



**The Australian Wine Research Institute**  
**submission to the**  
**Inquiry into Foetal Alcohol Spectrum Disorder**  
(House Standing Committee on Social Policy and Legal Affairs)

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## Forward

This submission to the House Standing Committee on Social Policy and Legal Affairs for their inquiry into and report on developing a national approach to the prevention, intervention and management of foetal alcohol spectrum disorder (FASD) in Australia, is presented by The Australian Wine Research Institute (AWRI), which is a private company limited by guarantee. The AWRI is funded by the Grape and Wine Research and Development Corporation, with matching funds from the Federal government. The AWRI formally affiliated with The University of Adelaide in 1991, and is governed by a Board, which comprises six directors elected by the Australian wineries and grape growers who pay *The Wine Grape Levy* and *The Grape Research Levy*; the Director of the Institute (*ex-officio*); and a up to four special qualification directors.

The AWRI is actively involved in education and research initiatives, independently and in conjunction with the Federal government. For example, the AWRI has supported independent research initiatives into gender differences in alcohol metabolism; health effects of alcohol and wine-derived phenolic compounds; and potential allergens in, and adverse reactions to, wine. The AWRI is also the recent recipient in conjunction with Melbourne Health of a research grant from Cancer Australia to undertake a study on the effectiveness of enhanced resveratrol containing wine on reducing biomarkers for colorectal cancer in humans, and of research grant from the Australian Education and Rehabilitation Foundation to study on the effectiveness of enhanced resveratrol containing wine on reducing biomarkers for cardiovascular disease in elderly humans with the University of Aberdeen.

The AWRI also provides alcohol-related health and nutrition lectures to wine marketing and wine science students at The University of Adelaide, University of South Australia and University of Melbourne, and at the triennial Australian Wine Industry Technical Conferences, which hosts approximately 1700 delegates, provides a workshop on alcohol-related health and nutrition. It has also produced and published an educational booklet entitled *The A-Z of information on wine and health issues*, which was initially co-sponsored by the Federal Department of Health and Aged Care. The AWRI also provides technical advice and assistance to DrinkWise Australia on request and is the co-author of a book chapter entitled *The biology of intoxication* for the book entitled *400 Rabbits: The Pain and Pleasure of Intoxication*, which is a collaboration between DrinkWise Australia and the International Centre for Alcohol Policies.

It has been demonstrated in the literature that there are readily identifiable 'at risk' groups in a population that behave differently to the 'not at risk' groups; this is reflected in their continuance of alcohol consumption during pregnancy and a consistency of the level of consumption (Hilton and Kaskutas, 1991; Mayer et al., 1991; Hankin et al., 1996; Gladstone et al., 1997; Stutts et al., 1997). Indeed, the 'at risk' groups do not generally perceive that they are significantly 'at risk' (Stutts et al., 1997).

While blanket recommendations such as warning labels on alcoholic beverages, and general campaigns and programs are effective for the 'not at risk' group, the 'at risk' groups have specific problems, which are amplified and exemplified by their excessive consumption. Therefore, specific and targeted

campaigns and programs which tackle the specificities rather than the generalities, will succeed only in reducing the incidence of FAS/FASD in these groups.

It is, therefore, recommended that the current effort and energies being expended by State and Federal governments and NGOs should be redirected to address specific and targeted education of the 'at risk' groups by their:

- community health centre(s);
- general practitioner(s); and
- obstetrician(s)/paediatrician(s).

Professional intervention to alter drinking patterns and confounding problems rather than a 'social' intervention is required.

Changing the health-risk alcohol consumption behaviours of 'at risk' groups of Australians will not happen immediately but if a partnership approach is taken and the root causes of why people drink to excess are addressed, behaviour can begin to change as exemplified above. It is important to provide all Australians and especially 'at risk' individuals and groups with balanced and factual information on the potential health effects of alcohol consumption during pregnancy, in order for them to make informed decisions on their own consumption. Informing the community is also an objective of the Australian National Preventive Health Agency.

**The following comments have been confined to areas and issues in which The Australian Wine Research Institute has access to information and mechanisms, and expertise or knowledge.**

## Introductory comments

### Amount of alcohol and alcohol-related foetal abnormalities

Alcohol consumption by pregnant women is controversial and the available evidence continues to be conflicting as to whether any amount of alcohol harms the foetus (Maier and West 2001; O'Leary 2004, 2010), as alcohol readily crosses the placental barrier. Alcohol metabolism is also slower in the foetus than in the mother and this there may be higher blood alcohol levels circulating longer in the foetal blood stream than in the maternal blood stream.

The consumption of heavy amounts of alcohol by pregnant women, including binge drinking patterns (Saval et al. 2009, Buden et al. 2010, Alvik et al. 2011), has unequivocally been associated with adverse effects on the developing foetus, although "a high level of alcohol intake alone generally does not result in a diagnosis of FAS [foetal alcohol syndrome] (Day 1992)". Alternatively, not every woman who consumes alcohol whilst pregnant, however, will give birth to a child with FAS or even a child with alcohol-related foetal abnormalities. In 1995, Abel estimated that only 4.3% of heavy consumers give birth to a child with FAS. Therefore, there are other factors that predispose or place women at greater risk of giving birth to an alcohol-affected child

Indeed, the nutritional status of the mother, her ingestion of drugs including caffeine and nicotine, and her educational, ethnicity, genetic, marital, parity and socio-economic status contribute to the development of FAS (Aase 1981, Sokol et al. 1986, Michaelis and Michaelis 1994, Abel and Hannigan 1995, Jacobson et al. 1996). A recent review by May and Gossage (2011) of maternal risk factors for foetal alcohol-related abnormalities suggests that maternal risk is multidimensional, including factors related to quantity, frequency, and timing of alcohol exposure; maternal age; number of pregnancies; number of times the mother has given birth; the mother's body size; nutrition; socioeconomic status; metabolism; religion; spirituality; depression; other drug use; and social relationships. This would also suggest that more research is needed to more clearly define what type of individual behavioral, physical and genetic factors are most likely to lead to having children with alcohol-related foetal abnormalities.

Most policy statements and guidelines regarding drinking during pregnancy are based exclusively on maternal alcohol use, and often contain statements that "no level of alcohol consumption during pregnancy is safe." It can be argued that such an approach is an over-simplification of the issue, in that there is little evidence for abnormalities among infants born of mothers reporting only light or occasional alcohol use during pregnancy (O'Leary et al. 2010 and Kelly et al. 2010).

Colin Gavaghan, an ethicist from the School of Law, Glasgow, Scotland, has highlighted potential dangers of over-strict recommendations for women during pregnancy. He argues that "the total abstinence policy currently advocated by the UK's Department of Health . . . sits uneasily with recent data and is far from ethically unproblematic. The 'precautionary' approach advocated . . . displays both scant regard for the autonomy of pregnant and prospectively pregnant women and a confused grasp of the principles of beneficence and non-maleficence" (Gavaghan 2009).

Furthermore, a meta-analysis of approximately 20,000 exposed fetuses, determined there was no evidence that moderate consumption, as distinct from light consumption, does increase the risk of foetal abnormalities, where moderate consumption was defined as greater than two standard drinks of alcohol per week but less than two standard drinks per day in the first trimester (Polygenis et al. 1998).

The most recently published study of a low amount of alcohol during pregnancy and the risk of socio-emotional problems and cognitive deficits (Kelly et al. 2010) concluded that at age 5 years, children born of mothers who consumed up to one to two drinks per week or per occasion during pregnancy, were not at increased risk of clinically relevant behavioural difficulties or cognitive defects compared with children of abstainers. This supports a study published by O'Callaghan et al. (2007) which did not observe any adverse attention, learning or cognition outcomes when less than one alcoholic drink/day was consumed although drinking more than this in late pregnancy and indeed binge drinking, was associated with an increased risk of overall learning difficulties. D'Onofrio et al. (2007), however, that polydrug use during pregnancy was a better indicator of behavioural and learning difficulties.

While a relatively recent review on the effects of low to moderate prenatal alcohol consumption (up to 83 g/week) on foetal and early infant development also concluded that there was no convincing evidence of adverse effects, methodological weaknesses in the reviewed research precluded the conclusion that alcohol consumption at any level is safe during pregnancy (Henderson et al. 2007).

The UK National Institute of Clinical Excellence, however, state that pregnant women can safely consume up to one and a half standard drinks per day after the first trimester. The recent UK guidelines of 2007<sup>1</sup> consequently now recommend abstinence during pregnancy and advise against intoxication, but importantly also recommend that women who do choose to consume alcohol before and during pregnancy, should consume no more than 8–16 g of alcohol once or twice a week.

The relationship between alcohol consumption and other pregnancy outcomes continues to be controversial, uncertain and confusing, and health advice or a warning label will not accurately assist in reducing any real risk. For every paper that claims that any alcohol negatively influences a birth outcome, another paper refutes it. For example, Kesmodel et al. (2001) observed an increased risk of preterm delivery with consumption of five or more alcoholic drinks per week at 16 weeks gestation and with consumption of more than one to two drinks per week at 30 weeks gestation but Albertsen (2004) did not with four drinks per week over the gestation period. An increased risk of preterm birth was also not observed by Parazzini et al. 2003, however, until more than three drinks on average per day were consumed.

Concerning low birth rate, while Covington et al. (2002) observed that more than 14 alcoholic drinks/week decreased birth weight and length, and lower weight at age seven years, O'Callaghan et al. (2003) did not observe this. Furthermore, Mariscal et al. (2005) observed that alcohol consumption of less than 6 g/day, actually decreased the risk for low birth weight but the risk was increased when more than 12 g/day of alcohol was consumed. The risk was decreased again when the 12 g/day was confined

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<sup>1</sup> [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_074920](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_074920)

to weekends for non-cigarette smoking women. This also shows the confounding of cigarette smoking and the importance of influence of patterns of alcohol consumption.

Concerning spontaneous abortion, while Kesmodel et al. (2002) observed an increased in risk of spontaneous abortion when five or more alcoholic drinks/week were consumed in the first trimester, which was corroborated by Henrikse et al. (2005) but at 10 or more alcoholic drinks/week, but not by Maconochie et al. (2006).

#### **Incidence of alcohol-related foetal abnormalities in Australia**

The risk and incidence of alcohol-related foetal abnormalities needs to be put into perspective for the Australian population.

Although data on the birth prevalence of FAS in Australia are limited, they suggest that population rates are substantially lower than in North America, France and Sweden (Sampson et al. 1997, Chambers et al. 20005) However, the prevalence of FAS in Indigenous Australian children is much higher than for non-indigenous children (Bower et al. 2000, Harris and Bucens 2003, Elliott et al. 2005) in keeping with findings from other Indigenous populations (May et al. 1991, Burd and Moffatt 1994, Stratton et al. 1996, Sampson et al. 1997, Chambers et al. 2005).

Concerning the West Australian data on the incidence of FAS, approximately three quarters of these diagnoses occurred in Aboriginal children; the birth prevalence was 1.1/1000 live births compared with 0.02/1000 live births for non-Aboriginal children (Bower et al. 1994). Indeed, in 1994, it was postulated that the incidence of FAS in Australia was 1 to 2/1000 live births (Lipson 1994); this estimate was from unpublished obstetric hospital data. In 1995, from data collected for the National Drug Strategy, there were no hospital admissions assigned to FAS and thus an incidence could not be determined (English et al. 1995); this was also observed in other epidemiological studies (Gibson et al. 1983, Lumley et al. 1985, Bell and Lumley 1989, Walpole 1990).

Furthermore, these data estimate that the incidence of low birth weight resulting from excessive and heavy consumption of alcohol was extremely small, 0.4/1,000. In 2000, the incidence of FAS from the Births Defects Registry in WA with additional data from the Rural Paediatric Service (RPS) database was still 0.02/1,000 for non-Aboriginal children but had increased to 2.76/1,000 for Aboriginal children in WA (Bower et al. 2000). These figures reflect the low prevalence of excessive or heavy consumption of alcohol by non-indigenous women during pregnancy in Australia. For example, as previously stated, a recent study of alcohol consumption during pregnancy in non-indigenous West Australian women, suggests that while 79.8% of women reported consuming alcohol in the three months before pregnancy, 58.7% drank alcohol in at least one trimester of pregnancy (Colvin et al. 2007) and only 4.3% of women consumed five or more standard drinks on a typical occasion in at least one trimester of pregnancy. The West Australian population of women can be considered to be representative of the population of women in the other Australian States and Territories.

Indeed, the overall incidence of FAS in Australia is low, which reflects the size of the readily identifiable 'at risk' group. These statistics have remained stable over the past decade, which reflects the size of the

readily identifiable 'at risk' groups. The incidence of FAS is higher however, in children born to indigenous Australians (Aboriginal Australians, which is consistent with other countries data for indigenous groups. The 'at risk' groups identified include indigenous Australians, heavy alcohol consumers and young Australian women. This low incidence in comparison with certain other countries, may reflect other different alcohol consumption patterns, diet and lifestyle, which could reduce confounders.

This low incidence of FAS in Australia may also reflect the high level of awareness of the potential effects of heavy alcohol consumption on the developing foetus during pregnancy. There is a myriad of print and website materials readily available for women, which have been produced by the Australian Federal and State governments, the New Zealand government, allied health organisations and other NGOs.

### **Alcohol consumption in Australian women during pregnancy**

A recent study of alcohol consumption during pregnancy in non-indigenous West Australian women, suggests that while 79.8% of women reported consuming alcohol in the three months before pregnancy, 58.7% drank alcohol in at least one trimester of pregnancy (Colvin et al. 2007). This was despite receiving advice to abstain. Interestingly, the proportion of women consuming one to two drinks on a typical occasion did not change significantly during pregnancy, but the number of occasions declined. Although the proportion of women consuming more than two standard drinks on a typical occasion declined after the first trimester, 19.0% of women consumed this amount in at least one trimester of pregnancy and 4.3% of women consumed five or more standard drinks on a typical occasion in at least one trimester of pregnancy. In the first trimester of pregnancy, however, 14.8% of women drank outside the current Australian guideline for alcohol consumption in pregnancy, although this percentage decreased to 10% in the second and third trimesters. It is the first trimester of pregnancy in particular, where there is highest risk of alcohol-related harm to the developing foetus, which is stated in the current Guidelines. The West Australian population of women can be considered to be representative of the population of women in the other Australian States and Territories.

Another similar study undertaken in Perth women suggests while 67.3% of women reported consuming alcohol before pregnancy, 32% of these women ceased consuming alcohol during pregnancy. Of the remaining 48% of these women consumed alcohol during pregnancy, 82.2% of these women only consumed up to two standard drinks per week. At 4, 6 and 12 months postpartum, 46.7%, 47.4% and 42.3% of breastfeeding women were consuming alcohol, respectively, up to two standard drinks per week (Giglia and Binns 2007). This is consistent with data drawn from the 2007 National Drug Strategy Household Survey, where 29% of the 23,356 women consumed alcohol during pregnancy (Maloney et al. 2011). Ninety-five percent of these women, however, reduced the quantity of alcohol consumed during pregnancy and breastfeeding. A higher prevalence of alcohol consumption was reported among women who were breastfeeding only (43%), or pregnant and breastfeeding (at the same time) in the past 12 months (36%). These results suggest that even though most women (94%) stop or reduce drinking alcohol during pregnancy, many women return to drinking alcohol postpartum and while breastfeeding, and hence support previous observation that suggest a lack of knowledge among mothers on breastfed children.



Interestingly, from a 1988 study of changes in alcohol usage during pregnancy in a sample of 112 pregnant South Australian women, 86 of whom drank alcohol before pregnancy, one hundred per cent of drinkers reported reduced consumption of alcohol. A reduction in drinking during pregnancy was related directly to an antenatal emotional attachment to the fetus and related inversely to feelings of irritability towards the fetus (Condon and Hilton 1988).

#### **Awareness of the risks of alcohol consumption during pregnancy**

The available data relating to the level of awareness amongst women of childbearing age of the risk of *consuming alcohol when planning to become pregnant and during pregnancy in Australia* suggests that the level of awareness is high. A woman's age, past pregnancy and current alcohol consumption as well as attitudes towards alcohol consumption during pregnancy, appears to be the strongest predictors of alcohol consumption in pregnancy (Maloney et al. 2011, Peadon et al. 2011). It is probable that older women who have had previous pregnancies are less anxious about the risks associated with alcohol consumption during pregnancy. Strong predictors of risky parental (maternal and/or paternal) alcohol consumption include being male, being a current tobacco smoker, reporting higher levels of psychological distress and having a lower level of education (Maloney et al. 2010).

## **1. Prevention strategies**

Different alternative solutions need to be considered for each at risk group, although there is some cross over or overlap for the general community. They include brief medical interventions for pregnant women and the general population and primary, secondary and tertiary education for adolescents and young adults as well as pregnant adolescents and young adults..

### **1.1 Pregnant women and brief medical interventions**

#### **1.1.1 Pregnant women**

Women's past pregnancy and current drinking behaviour, and attitudes to alcohol use in pregnancy appear to be the strongest predictors of alcohol consumption in pregnancy (Peadon et al. 2011). This was the conclusion drawn from a national cross-sectional survey via computer assisted telephone interview of 1103 Australian women aged 18 to 45 years. The majority of women interviewed (89.4%) had consumed alcohol in the last 12 months, although approximately half the respondents drank two standard drinks or less on a usual day when they consumed alcohol (50.8%), while 14.6% of women typically drank five or more standard alcoholic drinks on a drinking occasion. During their last pregnancy (n = 700), 34.1% drank alcohol and when asked what they would do if planning a pregnancy (n = 1103), 31.6% said they would consume alcohol. Interestingly, women who disagreed with the statement that 'pregnant women should not drink' were more likely to intend to drink alcohol during a future pregnancy, as were women who had neutral or positive attitudes towards alcohol consumption in pregnancy. Women with more frequent current alcohol use such as drinking on five or more days per week and women who currently drink higher amounts of alcohol such as drinking seven or more drinks in a day were more likely to intend to drink alcohol in a future pregnancy.

Although knowledge and attitudes are important potential influences of behaviour (Meillier et al. 1997), awareness of the effects of alcohol in pregnancy alone is not sufficient to change women's behaviour (Chambers et al. 2005). Attitudes were a much stronger predictor of alcohol consumption during pregnancy than knowledge. Peadon et al. (2010) have previously reported a disjunction between women's knowledge and attitudes towards alcohol consumption in pregnancy.

Targeted interventions for women at higher risk of alcohol consumption in pregnancy are thus needed to change women's risk perception and behaviour. Both community and individual interventions should take into consideration the role partners can play and the frequent co-occurrence of smoking and alcohol consumption. This reinforces the need for an integrated approach to promoting a healthy pregnancy including timely antenatal care, appropriate maternal nutrition, folate supplementation and efforts to reduce the use of alcohol, tobacco and illicit drug use in pregnancy. An evidence-based alternative solution to health warning labels for pregnant women is a brief medical intervention as a key in any integrated approach.

### 1.1.2 Brief medical interventions

A strategy that has shown to be effective in Canada and the USA, both in terms of cost and in decreasing risky alcohol consumption, including in 'at risk' groups, are brief interventions, that is, the screening and interviewing of pregnant women or those planning pregnancy, by primary health care providers. Data from the Canadian Community Health Survey of 2007/08 demonstrated that brief interventions which involve general practitioners, as well as increase the use of general practitioners by pregnant women, are effective in reducing alcohol consumption during pregnancy (Thanh and Jonsson 2010).

Australian primary health care providers have already identified, as have the State and Federal governments and NGOs, that better and more education, training and tools are required to instigate these brief interventions and hence to prevent and reduce the occurrence of FAS/FASD. This strategy is also included as a primary strategy for reducing risky alcohol consumption during pregnancy and the risk of the birth of an alcohol-affected child in both State and Federal governments', and NGO's plans and policies.

Professional intervention to alter drinking patterns and confounding problems rather than a 'social' intervention is required.

Primary health care providers, that is, general practitioners, as well as obstetricians, midwives and nurses, and even dietitians and nutritionists, play a pivotal role in identifying both pregnant women and those planning pregnancy at high risk of giving birth to an alcohol-affected child, and providing them with advice, counseling, treatment and referral as appropriate. This strategy has unanimous support among the American College of Obstetricians and Gynecologists, the American Academy of Paediatrics, the US Office of the Surgeon General and the US Department of Health and Human Services.

Validated screening instruments are available for screening pregnant and non-pregnant women of reproductive age including T-ACE, TWEAK and AUDIT (Floyd et al. 2005; [www.nih.gov/publications/Assessing/Alcohol/Index.htm](http://www.nih.gov/publications/Assessing/Alcohol/Index.htm)).

Brief interventions involved one to three short (5-10 minute) sessions comprised of personal feedback on alcohol-related health problems and risk, as well as advice, options of treatment and self-help (Ockene et al. 1999, Chang et al. 1999, 2000, 2005, 2006, Reiff-Hekking et al. 2005). Several controlled studies have examined the effectiveness and impact of brief interventions with pregnant women, and all concur that pregnant women following the brief intervention were up to five-times more likely to abstain from alcohol completely or at least reduce their alcohol consumption from heavy to light, with improved birth outcomes (Hankin et al. 2000, Handmaker and Wilbourne 2001, Hankin 2002, Sokol et al. 2003, O'Connor and Whaley 2007, Chang 2004). Inclusion of the pregnant woman's partner in the brief intervention improved the outcome for heavy alcohol consumers (Chang et al. 2005). Thus brief interventions appear to be an appropriate effort to modify problematic and potentially problematic alcohol consumption and to avert its adverse consequences in at risk pregnant women or those planning pregnancy. Even for women who are not 'at risk', a routine screening provides an opportunity to discuss the health effects of alcohol consumption in a nonjudgmental, health-orientated setting to convey the message that these issues are important to the pregnancy and birth outcomes.

Motivational interviewing involves more comprehensive counseling and guides the recipients to explore their ambivalence about changing behaviour while focusing on the perceived discrepancy between current behaviours and overall goals (Miller and Rollnick 2002). It is particularly effective in reducing the consumption of heavy consumers. For example, in a pilot study of motivational interviewing, which was an empathic, participant-centred but directed session focusing on the health of the participant's unborn baby, all participants reduced their alcohol consumption and maximum blood alcohol concentrations throughout their pregnancy (Handmaker et al. 1999). Motivational interviewing also appears to be effective for different age groups, including young adult women who are at increased risk for an alcohol-exposed pregnancy owing to regular binge drinking behaviour combined with ineffective contraception (Ingersoll et al. 2005).

Another pilot study entitled the Project CHOICES targeted non-pregnant women at high risk of a heavy alcohol-exposed pregnancy and hence giving birth to an alcohol-affected child (The Project CHOICES Intervention Research Group 2003). It consisted of four brief motivational interviews. At the six-month follow-up, 68.5% had reduced their risk.

There are other factors that predispose or place women at greater risk of giving birth to an alcohol-affected child. These factors and hence 'at risk' groups of women that have been identified include: maternal age; gravidity and parity (Sokol et al. 1986, Jacobson et al. 1996); marital and socio-economic status (Abel 1995, Chambers et al. 2005); ethnicity (Abel and Hannigan 1995); genetics (Goodlett et al. 1989, Streissguth and Dehaene 1993, Rasheed et al. 1997, Su et al. 2001, Warren et al. 2001, May et al. 2004); nutritional status (May et al. 2004); polydrug use including cigarette smoking and caffeine, cocaine and marijuana use (D'Onofrio et al. (2007); and maternal alcohol metabolism (Chernoff 1980, Warren et al. 2001), as well as length of alcohol drinking 'career' (May et al. 2004). A potential adjunct to motivational interviewing is therefore screening for alcohol consumption and other drug use during pregnancy. While a study published by O'Callaghan et al. (2007) did not observe any adverse attention, learning or cognition outcomes when less than one alcoholic drink/day was consumed, drinking more than this in late pregnancy and indeed binge drinking, was associated with an increased risk of overall learning difficulties. D'Onofrio et al. (2007), however, that polydrug use during pregnancy was a better indicator of behavioural and learning difficulties.

New clients of the antenatal clinic at a large Queensland public hospital appeared open to being asked about their use of alcohol and other drugs as part of their initial routine screening by midwives, and 85% were comfortable about being screened for substance use during pregnancy (Seib et al. 2011). The screening instrument was the Alcohol Use Disorders Identification Test-C (AUDIT-C), which was introduced into public antenatal services throughout Queensland in 2008. More importantly, few of the women surveyed further reported feeling judged by the midwife taking their clinical histories. When survey data of the women who identified as using multiple substances were compared with screening results, both the sensitivity and the positive predictive value of the brief screening instrument was high (Seib et al. 2011), although further examination of the survey data revealed some differences between past and current patterns of substances use that were not fully detected by the screening instrument.

### **1.1.3 General population and brief medical interventions**

These brief medical interventions can also be extended to be effective for the general population, and are positively perceived by the general Finnish populations, for example (Makela et al. 2011). They appear to be particularly effective in primary care settings, emergency departments and college student health centres (Botelho et al. 2011). The literature, however, suggests that medical students and practitioners are not necessarily adequately trained in alcohol-related issues identify early abuse and dependence, intervene, and to give appropriate advice/recommendations about alcohol. Medical school curriculum and continuing medical education on alcohol abuse and addiction should be required of all students and practitioners so they can be best prepared to prevent problems and identify and treat those for whom prevention has failed.

## **1.2 Health warning labels**

The introduction of alcohol warning messages placed on alcohol labels would most likely increase in awareness, initially, but there would be no change in maternal alcohol consumption behaviours and the incidence of alcohol-related foetal abnormalities, which is based on investigations conducted after the introduction of warning labels for alcoholic beverages in the USA. Any change to legislation should be evidenced based, and on sound science.

The evidence that alcohol warning messages placed on alcohol labels will not change alcohol consumption behaviours comes from approximately 39 original research studies following the introduction of such warning labels in the USA. These studies specifically investigated the effectiveness of health warnings on the labels of alcoholic beverages; 35 were based only on US data, and two a comparison of US and Canadian data. While there was an increase in awareness of, exposure to and recognition memory of the label in the USA, health warning labels on alcoholic beverages are ineffective at changing consumer behaviour (MacKinnon et al. 2000), there was no beneficial change in beliefs and alcohol consumption attributable to the warning in beliefs, particularly in 'at risk' groups. Awareness and knowledge of labels are not associated with behavioural change. Furthermore, within four years after the introduction of warning labels awareness plateaued (Greenfield and Kaskutas 1998).

As concluded by Stockwell (2006) "Reviews and primary studies concerning the impacts of the US alcohol warning label experience...agree fairly closely that impacts on drinking behaviour are either nonexistent or minimal." A similar conclusion was made by Wilkinson and Room (2009), who concluded that "these evaluations find little evidence that the introduction of warning labels in the USA had any impact on drinking behaviour, although there is evidence that they led to an increase in awareness of the message they contained."

It is unlikely, however, in the absence of a wide range of other strategies to encourage Australians to consume alcohol more responsibly, that the alcohol warning labels would on their own result in an overall reduction in heavy alcohol consumption or specific risk behaviours such as risking adolescent and young adult drinking, and heavy alcohol consumption by pregnant women.

### **1.2.1 Evidence from US investigations specifically on pregnant women**

The health warning label for alcoholic beverages "women should not drink alcoholic beverages during pregnancy because of the risk of birth defects", was legislated and enacted in the USA in November 1988 as the *Alcoholic Beverage Labelling Act 1988* under the *Omnibus Drug Act 1988*, approximately 20 years after it was first proposed. It was primarily introduced in response to uncertainties of the state of knowledge in 1988. For example, while heavy maternal alcohol consumption was associated with foetal alcohol syndrome (FAS), the data on light to moderate maternal alcohol consumption were inconsistent and inconclusive. Thus it was considered prudent to recommend that the only 'safe' level of consumption during pregnancy was complete abstinence. It was also introduced along with another warning label because of the escalating economic and health 'costs' of alcohol-related problems in the USA.

US legislators assumed that knowledge of specific health warnings on labels equates with a change in behaviour specific to that health warning, that is, for an 'intervention' to be effective, the label had to be observed and changes first needed to occur in knowledge of the risk associated with a behaviour. This is not the case.

One year following inclusion of the health warning labels for alcoholic beverages in the USA, there were increases in the awareness, exposure and recognition memory of the general public; this change was slow to grow (Mayer *et al.* 1991, Scammon *et al.* 1992). Exposure, however, was inconsistent across populations, where 6 and 18 months after their introduction, men, 18–29 year-olds, heavy consumers and the tertiary educated had more likely seen the labels than the other populations groups (Kaskutas and Greenfield 1992, Graves 1993, Greenfield *et al.* 1999). Even 50 months after their introduction, women older than 29 years were less likely to have seen the warning labels.

From these initial studies, however, there were no significant or substantial positive changes in actual or intended behaviour regarding the consumption of alcohol, or in the attitudes, beliefs and perceptions about the risks described on the warning labels (Mayer *et al.* 1991, Marzis *et al.* 1991, Kaskutas and Greenfield 1992, Greenfield *et al.* 1993, Hilton 1993, McKinnon *et al.* 1993, US Department of Health and Human Services 1993); significant funding for the studies has been provided by the National Institute on Alcohol Abuse and Alcoholism. Furthermore, the general public who consumed a chronic heavy amount of alcohol, that is, one of the groups 'at risk', believed that there was less risk associated with the consumption of alcohol than those who abstained, or consumed a light or moderate amount of alcohol (Andrew *et al.* 1991, Patterson *et al.* 1992, Hankin 1994).

In addition, data from a study of African Americans, that is, another 'at risk' group, showed also that while awareness changed, behaviour did not (Hankin *et al.* 1993a, 1993b, Hankin *et al.* 1995). Indeed, the decrease in maternal consumption was relatively minor (approximately a half to one drink per week, an amount which would not be expected to influence their pregnancy) and did not impact on the heavy consumers. A subsequent study of pregnant urban Native and African Americans showed that although frequently exposed to the warning labels, only 20% knew that FAS was related to alcohol consumption and all were uncertain about the actual consequences of FAS, or about the value of reducing intake at any time during pregnancy (Kaskutas 2000).

The results from these subsequent studies are consistent with initial studies which suggested that women 'at risk' were less responsive to media/promotion campaigns (Little *et al.* 1981; Streissguth *et al.* 1982, Weiner *et al.* 1989, Kaskutas and Graves 1994, Kaskutas *et al.* 1998). This implies that targeted education efforts are required for the 'at risk' group.

While it may be argued that 18 to 24 months post implementation may be insufficient time to observe changes in the overall consumption of alcohol (Scammon *et al.* 1991), data from a six-year study of African Americans showed also that while awareness changed initially and then plateaued after approximately three years of warning labels, there was no change in the behaviour of a specific 'at risk' group of chronic and heavy consumers of alcohol (Hankin *et al.* 1993a, 1993b, Hankin *et al.* 1995). Yet another study observed that in an 'at risk' group, multiparae ignore the labelling and actually increase

their consumption of alcohol whilst pregnant (Hankin *et al.* 1996). This is despite the increased risks for alcohol-related birth defects with increasing age. Indeed, warning labels, similar to other communication-only strategies or tools, are less effective in reducing alcohol consumption among pregnant women (Kaskutas *et al.* 1998).

Interestingly, while alcohol consumption among pregnant US women declined from 1988 to 1992, it subsequently increased from 1992 to 1995 (Ebrahim *et al.* 1998). Of more significance, however, was the initial decrease followed by subsequent increase in frequent alcohol consumption from 1998 to 1995, where 87% of frequent consumers 'binged' and were also cigarette smokers.

Furthermore, there is no evidence to suggest that there has been a decrease in the incidence of FAS since warning labels were introduced, and indeed the data available suggest that the incidence of FAS has remained relatively stable over the past decade in the USA (Ebrahim *et al.* 1998, Eustace *et al.* 2003, Sokol *et al.* 2003, Astley 2004).

Another likely outcome is the vilification of pregnant women who consume alcohol, either privately or publicly. Biased and/or distorted estimates of risk implied on the health warning labels that the consumption of any alcohol during pregnancy will adversely affect the foetus, may lead women to abort their foetuses unnecessarily or, at a minimum, to experience debilitating anxiety and guilt (Weiner *et al.*, 1989).

### **1.2.2 Additional evidence from US investigations into general health warning labels**

One of the health warning label for alcoholic beverages that was mandatorially introduced in 1988 was the "Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems". Research results indicate that the 'at risk' group of drink drivers recalled readily the warning label, however, recall had no significant effect or impact on the risk assessment of, for example, driving after consuming two or more alcoholic drinks. Additionally, this group considered that drink driving was less risky than the general, 'not-at-risk' public (Parker *et al.* 1994). Other research indicates that the perceived level of risk associated with drink driving decreased following the introduction of the warning label (Greenfield and Kaskutas 1993).

It is considered that product warnings cannot readily and reliably be targeted to 'high risk' groups and individuals, such as excessive consumers of alcohol, whether regular consumer or 'binge drinkers', and whether young or older adults. The personal experiences affecting judgments of personal risk, motivations for high risk behaviour and the individual pharmacological and physiological properties of, and responses to, alcohol, all make the design of warnings that are effective with these individuals difficult.

In the USA, five years after their introduction, while there was an increase in the awareness of adolescents and young adults of the warning labels, there was no effect on alcohol consumption behaviours (MacKinnon *et al.* 1993). Ten years after their introduction, the initial increased awareness of the warning labels leveled off for adolescents, consistent with theories of repeated exposure to persuasive information (Mackinnon *et al.* 2000). The alcohol warning had also not affected adolescents'



beliefs about alcohol or alcohol-related behaviors, and neither increased or decreased their alcohol consumption (MacKinnon et al. 2001).

Young people, for example, who are an 'at risk' group, may have difficulty in judging or perceiving risks associated with alcohol consumption. Indeed, exposure to the warning label does not act as a deterrent for young adults (MacKinnon et al. 2001), may actually increase their intention to consume alcohol (Synder and Blood 1992). This is because if an event has not occurred to an individual, and he/she cannot associate it with a certain risk, then the individual may perceive that the risk may not occur in the future—that is, the risk is not related or relevant to them personally (Patterson *et al.* 1992). Also, 'at risk' individuals apparently give greater weight to uneventful experiences with alcohol interpreted to indicate that it carries low risk (Cvetkovich and Earle 1994, 1995). Indeed, the possibility that there are different reasons and motivations for high-risk behaviour makes it difficult to target messages to these individuals. Heavy alcohol consumers also perceive the risk of alcohol-related harm as low and less believable (Andrews et al. 1991, Andrews 1995) than do light alcohol consumers.

Results from a relatively recent ethnically diverse sample of US high school students involved in a multi-media, peer-reviewed educational presentation designed to reduce the incidence of foetal alcohol syndrome (FAS), demonstrates that while the presentation increased participant's knowledge regarding FAS, it had no effect on participants' attitudes, beliefs about the potential harms of consuming alcohol whilst pregnant or, importantly, their intention to consume alcohol whilst pregnant (LaChausse 2006).

Results from a study of both US and Australian college/university students, demonstrates that young Australian women perceive less risk associated with consuming alcohol whilst pregnant than young American women, and in particular for low levels of alcohol consumption (Creyer et al. 2002). Less risk is also perceived by both Australian and American young women binge drinkers. This statistic is particularly relevant as one of the 'at risk groups' for having an alcohol-affected child is heavy alcohol consumers in either continuous or binge pattern. In Australia, 18% of 18-23 year-old women binge drink once a week or more, that is, they consume five or more standard alcoholic drinks on one occasion, while 21% binge drink once a month, compared to 6% and 8% 45-50 year-old women, respectively, although only 0.6% of 18-23 year-old women currently consume heavy amounts of alcohol continuously (Carr-Gregg et al. 2003, Clemens et al. 2007). Among another 'at risk group', 14% of 18-24 year-old Indigenous Australian women binge once a week or more although 25-34 year-old Indigenous Australian women have the highest rate of binge drinking (<http://www.abs.gov.au/AUSSTATS/abs@.nsf/mf/4832.0.55.001/>). Heavy alcohol consumption is associated with an increased risk of other health-risk behaviours such as unsafe sex and correspondingly unplanned pregnancies (PHE 19. Canberra: Australian Institute of Health and Welfare, 1999). The average age of having a baby in Australia is currently 27-29 years (AIHW Cat. No. PER 29; Perinatal Statistics Series No. 16.).

Furthermore, health consciousness is also not related to either moderate or heavy alcohol consumption such that health conscious individuals are not more likely to accept health warning labels (De Carlo 1997). Eleven years after their introduction in the USA, Greenfield et al. (1999) concluded that there was

no evidence that seeing a health warning label was related to engaging in conversations about drinking alcohol and adverse health outcomes, let alone changing health-risk drinking behaviours.

### **1.2.3 Conclusions regarding the appropriateness and effectiveness of health warning labels as a prevention strategy**

Indeed, concerning health warning labels for alcoholic beverages, despite an increase in awareness of, and memory or recognition for, the alcohol warning labels, over the past two decades since its introduction in the USA, there has been no demonstrable effect of the warning on risk perception (Scammon et al. 1991, Hilton 1993, MacKinnon et al. 1993, Edwards et al. 1994, Andrews 1995). Similarly, changes in alcohol consumption behaviour attributable to the health warning labels have not yet been observed (Hilton 1993, Hankin 1996). Indeed, although young (women) adults, Indigenous alcohol consumers, adolescent and young adult consumers, and heavy alcohol consumers, which are identified as 'at risk' groups, are more aware, disbelieve and discount such information, and are less likely to modify their pattern of alcohol consumption than 'not-at-risk' consumers (Andrews et al. 1991, Andrews 1995, Mazis et al. 1991, MacKinnon 1995, DeCarlo 1997, MacKinnon et al. 2001). Indeed, examining data from 1990 to 1994, Greenfield et al (1999) reported that across all years, controlling for age, gender, education and alcohol consumption, people who had seen the warning label were more likely to drive after drinking too much, but also to say they had deliberately not driven after drinking during the past year.

Thus, although the groups most 'at risk' and 'in need' of adopting the information of the alcohol warnings are aware of, and can recall, the information in warning labels, they are, however, the least likely to accept the warnings.

Furthermore, another 'at risk' group is Indigenous Australians. Although indigenous Australians are more likely to abstain completely from alcohol than non-indigenous Australians, those who do consume alcohol are more likely to drink at risky levels. 56% of indigenous Australians drink at a level of low risk compared to 74% of other Australians. 23% of indigenous Australians consume at high risk levels compared to 10% of other Australians. The issue of alcohol consumption and consumption of other substances in the rural indigenous communities and in urban areas is a complex one requiring identification of cultural, socio-economic and other factors in order to tailor targeted programs as well as ensuring that the wider population-based educational and social marketing measures are relevant to the indigenous population. Simplistic health warning labels will not positively impact on this 'at risk' group's behaviour.

The level of information, including language, needs to be appropriate for each target 'at risk' group, but the information provided should be balanced. Research suggests that telling an individual that a behaviour is harmful or providing information about the risk associated with a behaviour is insufficient to affect an individual's actions, while increasing an individual's knowledge about a health risk does not necessarily cause that individual to change or modify negative or risky behaviour (Engs 1989).

It is, therefore, considered that health warnings on product labels cannot readily and reliably be targeted to 'at risk' groups and individuals, such as excessive consumers of alcohol, whether regular consumers or 'binge drinkers'. The personal experiences affecting judgments of personal risk, motivations for high risk behaviour and the individual pharmacological and physiological properties of, and responses to, alcohol, all make the design of warnings that are effective with these individuals difficult.

### **1.3 Primary, secondary and tertiary education**

It is important to recognise that warning labels will not always result in message exposure to all those at risk, such as the at risk adolescent and young adult populations who primarily consume alcohol in clubs and pubs or in homes, where alcohol is presented in a glass rather than an alcohol beverage container.

Prevalence rates of alcohol consumption generally increases rapidly from early to late adolescence and typically peaks in young adults, and is a function of negative pro-alcohol social influences in their social environment combined with individual psycho-social vulnerabilities to those influences (Griffin and Botvin 2011). Education is needed for this at risk population who regularly engage in binge drinking patterns combined with risky sexual behaviours and no or ineffective contraception and, therefore, are at increased risk of an unplanned alcohol-exposed pregnancy. Furthermore, the education should be extended from merely alcohol consumption during pregnancy to alcohol consumption per se for this age group, and for both genders. Indeed, it is estimated that around one-third of people aged 18–29 years recently consumed alcohol at risky levels, (Australian Institute of Health and Welfare, 2006).

#### **1.3.1 Adolescents and young adults, and primary, secondary and tertiary education**

School-based alcohol prevention has generally been perceived to be ineffective as reviews are primarily related to research emanating from the USA where programs emphasize abstinence from alcohol as the aim of the program (Babor et al. 2003, Foxcraft et al. 2003). School-based harm minimization programs, however, are potentially more effective in the Australian alcohol drinking culture as exemplified by the School Health and Alcohol Harm Reduction Project (SHAHRP). The results from other studies that have evaluated the impact of their school-based program using harm minimization outcomes such as drunkenness and intoxication, have also shown that an alcohol misuse outcome is an achievable aim, in contrast to an abstinence outcome, for example, the percentage of students who have tried alcohol (Ellickson et al. 2003, McBride et al. 2004). Effective programs include three important components, namely information, normative education and alcohol refusal/resistance skills. They are also very interactive, skills-focused and implemented over multiple years (Griffin and Botvin 2011). Impediments to effectiveness of any program are also, naturally, poor teacher training (including high levels of complexity, lack of integration into the syllabus and long length of the program) as well as poor teacher delivery. There are Australian computer-based harm minimization school-based program which reduce or remove these impediments, such as the CLIMATE Alcohol Course. Family interventions that combine parenting skills and family binding components are also effective.

#### **1.3.2 The School Health and Alcohol Harm Reduction Project (SHAHRP)**

The School Health and Alcohol Harm Reduction Project (SHAHRP) aimed to reduce alcohol-related harm by enhancing students' abilities to identify and deal with high-risk drinking situations and issues. The SHAHRP study involved a quasi-experimental research design, incorporating intervention and control groups and measuring change over a 32-month period. The study occurred in metropolitan, government secondary schools (13 to 17-year-olds) in Perth, Western Australia. The 14 intervention and control schools involved in the SHAHRP study represent approximately 23% of government secondary schools in the Perth metropolitan area. The sample was selected using cluster sampling, with stratification by

socio-economic area, and involved over 2,300 intervention and control students from junior secondary schools. The retention rate of the study was 75.9% over 32 months. The intervention incorporated evidence-based approaches to enhance potential for behaviour change in the target population. The intervention was a classroom-based program, with an explicit harm minimization goal, and was conducted in two phases over a 2-year period. The results were analysed by baseline context of alcohol use to assess the impact of the program on students with varying experience with alcohol. Knowledge and attitudes were modified simultaneously after the first phase of the intervention in all baseline context of use groups. The program had little behavioural impact on baseline supervised drinkers; however, baseline non-drinkers and unsupervised drinkers were less likely to consume alcohol in a risky manner, compared to their corresponding control groups. In line with program goals, early unsupervised drinkers from the intervention group were also significantly less likely to experience harm associated with their own use of alcohol compared to the corresponding control group. Unsupervised drinkers experienced 18.4% less alcohol-related harm after participating in both phases of the program and this difference was maintained (19.4% difference) 17 months after the completion of the program. This study indicates that a school drug education program needs to be offered in several phases, that program components may need to be included to cater for the differing baseline context of use groups, and that early unsupervised drinkers experience less alcohol-related harm after participating in a harm reduction program (McBride et al. 2003).

### **1.3.3 CLIMATE Alcohol Course**

The Clinical Management and Treatment Education (CLIMATE) Alcohol Course is a computerized school-based intervention for alcohol misuse in adolescents ([www.climateschools.tv](http://www.climateschools.tv)). This course was developed from the collaborative efforts of health and education professionals in conjunction with secondary school students and teachers. It is a computerized cartoon-based interactive program that is embedded with in the Personal Development, Health and Physical Education (PDHPE) curriculum and meets set outcomes of the syllabus. The computerized delivery allows for standardized, complete and correct course delivery with minimal training and effort (Schinke et al. 2004).

To establish the effectiveness of the CLIMATE alcohol course, a cluster randomized controlled trial was conducted in 16 secondary schools in Australia (n=1466) (Vogel et al. 2006). Eight schools were randomly allocated to the computerized prevention program and eight schools to their usual classes. The main harm minimisation outcomes tested were changes in alcohol knowledge, alcohol use, alcohol-related harm, and alcohol expectancies. Results at 12 months after the intervention indicated that the CLIMATE alcohol course was more effective for all students than usual PDHPE classes in increasing alcohol-related knowledge and decreasing positive expectancies about alcohol. In terms of alcohol use, the computerized program was effective in decreasing average alcohol consumption and the frequency of binge drinking (drinking in excess), and alcohol-related harm for girls only. No behavioural effects were found, however, to be significant for the boys (Vogel et al. 2006, 2009).

A subsequent trial in another ten secondary schools showed that there were significant improvements in knowledge regarding alcohol use at immediate and 6 month follow up (Newton et al. 2009). Average weekly alcohol consumption was reduced immediately after the intervention. No differences between

groups were found on alcohol expectancies, frequency of drinking to excess and harms related to alcohol use over time, which supports the initial study that the CLIMATE alcohol course is an as an effective school-based program in increasing alcohol knowledge and reducing alcohol use and misuse in the short term.

Interestingly, a study of alcohol consumption in 34,001 students in Cyprus, France, Hungary, Iceland, Ireland, Lithuania, Malta, the Slovak Republic, Slovenia, Sweden and the United Kingdom participating in the 1999 European School Survey Project on Alcohol and Other Drugs Study (Bjarnason et al. 2003) suggests that adolescent or underage drinking is more common in all types of non-intact families; this was observed in all 11 countries. The adverse effect of living in non-intact families is greater in societies where alcohol availability is greater and where adolescents drink more heavily. A combination of school-based approaches, involving curricula targeted at preventing alcohol, tobacco, or marijuana use and extracurricular approaches, offering activities outside of school in the form of social or life skills training or alternative activities, may be effective in reducing underage drinking (Komro and Toomey 2002).

#### **1.3.4 Tertiary education**

Concerning tertiary education, computerized or on-line alcohol programs may be particularly effective for 'at risk' groups such as adolescents and young adults who are less likely to access traditional alcohol-related services such as medical practitioners (White et al. 2010). A US-developed on-line alcohol program for first year tertiary students is AlcoholEdu. Results at 30 days after the intervention indicated that AlcoholEdu is effective for all students in decreasing average alcohol consumption and alcohol-related harm, as well as influencing student's attitudes towards alcohol (Lovecchio et al. 2010). Non-completion of the on-line alcohol program was correlated with drinking in excess (Abrams et al. 2011).

In addition, there is data which suggest that computerized or on-line alcohol programs may also be effective for pregnant women (Tzilos et al. 2011), as well as for the general adult population (Boon et al. 2011) to change health-risk alcohol consumption patterns.

In summary, to change the behaviour of an individual is complex, and labelling is a simplistic intervention. Interventions to reduce risky alcohol drinking must make an individual:

- feel personally susceptible to a health (or other) risk;
- believe that the risk can cause a significant harm; and
- know what actions can be taken to avoid the harm, and also know the cost or benefit of the actions. If the costs outweigh the benefits, the action to avoid the harm is unlikely to be taken.

## 2. Intervention needs - tools

The medical and scientific literature highlights limitations in the current provision of services for women using alcohol and other drugs during pregnancy. These limitations may be associated with late presentation at antenatal services, poor retention of pregnant substance users in antenatal care, the nature of educational material on substance use that is provided to pregnant women and their partners and the adequacy of antenatal screening for substance use ( Burns et al. 2006, Saitz et al. 2006 ).

Screening for use of alcohol and other drugs in pregnancy is an important part of prevention. It has been suggested that screening for alcohol consumption before pregnancy may predict alcohol consumption during a pregnancy (Chang et al. 2006, Saitz et al. 2006). It has also been suggested that maternal alcohol consumption is influenced by the alcohol consumption of male partners (Leonard and Mudar, 2003), and that current smoking status can identify women likely to consume alcohol or use other drugs during pregnancy (Saitz et al. 2006). These suggestions highlight the need for comprehensive screening for the use of tobacco, alcohol and other drugs in antenatally.

Australian primary health care providers have already identified, as have the State and Federal governments and NGOs, that better and more education, training and tools are required to instigate these brief interventions and hence to prevent and reduce the occurrence of FAS/FASD.

Indeed, the impediments to implementing the screenings, brief intervention and motivational interviewing include commitment, inadequate knowledge and skills among health care providers. including obstetricians, general practitioners, midwives and nurses, reinforced by limited education and training in medical school and in general practice, lack of time, and system barriers such as lack of intervention tools, protocol, referral or treatment resources (Nevin et al. 2002, Mengel et al. 2006, Seib et al. 2011). These impediments have been identified by both US and Australian primary health care providers.

In a survey of 1,143 primary health care providers in Western Australia, only 45% routinely ask about alcohol consumption during pregnancy and only 25% routinely provide information on the potential consequences of heavy alcohol consumption during pregnancy and only 13% provide advice consistent with the current NHMRC Australian Alcohol Guidelines. They identified the need for educational material for both their patients and themselves (Payne et al. 2005, Elliot et al. 2006, Peadon et al. 2007).

A Healthy Habits training program was effectively initiated in the USA to address clinician certainty and confidence in diagnosing problematic alcohol consumption (Seale et al. 2005).

Concerning primary health care for Indigenous Australian and Torres Strait Islander women, the provisions of maternity services must also be culturally relevant and culturally safe to be effective (Kruske et al. 2006). Guidelines and strategies for such provisions are being addressed (Queensland Health. Strategic policy for Aboriginal and Torres Strait Islander children and young people's health

2005–2010. Brisbane: Strategic Policy Branch, Queensland Health, 2005; *National Report Fetal Alcohol Syndrome National Workshop 2002*. Australian National Council on Drugs and National Expert Committee on Alcohol).

Validated screening instruments are available for screening pregnant and non-pregnant women of reproductive age including T-ACE, TWEAK and AUDIT and AUDIT-C (Floyd et al. 2005; [www.nih.gov/publications/Assessing/Alcohol/Index.htm](http://www.nih.gov/publications/Assessing/Alcohol/Index.htm)).



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