.

[17] Lightowlers C, Morleo M, Harkins C et al. (2007). Developing safer night time environments through effective implementation of planning. Centre for Public Health, Liverpool John Moores University.

[18] Brammar J (2006). Fear of crime and the impact of crime: a consultative report of older people living in Stoke on Trent. Engaging for Health Project. Beth Johnson Foundation, Stoke on Trent.

[19] Wilkins H (2003). The 24 hour city – implications for women's safety. A paper presented to the London Women and Planning Forum.

[20] Royal Commission on Environmental Pollution (1998). Setting environmental standards: Royal Commission on Environmental Pollution. 21st report. The Stationery Office, London.

[21] Hunter PR, Fewtrell, L (2001). Acceptable risk. In Fewtrell L, Bartram J (eds). World Health Organization. Water quality: guidelines, standards and health. IWA Publishing, London.

[22] National Health and Medical Research Council (2007). Australian alcohol guidelines for low-risk drinking. NHMRC.

[23] World Health Organization (2004). Public health problems caused by alcohol. EB115/37. WHO, Geneva.

[24] British Medical Association (2008). Alcohol misuse: tackling the UK epidemic. BMA Board of Science, London.

[25] Sivarajasingham V, Matthews K, Shepherd J (2006). Price of beer and violence-related injury in England and Wales. Injury. 37(5):388-94.

[26] Office for National Statistics (2008). Alcohol related death rates continue to rise. Press release, 25 January 2008. Office of National Statistics, London.

[27] Jones L, James M, Jefferson T et al. (2007). A review of the effectiveness and cost-effectiveness of interventions delivered in primary and secondary schools to prevent and/or reduce alcohol use by young people under 18 years old. National Institute of Clinical and Health Excellence, London.

[28] Corrao G, Bagnardi V, Zambon A et al. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases. Prev Med. 38(5):613-9.

[29] Ramstedt M (2007). Population drinking and liver cirrhosis mortality: is there a link in Eastern Europe? Addiction. 102(8):1212-23.

[30] Department of Health (1995). Sensible drinking - the report of an inter-departmental working group. The Stationery Office, London.

[31] World Cancer Research Fund and American Institute for Cancer Research (2007). Food, nutrition, physical activity, and the prevention of cancer: a global perspective. AICR, Washington, DC.

[32] Beral V (Secretariat) and Collaborative Group on Hormonal Factors in Breast Cancer. (2002). Alcohol, tobacco and breast cancer--collaborative reanalysis of individual data from 53 epidemiological studies (truncated). Br J Cancer. 18;87(11):1234-45.

[33] American Academy of Neurology (2008). Alzheimer's starts earlier for heavy drinkers, smokers. Press release, 16 April 2008. American Academy of Neurology, Chicago.

[34] Poikolainen K, Paljärvi T, Mäkelä P (2007). Alcohol and the preventive paradox: serious harms and drinking patterns. Addiction. 102(4):571-8.

[35] French M, MacLean J (2006). Underage alcohol use, delinquency, and criminal activity. Health Econ. 15(12):1261-81.

[36] Doll R, Peto R, Hall E, et al. (1994). Mortality in relation to consumption of alcohol: 13 years' observations on male British doctors. BMJ. 309(6959):911-8.

[37] English D, Holman C, Milne E et al. (1995). The quantification of drug caused morbidity and mortality in Australia. Commonwealth Department of Human Services and Health, Canberra.

[38] Fillimore K, Kerr W, Stockwell T et al. (2006). Moderate alcohol use and reduced mortality risk systematic error in prospective studies. Addict Res Theory 14: 101-32.

[39] King D, Mainous A, Geesey M (2008). Adopting moderate alcohol consumption in middle age: subsequent cardiovascular events. Am J Med. 121(3):201-6.

[40] World Health Organization (2007). WHO expert committee on problems relating to alcohol consumption. Second report. WHO, Geneva.

[41] Lau K, Freyer-Adam J, Coder B, et al. (2008). Dose-response relation between volume of drinking and alcohol-related diseases in male general hospital inpatients. Alcohol Alcohol. 43(1):34-8.

[42] White I, Altmann D, Nanchahal K (2004). Mortality in England and Wales attributable to any drinking, drinking above sensible limits and drinking above lowest-risk level. Addiction. 99(6):749-56.

[43] Windahl S, Siquitzer B, and Olsan JT (1992). Using communications theory: an introduction to planned communication. Sage Publications, London.

[44] Shimp TA (1997). Advertising, promotion and supplemental aspects of integrated marketing. The Dryden Press, Harcourt Brace College Publishers, Inc.

[45] Anderson P, Baumberg B (2006). Alcohol in Europe: a public health perspective. Institute of Alcohol Studies. London.

[46] Babor T, Caetano R, Casswell S et al. (2003). Alcohol: no ordinary commodity. Research and public policy. Oxford University Press.

[47] Johnson, M. (2005). Proving its worth. PR Week. 4 February 2005.

[48] Childers Hon, L. and Grunig, J.E. (1999). Guidelines for measuring relations in Public Relations. Institute for Public Relations. Gainsville, Florida.

[49] Association of Chief Police Officers (2008). Young drivers warned as drink driving campaign comes to an end. Quarter 1. Press Release 17 January 2008. ACPO.

[50] Morleo M, Harkins C, Lushey et al. (2007). Investigating drinking behaviours and alcohol knowledge amongst people resident in the Linacre and Derby wards of Sefton: interim report. Centre for Public Health, Liverpool John Moores University.

[51] Measham F (2006). The new policy mix: alcohol, harm minimisation, and determined drunkenness in contemporary society. Intern J Drug Policy 17: 257-68.

[52] Giesbrecht N (2007). Reducing alcohol-related damage in populations: rethinking the roles of education and persuasion interventions. Addiction. 102: 1345-49.

[53] Casswell S, Gilmore L, Maguire V et al. (1989). Changes in public support for alcohol policies following a community-based campaign. Br J Addict. 84(5):515-22.

[54] Hollingworth W, Ebel BE, McCarty CA et al. (2006). Prevention of deaths from harmful drinking in the United States: the potential effects of tax increases and advertising bans on young drinkers. J Stud Alcohol. 67(2): 300-8.

[55] Barr C, Schwandt M, Lindell S (2007). Association of a functional polymorphism in the μ-opioid receptor gene with alcohol response and consumption in male rhesus macaques. Arch Gen Psych. 64(3):369-76.

[56] Crews F, He J, Hodge C (2007). Adolescent cortical development: a critical period of vulnerability for addiction. Pharmacol Biochem Behav. 86(2):189-99.

[57] Hughes S, Bellis MA, Hughes K et al. (2008). Predictors of risky drinking in North West school children and alcohol-related negative outcomes. Centre for Public Health, Liverpool John Moores University.

[58] Miller J, Naimi T, Brewer R et al. (2007). Binge drinking and associated health risk behaviours among high school students. Paediatr. 119:76-85.

[59] Swahn M, Bossart R (2007). Gender, early alcohol use and suicide ideation and attempts: finding from the 2005 Youth Risk Factor Behaviour Survey. J Adolesc Health 41:175-81.

[60] Thomson SJ, Westlake S, Rahman TM et al. (2008). Chronic liver disease – an increasing problem: a study of hospital admission and mortality rates in England, 1979-2005 with particular reference to alcoholic liver disease. Alcohol Alcohol. 0(0):1-7.

[61] Giedd JN (2008). The teen brain: insights from neuroimaging. J Adolesc Health. 42(4):335-43.

[62] Hughes K, Anderson Z, Morleo M et al. (2007). Alcohol, nightlife and violence: the relative contributions of drinking before and during nights out to negative health and criminal justice outcomes. Addiction. 103:60-5.

[63] Bagnardi, V (2001). Alcohol consumption and the risk of cancer: a meta-analysis. Alcohol Research and Health. 25(4):263-70.

[64] Mukamal KJ, Chung H, Jenny NS et al. (2005). Alcohol use and risk of ischaemic stroke among older adults: the cardiovascular health study. Stroke. 36(9):1830-4.

[65] Reynolds K, Lewis L, Nolen J et al. (2003). Alcohol consumption and risk of stroke: a meta analysis. JAMA. 289: 579-88.

[66] Fletcher PC, Hirdes JP. (2005). Risk factor for accidental injuries within senior citizens' homes: analysis of the Canadian Survey on Ageing and Independence. J Gerontol Nurs. 31(2):49-57.

[67] Mukamal KJ, Mittleman MA, Longstreth WT Jr et al. (2004). Self-reported alcohol consumption and falls in older adults: cross-sectional and longitudinal analyses of the cardiovascular health study. J Am Geri Soc. 52(7):1174-9.

[68] Edelstein SL, Kritz-Silverstein D, Barrett-Connor E (1998). Prospective association of smoking and alcohol use with cognitive function in an elderly cohort. J Women's Health. 7(10):1271-81.

[69] Thomas VS, Rockwood KJ (2001). Alcohol abuse, cognitive impairment, and mortality among older people. J Am Geri Soc 49:415–420.

[70] Blow FC, Brockmann LM, Barry KL (2004). Role of alcohol in late-life suicide. Alcohol Clin Exp Res. 28(5 Suppl):48S=56S.

[71] Blondell RD (1999). Alcohol abuse and self neglect in the elderly. J Elder Abuse Negl. 11(2).

[72] Reid MC, Anderson PA (1997). Geriatric substance use disorders. Med Clin North Am. 81: 999-1016.

[73] Alcohol Concern (2002). Older people and alcohol misuse. Alcohol Concern, London.

[74] Weiss RD (2004). Adherence to pharmacology in patients with alcohol and opioid dependence. Addiction. 99(11): 1382-92.

[75] Stevenson JS (2005). Alcohol use, misuse, abuse and dependence in later adulthood. Ann Rev Nurs Res. 23: 245-80.

[76] Sood B, Delaney-Black V, Covington C, et al. (2001). Prenatal alcohol exposure and childhood behavior at age 6 to 7 years: I. dose-response effect. Pediatr. 108(2):E34.

[77] Bailey BN, Delaney-Black V, Covington CY, et al. (2004). Prenatal exposure to binge drinking and cognitive and behavioral outcomes at age 7 years. Am J Obstet Gynecol. 191(3):1037-43.

[78] Alanti R, Mamun A Al, Williams et al. (2006). In utero alcohol exposure and predictors of alcohol disorders in early adulthood: a birth cohort study. Arch Gen Psych 63: 1009-16.

[79] Office for National Statistics (2008). Drinking: adults' behaviour and knowledge in 2007. ONS Omnibus Survey Report, No 34, January 2008

[80] Morleo M, Harkins C, Hughes K et al. (2007). The implementation and impact of the Licensing Act 2003 in Lancashire. Centre for Public Health, Liverpool John Moores University.

ACKNOWLEDGEMENTS:

We would like to thank all those who contributed to the production of this fact sheet, including Brenda Fullard from the Department of Health, and all those at the Centre for Public Health at Liverpool John Moores University, in particular Gillian Elliott, Kerin Hannon, Corinne Harkins, Carly Lightowlers and Lee Tisdall.

Contact:

Michela Morleo

Centre for Public Health

Faculty of Health and Applied Social Sciences

Castle House

North Street

L3 2AY

m.j.morleo@ljmu.ac.uk

0151 231 4535

ISBN: 978-1-906591-29-8 (print)

ISBN: 978-1-906591-30-4 (web)

liverpool JMU Centre for Public Health

Government Office for the North West