

centre lines

A bi-monthly newsletter published alternately by the National Drug Research Institute (NDRI), Perth and the National Drug and Alcohol Research Centre (NDARC), Sydney

NDRI (28)

August 2009

issuing **forth**

Alcohol use during pregnancy:
directions for Australian policy



Funded by the
National Drug Strategy

Registered by Australia Post –
Print Post Publication No
PP236697/00013
ISSN 1034-7259

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edspace

Welcome to the August issue of *CentreLines*, which focuses on alcohol use and pregnancy. In *Headspace*, Professor Steve Allsop considers the implications of gaps in our current knowledge and understanding in this challenging area. This is followed by *Issuing Forth* in which Senior Research Fellow Nyanda McBride discusses the consequences of alcohol consumption during pregnancy and examines possible future directions for prevention and policy.

Project Notes includes information about an ongoing Cochrane systematic review which aims to examine and ascertain the effectiveness of many commonly used alcohol and drug interventions in the workplace. Also in *Project Notes* is information about a new NHMRC-funded program aimed at building Australia-wide capacity in Indigenous offender health and health care delivery; and finally a report on the THRIVE program, a highly practical online alcohol intervention for university students.

As previously advised, NDRI is endeavouring to move away from the distribution of printed copy towards predominantly electronic circulation of *CentreLines*. If you have not yet provided NDRI with your email address we encourage you to do so as soon as possible. For further information, please see the back page of this issue.

For more information about NDRI's research and other activities, please visit ndri.curtin.edu.au.

Rachael Lobo
Editor

NDRI
national drug research institute

Alcohol and pregnancy: filling the knowledge gaps

Many countries, including Australia, have developed guidelines and recommendations on alcohol use and pregnancy because of concerns surrounding alcohol consumption during pregnancy. Although the research at present does not allow the establishment of a clear threshold at which prenatal exposure to alcohol results in harm, there is consensus that alcohol can affect fetal development, potentially having a deleterious impact on cognitive development and functioning, retarding fetal growth, and leading to later adverse outcomes in terms of social and emotional functioning and cognitive and motor performance. Nyanda McBride summarises these diverse adverse impacts and it is important to note that, whilst there is no clear threshold for risk, it is evident that risk is related to patterns of consumption and to particular periods of fetal development. However, there is contention about the relevance of particular patterns and particular amounts of drinking. Combining what we do know with what is still unclear led to the following information being included in the latest NHMRC alcohol guidelines:

- the risk is higher with high alcohol intake, including episodic intoxication;
- the risk appears to be low with low level intake;
- it is impossible to determine how maternal and fetal factors will alter risk in the individual. (NHMRC, 2009, p77)

Despite the debate about specific thresholds for risk, the evidence is compelling enough to

have resulted in the World Health Organization identifying Fetal Alcohol Syndrome (FAS) as the leading cause of environment-related birth defects and mental retardation in the western world. While the extent of FAS and Fetal Alcohol Spectrum Disorder (FASD) in Australia has not been accurately established, there is increasing concern that, as well as having relevance for the broad population, some groups and communities are at particular risk because of a range of factors including higher rates of hazardous drinking.

As we see increases in risky alcohol consumption among some groups, including among women of childbearing age (eg the Australian Longitudinal Study on Women's Health indicated that among 18-23 year old women, 18 percent drank five or more drinks on a single occasion at least once per week and 21 percent did so about once per month (Clemens et al, 2007)), it is of concern that we know so little about FAS and FASD. Poor understanding of the criteria for diagnosis, limited health practitioner expertise, and possible reluctance to make a diagnosis that may carry some stigma for the child and the family all contribute to possible underdiagnosis.

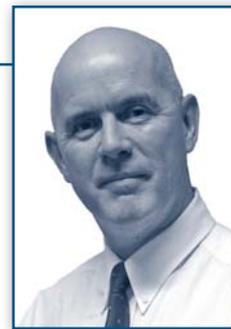
Compounding these limitations of diagnosis and evidence of prevalence there is a lack of evidence about effective interventions. For example, the US Institute of Medicine proposed a combined approach of universal, selective and targeted prevention strategies. Kyskan and Moore (2005) recommended that approaches should include the following:

- Assess community knowledge about FAS;
- Educate health professionals;
- Ensure public health strategies to broadly target hazardous drinking across the community (eg price controls);
- Ensure warning labels on alcohol containers;
- Develop social marketing strategies to reduce hazardous drinking especially during pregnancy.

The problem is that there is a dearth of evidence about effective strategies, either alone or in combination. It is important that we advance community understanding of what we know about the risks of alcohol use during pregnancy, and the limitations of our knowledge, to ensure more informed decision making. We should also be attending to the implications of the work of our colleagues Roslyn Giglia and Colin Binns on alcohol use and breastfeeding.

The gaps in our knowledge base indicate that as we await the release of further outputs of the Intergovernmental Committee on Drugs FASD working party, one priority we should hope for is a commitment to invest in developing a stronger evidence base to guide effective responses. **cl**

Steve Allsop
Director



issuing **forth**

Alcohol use during pregnancy: directions for Australian policy

The association between alcohol use during pregnancy and infant health was first reported in a scientific publication in 1899 by Dr William Sullivan¹ who proposed that the stillbirths of alcoholic prisoners in a Liverpool prison were caused by alcohol. Subsequent observations were reported around 70 years later in France², the United States of America (US)^{3,4}, Germany⁵ and Sweden⁶. These researchers noted that the distinctive characteristics of children of alcoholic mothers were similar between children without genetic connection, suggesting damage during the prenatal period. The term Fetal Alcohol Syndrome (FAS) was

recommended by dysmorphologists Jones and Smith⁴ to identify the causal agent and to encourage prevention⁷.

FAS is characterised by structural brain abnormalities and deficits in growth and neurological development resulting in a range of life-long disabilities. Fetal Alcohol Spectrum Disorder (FASD) includes FAS but also represents a range of less severe outcomes generally associated with lower level (ie not binge) use of alcohol during pregnancy. FAS is the only FASD condition defined by International Statistical Classification of Diseases and Related Health Problems:

ICD-9 and diagnostic criteria for FAS include confirmed history of maternal alcohol exposure, evidence of facial dysmorphism, growth retardation and central nervous system dysfunction⁸. However, it is of note that magnetic resonance brain imaging indicates that neurological deficits can occur in isolation to facial abnormalities⁹. What this means for individuals with FASD is a reduced ability to



function on a day to day basis, increased physical and mental health concerns leading to disrupted schooling and employment, reduced ability to live independently, increased risk of involvement with the law, and a higher level of substance abuse, unintended pregnancy, sexually transmitted disease and injury, to mention a few^{10,11,12,13,14}. Although the outcomes of FASD often present as behavioural problems, these are secondary disabilities. FASD has its primary origins in damage to the developing central nervous system and this functional damage is irreversible.

Determining prevalence of FAS

The World Health Organisation recognises, and has done for over 10 years, that alcohol use during pregnancy which results in FAS is the leading cause of environmental-related birth defects and mental retardation in the Western World¹⁵. Current prevalence rates of FAS differ depending on the methodology used to identify cases¹⁶. Active systems tend to be most accurate as they rely on diagnostic criteria of children aged 3 to 12 years when characteristics are most pronounced and when behavioural and learning deficits can be more accurately diagnosed¹⁶.

In the US, current prevalence rates of FAS, using various diagnostic reporting methodologies, range from 0.2-1.5 cases per 1000 live births¹⁰. The US has well developed reporting mechanisms for FAS, and well disseminated intervention programs to reduce alcohol use during pregnancy. In Australia, where this is not so^{11,17}, recent estimates suggest a prevalence rate of 0.06 per 1000 live births (under 15 years) and an Indigenous rate of 8.11 per 1000¹⁸. The US has a higher recorded prevalence rate of FAS than Australia. However Australia has a higher rate of drinking among women of childbearing age and pregnant women than the US^{19,20} with the most recent studies reporting that approximately 50 percent of Australian women continue to drink while pregnant^{21,22}. Clearly our reporting and recording systems are letting us down¹¹. Consequently there is a need to develop effective reporting, using active systems, to clarify FAS prevalence rates in a variety of populations within Australia, and to develop effective diagnostic criteria for other FASD conditions.

Of particular concern in Australia are recent anecdotal reports suggesting that some populations have a recurring history of FAS exposure, with at least two generations of members born with and giving birth to FAS affected children^{23,24}. Why then has Australia failed to accurately and adequately diagnose, record, treat and prevent such a critical and preventable public health issue for several decades? Part of the reason may be that infants and children impacted upon by fetal alcohol effects are diagnosed under other disabilities and receive services under these

alternative classifications. In Western Australia, for example, there is a particularly high recorded prevalence of Attention Deficit and Hyperactivity Disorder (ADHD)^{25,26} shared to a lesser extent with other states of Australia²⁵. Research reports that hyperactivity and attention deficit are noted in 61 percent of FAS cases¹⁶, suggesting that alternative classifications are possible and probable. The aetiologies of disabilities, however, are important as they can determine treatment protocols and can have an important impact on policy, funding, and the focus of prevention activity.

Policy and prevention

A review of international alcohol policies indicates that several countries including Australia have updated policies that relate to pregnant women and alcohol within the last two years^{27,28,29}. There is, however, a divergence of policy advice, with some countries stating that pregnant women should not drink and other countries stating that not drinking is the safest option but that one or two drinks per week is considered low risk. The new Australian guidelines for pregnant (and breastfeeding) women adopt the more lenient second option²⁹. This dichotomy of policy shows divergence in interpretation of the current available research on low level use of alcohol during pregnancy. However, it is of note that pregnant women in Australia are approximately four times more likely to drink than pregnant women in the US^{21,30}. Australia's prevention aims should consider this difference as it demonstrates that a country with an exclusive abstinence policy approach to alcohol consumption during pregnancy can achieve a relatively lower rate of consumption (12 percent) than one without (50 percent)³⁰.

If Australia is to develop effective FASD prevention activity, we need ongoing up-to-date reporting systems to keep tabs on consumption rates of pregnant women as well as the prevalence of FAS and, as diagnostic criteria become better defined, of other FASD conditions. As with any well designed prevention planning, findings from evidence based reviews of the research literature, particularly from countries more advanced in dealing with the issue, should be incorporated. Having said that, there is a dearth of evidence about what works in terms of preventing and responding to FASD. Recent reviews of random control/clinical trials suggest the importance of individual brief interventions in clinical settings³¹. However, there is limited information on the impact of larger scale community interventions suggesting the need for more intervention research. We know that a proportion of women cease consumption once pregnancy is recognised, and participatory research with these women could prove beneficial to the development of intervention programs, as would participatory research with women who continue to drink.

Conversely, some prenatal consumption occurs in the non-recognised part of pregnancy and this introduces the need for intervention and policy focused on women of child-bearing age. Another consideration that may impact on prevention planning will require further research to clarify its impact within the Australian context. A recent Canadian report notes that a higher proportion of the population is affected by less severe FASD outcomes than those affected by FAS³², and this replicates the findings of a German study³³ which notes that the number of severe cases of FAS decreased between 1973 and 1999 but the number of mild cases increased. This introduces the issue of the prevention paradox, where more harm can be prevented by targeting a larger although lower consuming proportion of the population³⁴. If this pattern also proves to be in play in Australia then it has implications for policy recommendations and intervention/prevention funding.

Part of the answer in developing effective prevention policy and activity is adequate funding, and one funding option may lie in the redistribution of alcohol taxes to develop and support prevention of alcohol exposed pregnancies. This approach has worked well with tobacco through organisations such as the Western Australian Health Promotion Foundation where tobacco taxes are redistributed to research and practice. If an organisation was to exist for the redistribution of alcohol taxes to prevent alcohol exposed pregnancies, then prevention activity should include women who are considering pregnancy (preconception), who are currently pregnant, and who are breastfeeding. In addition prevention should also focus on women of child-bearing age as research reports that preconception drinking rates are reflected in pregnancy³⁵, and that consumption 10 years earlier can predict pregnancy consumption³⁶. This research, linked with the recent increase in the number of young Australian women drinking, and the amount of alcohol consumed by young women²¹, reinforces the need to focus some of the prevention efforts on women of child-bearing age. A second funding alternative, albeit less popular among certain groups, is the reimbursement of health costs from industry groups, particularly those groups that have focused product development and advertising at women and specifically women of child-bearing age.

The soon to be released Intergovernmental Committee on Drugs (IGCD) report dealing with alcohol use during pregnancy and FASD will be an important starting point for action in Australia. Early drafts of the report suggest that the IGCD will provide long needed recommendations on measuring and recording FASD, a major focus on prevention, and the development of treatment guidelines³⁷. This report can potentially form the basis of a

comprehensive and well considered approach to alcohol use during pregnancy and FASD that takes us beyond our current grassroots level.

Other considerations

Another concern that does need consideration in the whole public health issue of alcohol use during pregnancy is that of maternal guilt, fear and stigma. O'Leary³⁸ comments that this issue relates to concerns of possible terminations by women who have drunk alcohol during early pregnancy at a time when the pregnancy was unrecognised. However, there is also the historical guilt of mothers who have at sometime in the past had an alcohol exposed pregnancy, whether inside or outside past policy guidelines, with subsequent impact on their child, and the possible stigmatization of mothers particularly as the name of the syndrome is directly related to the prenatal actions of the mother. Additionally, campaigns that raise awareness of risks of alcohol consumption during pregnancy need to consider the creation of unnecessary anxiety or the 'worried well', particularly given the current dearth of information about low level use during pregnancy. There is a clear need for more research around these issues so that they can be better incorporated within interventions aiming to reduce the social, family and medical costs associated with prenatal alcohol use.

From a community perspective the fiscal costs associated with dealing with FAS in the US are US\$2.9 million per case per lifetime or an annual cost of US\$3.6 billion (mean adjusted costs), making FAS one of the most expensive birth defects for the community to treat^{10,39}. If we apply the well-developed US surveillance and diagnostic process to the Australian situation we find that a more likely prevalence rate in the general population for Australia would be somewhere between 0.85 to 6.25 per 1000 live births (US 0.2-1.5 per 1000 prevalence rate applied to Australian 50 percent alcohol use during pregnancy). In 2007 there were 285,213 births in Australia⁴⁰ suggesting that between 242 and 1781 children were born with FAS that year with an approximate lifetime cohort cost of between AU\$878-AU\$6457 million (when AU\$0.80 equals US\$1). Although only rough estimates, these figures suggest the possible cost benefits of prevention, and that calculating accurate economic costs for Australia is an essential part of any future focus on FASD.

The impact of maternal guilt and creating worried-well versus community impact and costs are aspects that need to be debated in a forum greater than this. However all of these issues reinforce the necessity of intervention that reaches women of child-bearing age and

those in the preconception stage, in addition to pregnant women. Given the impact on future generations and for the protection of future individuals and families, these discussions should not delay action on dealing in some way with future alcohol exposed pregnancies while this issue is debated.

With some exceptions, the history of Australian women's alcohol use and therefore the potential for alcohol exposed pregnancies is relatively recent, starting around the late 1960's and increasing to current times. This 40-to-50 year period of potential and probable alcohol-affected pregnancies will have resulted in an increasing prevalence of FASD, leading to current rates where one in every two births have some level of alcohol exposure and therefore some risk of FASD. FASD represents a loss of potential for individual and community health involving individual, family, social, community and financial costs. FASD is preventable, so this period of probable effect represents a 40-to-50 year period of lost opportunity for public health action to reduce the impact of alcohol use during pregnancy. Australian women are still drinking, often to high risk levels during pregnancy. To move forward and reduce any future impact requires a high level of multidisciplinary collaboration between governments, health professionals, researchers and affected families and communities, and requires action at multiple levels. Australia has a proven capacity to lead the world in public health issues and, as surprising as it is that we lag so far behind on this issue, it is rectifiable. **cl**

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project notes

Cochrane review of workplace interventions for alcohol and other drug problems

Rina Cercarelli, Steve Allsop, Richard Midford, Ken Pidd (NCETA)

Alcohol and other drugs can have a significant impact on workplaces. They can result in a loss of productivity from absenteeism, poor decision making and increased morbidity. Specific productivity problems include procrastination, inconsistent performance, neglect of detail, poorer quality of work, less quantity of work and more mistakes. Alcohol and other drugs can also threaten the safety measures of a work environment by impairing coordination, slowing reaction times, increasing poor judgement and distorting perceptions of hazardous work. There is considerable evidence linking alcohol, and to a lesser extent other drug use, with transportation accidents and injuries. Alcohol and other drug use can also produce economic burden in the form of compensations and employer liabilities.

A number of risk factors for workplace and other drug problems have been identified, including gender, age, low education levels, low self esteem, long working hours, high physical work demands, monotonous work, job insecurity and poor supervision.

What is unclear is the nature of drug-related harm in the workplace. Data on this are extremely limited due to the reluctance of both employers and employees to provide information relating to employee drug use. It has been suggested that some claims about the level of harm in particular industries are exaggerated and without foundation. Even when good evidence does exist, it is often allied to specific industries or occupations, limiting the ability to generalise to a broad range of workplaces. This creates a critical flaw in our abilities to estimate alcohol and other drug harm in the workplace. In addition, this flaw then undermines the ability to assess the impact of any intervention strategies.

Given the potential risks involved with alcohol and other drug use in the workplace, this Cochrane Review will examine the effectiveness of workplace interventions for alcohol and other drug problems. This review is important as there is very little evidence for the effectiveness of many commonly used alcohol and other drug interventions in the workplace.

Randomised controlled trials and controlled clinical trials will be included in the first instance. If no or few randomised controlled trials and controlled clinical trials are retrieved, observational studies (prospective cohort

studies, case control studies and cross sectional surveys) will also be considered.

A search of electronic databases will be conducted, as well as manual searching of conference proceedings and other grey literature. Experts in the field will also be contacted to obtain any further unpublished reports. The results of these searches will be cross-checked against references in the identified papers and previous reviews. The review is being conducted with the assistance of the Cochrane Drug and Alcohol Group.

(References available on request)

From Broome to Berrima: building Australia-wide research capacity in Indigenous offender health and health care delivery

Dennis Gray, Ted Wilkes, Simon Lenton, Steve Allsop, Julia Butt, Michael Doyle

Australia has one of, if not the, highest Indigenous incarceration rates in the OECD, which impacts profoundly on Indigenous communities. With offender populations known to endure a greater health burden compared with the general community, there is a need to develop knowledge in this area, particularly in relation to Indigenous incarceration.

Indigenous and non-Indigenous academics from Western Australia, Australian Capital Territory, New South Wales and Victoria recently received a capacity building grant from the National Health and Medical Research Council (\$2.3 million over 5 years) to develop research capacity in Indigenous offender health research. A team of Indigenous and non-Indigenous researchers will be supported to work on projects in areas critical to the health and wellbeing of Indigenous offenders.

The program of research aims to establish an Australia-wide health and criminal justice research network and increased research capacity in key health areas affecting this population (blood borne viruses, mental health and substance use). Collaborative research work, secondments to research centres and mentoring will be used to develop the knowledge and skills of a cohort of young researchers (Team Investigators) in three states. Their findings will be shared and disseminated to a wider audience through annual symposia and publications in academic journals and other media.

This is an opportunity to create an Australia-wide network for sharing knowledge in this field, and to maintain Australia's position as a world-leader in the area of offender health

research. Outcomes will include better health services for Indigenous offenders, and more generally improved health and wellbeing for those in the communities from which they come, and to which they return.

Investigators will work on collaborative projects in the areas of mental health, substance use, bloodborne viruses, impact of incarceration on Indigenous communities, and models of care for Indigenous offenders. The project has the support of several national centres and a range of experts:

Chief Investigators: Tony Butler, Michael Levy, John Kaldor, Mick Dodson, Fadwa Al-Yaman, Kay Wilhelm, Dennis Gray, Steve Allsop.

Mentors: Steve Larkin, Ted Wilkes, Stuart Kinner, Peter Schofield, Jane Freemantle, Ian Anderson, Beverley Raphael.

Team Investigators: Jocelyn Jones, Jill Guthrie, Nerelle Poroch, Kerry Arabena, Victoria Hovane, Kurt Andersson-Noorgard, Michael Doyle, James Fetherston.

Tertiary Research Intervention Via Email (THRIVE)

Jonathan Hallett, Peter Howat, Kyp Kypri (University of Newcastle), Alexandra McManus, Bruce Maycock

The prevalence of unhealthy alcohol use among young adults (aged 18-24 years) is increasing in many countries. Young people at university have a particularly high prevalence of unhealthy alcohol use and have been found to drink more heavily and to exhibit more clinically significant alcohol-related problems than their non-student peers. Internet-based methods have been shown to produce high survey response rates in this population group, and can be used to deliver interventions that address risk taking behaviours such as risky and high risk alcohol and illicit drug use.

Curtin University recently trialed the use of an Internet intervention aimed at reducing risky and high risk drinking by university students. The electronic screening and brief intervention (e-SBI) called THRIVE (Tertiary Health Research Intervention Via Email) was funded by Healthway and involved a six month randomised control trial. Invitations were sent to 13,000 undergraduates (aged 17-24 years) to complete a web-based Alcohol Use Disorders Identification Test (AUDIT).

The intervention group received 10 minutes of web-based motivational assessment and personalized feedback comprising: AUDIT score, risk feedback and peer comparisons; facts about alcohol; tips for reducing the risk of alcohol-related harm; and where medical

project notes

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help and counseling support could be found. The control group received only the screening. In total 7,237 students (56% of those invited) completed the screening; 2,435 (34%) screened positive for unhealthy drinking; 1,251 were randomly assigned to receive the intervention; 1,184 students served as controls.

Heavy drinkers who received e-SBI drank 17% less alcohol than controls 1 month after screening, and 11% less alcohol 6 months after screening. These differences in overall volume consumed were mainly driven by reductions in the frequency of drinking, though there were also small reductions in the amount consumed

per drinking episode. There were small non-significant differences between groups in the incidence of acute alcohol-related problems. In addition to the direct effects of the intervention, participant self-report after the 6-month follow-up suggests that the intervention prompted students with unhealthy alcohol use to seek help to moderate their drinking.

Of those who completed the intervention, 99% found THRIVE easy to complete, 76% said it provided personally relevant information, 55% would recommend it to a friend with a drinking problem, and 30% sought additional information on support services through the site.

This study shows that a universal screening approach is feasible and that a web-based intervention developed in consultation with potential users, and with the support of administrators, is a viable means of accessing a large, high-risk population group. It is possible that the intervention could be implemented in other educational institutions as well as medical and community settings.

(References available on request)

For more information and to view the e-SBI program visit: <http://wachpr.curtin.edu.au/thrive/index.cfm>. **cl**

abstracts

The effect of alcohol sales and advertising restrictions on a remote Australian community

Richard Midford, Deidre Young, Tanya Chikritzhs, Denise Playford, Elaine Kite and Richard Pascal

Drugs: Education, Prevention and Policy, 2009, 1–21, iFirst

Aim: To evaluate the effect of restricting hours of sale for take-away alcohol, container sizes for beverages linked to risky consumption and advertising and promotion of certain high-strength beverages on community attitudes, consumption and proxy measures of related harm in a small remote community with high levels of problematic use.

Methods: Community surveys were undertaken in the intervention community and an adjacent control community immediately prior to the introduction of the mandated restrictions and again 12 months later. Pre and post interviews were conducted with key informants in the intervention community at approximately the same times. Serial consumption and proxy harm data were collected from both intervention and control communities and changes measured over the period that voluntary and then mandatory restrictions were introduced.

Findings: There was recognition of a substantial community alcohol problem. This was accompanied by good knowledge of, and support for, the nominated restrictions prior to their mandated introduction. Subsequently, there was little opposition to their ongoing operation. Consumption of the most problematic beverage, cask wine, has reduced.

Proxy measures of alcohol harm: night-time hospital accident and emergency occasions of service; trauma-related ambulance call outs; and police-attended disturbances, also declined. Much of this change was associated with earlier, voluntary restrictions.

Conclusions: The restrictions have had a beneficial effect, but most of this occurred prior to their mandated introduction. Continuing to mandate compliance is, however, important because it validates community action, crystallizes structural change and provides a basis for further local initiatives.

Income inequality and alcohol attributable harm in Australia

Paul Dietze, Damien Jolley, Tanya Chikritzhs, Susan Clemens, Paul Catalano and Tim Stockwell

BioMedCentral: Public Health, 2009, 9, 70, doi:10.1186/1471-2458-9-70

Background: There is little research on the relationship between key socioeconomic variables and alcohol related harms in Australia. The aim of this research was to examine the relationship between income inequality and the rates of alcohol-attributable hospitalisation and death at a local-area level in Australia.

Method: We conducted a cross sectional ecological analysis at a Local Government Area (LGA) level of associations between data on alcohol caused harms and income inequality data after adjusting for socioeconomic disadvantage and remoteness of LGAs.

The main outcome measures used were matched rate ratios for four measures of alcohol caused harm; acute (primarily related to the short term consequences of drinking) and chronic (primarily related to the long term

consequences of drinking) alcohol-attributable hospitalisation and acute and chronic alcohol-attributable death. Matching was undertaken using control conditions (non-alcohol-attributable) at an LGA level.

Results: A total of 885 alcohol-attributable deaths and 19467 alcohol-attributable hospitalisations across all LGAs were available for analysis. After weighting by the total number of cases in each LGA, the matched rate ratios of acute and chronic alcohol-attributable hospitalisation and chronic alcohol-attributable death were associated with the squared centred Gini coefficients of LGAs. This relationship was evident after adjusting for socioeconomic disadvantage and remoteness of LGAs. For both measures of hospitalisation the relationship was curvilinear; increases in income inequality were initially associated with declining rates of hospitalisation followed by large increases as the Gini coefficient increased beyond 0.15. The pattern for chronic alcohol-attributable death was similar, but without the initial decrease. There was no association between income inequality and acute alcohol-attributable death, probably due to the relatively small number of these types of death.

Conclusion: We found a curvilinear relationship between income inequality and the rates of some types of alcohol-attributable hospitalisation and death at a local area level in Australia. While alcohol-attributable harms generally increased with increasing income inequality, alcohol-attributable hospitalisations actually showed the reverse relationship at low levels of income inequality. The curvilinear patterns we observed are inconsistent with monotonic trends found in previous research making our findings incompatible with previous explanations of the relationship between income inequality and health related harms.

Prescription drug misuse: Is technology friend or foe?

Suzanne Nielsen, Monica Barratt

Drug and Alcohol Review, 2009, 28, pp 81–86

Introduction and Aims: Prescription drug misuse and related harms have been increasing considerably over the past decade. At the same time, there has also been rapid growth in the use of online and Internet technologies. Thus, it is important that we understand the role online and Internet technologies play in prescription drug misuse.

Design and Methods: Published work addressing the role of technology in prescription drug misuse is explored. Topics include: Internet supply, online monitoring of prescription drug use trends and electronic prescription monitoring.

Results: Little is known about the prevalence of acquiring prescription drugs from online pharmacies. Prescription drugs are easily accessible through vendor websites, and 'rogue' no-prescription websites have proven difficult to control. There has so far been limited application of real-time monitoring to prevent overuse of prescription medications. Online monitoring of drug use trends may also prove to be a useful and timely source of information about new methods of 'off-label' prescription drug use.

Discussion and Conclusions: Technology has the potential to play a more prominent role in facilitating drug acquisition, while also enhancing the monitoring and prevention of prescription drug misuse. As technology becomes more ubiquitous in everyday life, the continued investigation of its relationship with prescription drug misuse becomes even more important. **cl**

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