Understanding Smoking by Pregnant Aboriginal Women

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School of Medicine and Public Health
University of Newcastle

VOLUME 1
Statements

Statement of originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University’s Digital Repository, subject to the provisions of the Copyright Act 1968.

Statement of authorship

I hereby certify that this thesis is submitted in the form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement from each co-author, endorsed by the Faculty Assistant Dean (Research Training), attesting to my contribution to the joint publications.

Acknowledgement of collaboration

I hereby certify that the work embodied in this thesis has been done in collaboration with other researchers, and carried out in other institutions. I have included as part of the thesis a statement clearly outlining the extent of collaboration, with whom and under what auspices.

24th June 2014

__________________________
Megan Passey

Date
Statement regarding collaboration

Consistent with guiding principles for conducting research in Aboriginal and Torres Strait Islander health, the research for this thesis was conducted in collaboration with community representatives and with relevant health services. Specifically, it was conducted in collaboration with members of the project’s Community Reference Group, composed of representatives from the Aboriginal Communities in the North Coast of New South Wales, and with the Aboriginal Maternal and Infant Health Service team at Ballina. Additionally, the research was undertaken in collaboration with staff at the University Centre for Rural Health – North Coast, University of Sydney, where I was employed for the duration of the research. The relevant staff are named co-authors on the published papers, or have been acknowledged in those papers.
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<th>Description</th>
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<tbody>
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<td>ACCHS</td>
<td>Aboriginal Community Controlled Health Service</td>
</tr>
<tr>
<td>ACT</td>
<td>Australian Capital Territory</td>
</tr>
<tr>
<td>AHEO</td>
<td>Aboriginal health education officer</td>
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<tr>
<td>AHW</td>
<td>Aboriginal health worker</td>
</tr>
<tr>
<td>AMIHS</td>
<td>Aboriginal Maternal Infant Health Service</td>
</tr>
<tr>
<td>AMS</td>
<td>Aboriginal Medical Service</td>
</tr>
<tr>
<td>CI</td>
<td>Confidence interval</td>
</tr>
<tr>
<td>CINAHL</td>
<td>Cumulative Index to Nursing and Allied Health Literature</td>
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<tr>
<td>CRG</td>
<td>Community reference group</td>
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<tr>
<td>DALY</td>
<td>Disability adjusted life year</td>
</tr>
<tr>
<td>DHF</td>
<td>Department of Health and Family</td>
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<tr>
<td>IUGR</td>
<td>Intra-uterine growth retardation</td>
</tr>
<tr>
<td>LBW</td>
<td>Low birth weight</td>
</tr>
<tr>
<td>NACCHO</td>
<td>National Aboriginal Community Controlled Health Organisation</td>
</tr>
<tr>
<td>NATSIHS</td>
<td>National Aboriginal and Torres Strait Islander Health Survey</td>
</tr>
<tr>
<td>NATSISS</td>
<td>National Aboriginal and Torres Strait Islander Social Survey</td>
</tr>
<tr>
<td>NCAHS</td>
<td>North Coast Area Health Service</td>
</tr>
<tr>
<td>NHMRC</td>
<td>National Health and Medical Research Council</td>
</tr>
<tr>
<td>NPDC</td>
<td>National perinatal data collection</td>
</tr>
<tr>
<td>NRT</td>
<td>Nicotine replacement therapy</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
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<tr>
<td>NT</td>
<td>Northern Territory</td>
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<tr>
<td>OR</td>
<td>Odds ratio</td>
</tr>
<tr>
<td>RDH</td>
<td>Royal Darwin Hospital</td>
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<tr>
<td>SIDS</td>
<td>Sudden infant death syndrome</td>
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</table>
List of papers included in this thesis


Paper Five: Passey ME, Sanson-Fisher RW. Antenatal smoking cessation support reported by pregnant Aboriginal and Torres Strait Islander women. Unpublished paper – currently under editorial review


Other reports and presentations related to this thesis are listed in Appendix 2.
I warrant that I have obtained permission from the copyright owners to use my own published work in which copyright is held by another party (Appendix 1.2.2).
Synopsis

This thesis by publication is composed of an introduction, seven papers and a final chapter with conclusions. All papers relate to developing an understanding of the factors contributing to the high prevalence of smoking among pregnant Aboriginal and Torres Strait Islander women, or to approaches to supporting women to quit smoking. At the time of submission of this thesis, six of the seven papers have been published or accepted for publication in peer-reviewed journals, and the other paper is under review.

The Introduction provides an overview of Aboriginal health, situating it within an historic context and a social determinants framework. It discusses the contribution of tobacco smoking to poor health outcomes, and the factors contributing to the high prevalence of smoking among Aboriginal and Torres Strait Islander peoples. This chapter then discusses antenatal smoking in more detail, including the associated harms and the opportunities that pregnancy provides for addressing smoking. Finally, this chapter discusses the approach taken in the research for this thesis, including addressing the criteria for research with Aboriginal and Torres Strait Islander peoples.

Paper One, “It’s almost expected”: rural Australian Aboriginal women’s reflections on smoking initiation and maintenance: a qualitative study, is a qualitative study in northern New South Wales (NSW), Australia, involving interviews with 22 Aboriginal women, and focus groups with 14 Aboriginal women and service providers. The paper reports their perceptions of the factors contributing to smoking initiation among Aboriginal girls. The findings locate the initiation of smoking within the broader social context of smoking within Aboriginal communities, which is in turn influenced by historical, cultural and contemporary societal factors, including discrimination and marginalisation. Young girls are influenced by their exposure to tobacco smoking within their extended families and initiate smoking to attain status and to assert membership within their social groups. While parents may dislike their children smoking, they feel disempowered and unable to prevent it. Perceptions of limited life
opportunities result in a focus on pleasure seeking in the present, and smoking is one component of this. The paper provides information in which to situate an understanding of the factors contributing to the high prevalence of smoking among rural Aboriginal women of reproductive age, and highlights the importance of addressing these factors in strategies to reduce smoking initiation. This paper has been published as an open access article in \textit{BMC Women’s Health}.

\textbf{Paper Two}, \textit{Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions}, reports the results of a survey with pregnant Aboriginal and Torres Strait Islander women in NSW and the Northern Territory (NT), Australia, exploring their self-reported behaviour related to smoking tobacco during pregnancy, and the factors associated with different patterns of use. Slightly less than half the women reported currently smoking, and among these, the majority had reduced the amount they smoked, while one-fifth of those smoking at the beginning of their pregnancies reported quitting. Poor knowledge of smoking-related risks, stressful life circumstances and indicators of social disadvantage were associated with continuing to smoke. The paper concludes that improving women’s knowledge will be helpful, but insufficient to reduce antenatal smoking unless other social and environmental stressors are also addressed. This paper has been published in \textit{Drug and Alcohol Review}.

\textbf{Paper Three}, \textit{Tobacco, alcohol and cannabis use during pregnancy: clustering of risks}, reports additional findings from the survey with pregnant Aboriginal and Torres Strait Islander women in NSW and the NT, exploring the use of alcohol and cannabis and the relationship between use of these substances and tobacco. The paper confirms high rates of reported substance use (tobacco 46%, alcohol 21% and cannabis 15%), with marked clustering of use of these substances among a sub-set of vulnerable and disadvantaged women. The paper highlights the need to consider use of other substances and the social realities of women’s lives when addressing tobacco smoking in pregnancy. This paper has been accepted for publication in \textit{Drug and Alcohol}
Dependence as an open access article, and is currently available as an early view article online.

**Paper Four**, *Knowledge, attitudes and other factors associated with assessment of tobacco smoking among pregnant Aboriginal women by health care providers: a cross-sectional survey*, provides results from a survey of antenatal care providers who provide care to Aboriginal and Torres Strait Islander women in NSW and the NT. The majority of respondents reported routinely assessing the smoking status of all their pregnant clients, and had good knowledge of the risks of smoking during pregnancy. However, their knowledge of smoking cessation was poor, and those with poorer knowledge were less likely to assess women’s smoking status routinely. The paper recommends further training in smoking cessation for these providers, including training in effective counselling, in order to improve their confidence and skills in this area. The paper has been published as an open access article in *BMC Public Health*.

**Paper Five**, *Antenatal smoking cessation support reported by pregnant Aboriginal and Torres Strait Islander women*, is a short paper reporting further information from the survey with pregnant Aboriginal and Torres Strait Islander women in NSW and the NT. This paper focuses on the women’s reports of the care they received in relation to smoking cessation, with 90% of women reporting being assessed for smoking. Among smokers, 81% reported being advised to quit, and 62% reported offers of assistance to do so. This paper provides additional evidence for the need for additional training for antenatal providers to improve their smoking cessation support and its effectiveness. It also argues for improved reporting in trials of antenatal smoking, with the need for more detail of the intervention provided, in order to facilitate integration into practice. The paper has not been published but has been submitted to a peer-reviewed journal.

**Paper Six**, *Supporting pregnant Aboriginal and Torres Strait Islander women to quit smoking: views of antenatal care providers and pregnant Indigenous women*, draws on data from the surveys with both the pregnant women and their antenatal care providers in NSW and the NT. The paper presents results on the views of women who
smoke, ex-smokers and antenatal providers regarding the helpfulness of a list of possible strategies for supporting pregnant women to quit smoking. In general, the smokers were least positive about the strategies and the providers most positive, and there were both similarities and differences in the order in which the strategies were rated. All agreed that support for the family to help others quit, and advice from all health care providers were likely to be helpful. However, ex-smokers and current smokers rated rewards for cessation more highly than the providers did. The study provides insight into the approaches likely to be acceptable to women and to providers and therefore have potential for routine implementation. The paper has been accepted for publication as an open access article in *Maternal and Child Health Journal* and is currently available as an early view article online.

**Paper Seven**, *How will we close the gap in smoking rates for pregnant Indigenous women?* presents the results of a systematic review of smoking cessation interventions for pregnant Indigenous women. The review was able to identify only two relevant studies, with neither trial reporting an effect of the intervention. The paper discusses the implications of this and makes recommendations for approaches that could be included in future trials. The paper has been published in the *Medical Journal of Australia* as an open access article. An additional table, not published with the article, is included as an appendix (Appendix 6) to this thesis.

The **final chapter**, *Conclusions, lessons learnt and next steps*, discusses the findings from these papers under three conceptual areas: the social and structural drivers of smoking; the role of individual characteristics; and support from antenatal providers. For each area it identifies the implications of reducing maternal smoking and suggests areas where future research is required. It argues for more intervention research in this field and discusses the challenges inherent in achieving this.
INTRODUCTION

Smoking during pregnancy and the health of Aboriginal and Torres Strait Islander Australians
Aboriginal and Torres Strait Islander Australians – Australia’s First Peoples

Aboriginal and Torres Strait Islander peoples are the Indigenous inhabitants of Australia – the nation’s First Peoples. They are thought to have been resident on the Australian continent for over 60,000 years. In the 2011 Australian census, 548,370 people identified as being Aboriginal or Torres Strait Islander, with 90% of these identifying as Aboriginal, six percent as Torres Strait Islander and the remainder as both Aboriginal and Torres Strait Islander. Aboriginal and Torres Strait Islander peoples make up just 2.5% of the Australian population, ranging from 0.7% in Victoria to 27% in the Northern Territory (NT). Overall, one-third of the Aboriginal and Torres Strait Islander population live in capital cities, with considerable variation between states and territories. While only 19.6% of Aboriginal and Torres Strait Islander peoples in the NT reside in Darwin, 51.3% of those in South Australia live in Adelaide, and 47.4% of Aboriginal and Torres Strait Islanders living in Victoria live in Melbourne.

The age distribution is younger than that of the rest of the Australian population, with a median age of just 21 years, compared with 37 years for the non-Indigenous population, and 36% of the Aboriginal and Torres Strait Islander population being under 15 years of age.

While these figures provide a broad picture of the structure of the Aboriginal and Torres Strait Islander population, it is important to recognise that Aboriginal peoples and Torres Strait Islanders have distinct and different cultures. Traditionally, Aboriginal peoples lived on mainland Australia and Tasmania, while Torres Strait Islanders, who are ethnically Melanesian, lived on the islands of the Torres Strait and Cape York Peninsula. However, in recent times, the distinctions between Aboriginal peoples and Torres Strait Islanders have become less clear, with movement of people for economic and other reasons, and Torres Strait Islanders now living in every state and territory. Traditionally, there was enormous diversity in terms of language, culture and lifestyles across Aboriginal and Torres Strait Islander communities, and they have also had varied experiences in relation to colonisation by Europeans.
The health of Aboriginal and Torres Strait Islander Australians – an overview

The meaning of “health”

For Australia’s First Peoples, “health” is not just the absence of disease for an individual, but is a broader concept, incorporating notions of family, community and spiritual wellbeing, with links to country and culture being integral to good health. In developing the National Aboriginal Health Strategy in 1989, the Working Party developed a definition of health which continues to be used in relation to Aboriginal health:

“Not just the physical well-being of the individual but the social, emotional and cultural well-being of the whole community. This is a whole of life view and it includes the cyclical concepts of life-death-life.” (Preface to the National Aboriginal Health Strategy Working Party, 1989)³.

This holistic concept of health therefore implies more than just a consideration of mortality rates or access to health services; it requires an understanding of the historical and social factors impacting on people’s wellbeing, with consideration of issues such as self-determination, control over one’s environment, access to country and cultural integrity³. The importance of using a broader approach to considerations of Aboriginal and Torres Strait Islander health was articulated by Lowitja O’Donoghue in 2004:

“When considering health, you need a model that has a focus on structural inequities, not just a focus on personal stories of misfortune. Also you need a model that acknowledges a history of oppression and dispossession, and a history of systematic racism.” (Lowitja O’Donoghue, 2004, cited in⁵)

A brief history

European colonisation and the subsequent experience of dispossession and marginalisation have had a devastating impact on the health and wellbeing of
Aboriginal and Torres Strait Islander peoples\(^6\). Prior to colonisation, Aboriginal peoples lived in hunter-gatherer societies, with several hundred language and culture groups, each with well-developed social structures and customary law. The connection to land was, and is, of paramount importance to Aboriginal peoples, as the creation stories (Dreamtime) are linked to, and embedded in, the landscape, and the traditional owners have responsibility for maintaining the wellbeing of their country\(^7\). The connection to country is described as a metaphysical connection between land, body and spirit, with weakness in one element resulting in weakness in the others\(^7\).

Following the arrival of the First Fleet in Sydney in 1788, Europeans gradually expanded across the entire Australian continent, resulting in dispossession of Aboriginal peoples from their traditional lands, with consequent loss of hunting grounds, food sources and cultural connection to the land\(^8,9\). With no treaties between the Europeans and the traditional owners, this invasion was often violent, involving multiple massacres and deliberate poisonings\(^8,9\). European settlement also resulted in the introduction of new infectious diseases, to which the Aboriginal and Torres Strait Islander peoples had no resistance. These diseases included smallpox, tuberculosis, influenza, venereal disease, measles and pertussis\(^6\). These infections caused epidemics of illness among Aboriginal and Torres Strait Islander peoples, with consequent depopulation and massive social disruption\(^6\).

Over the ensuing centuries, under various government protection acts, many people were forcibly moved to distant reserves and missions where conditions were often very poor, creating dependence for shelter, food, clothing and other goods\(^8,10\). Protection Acts regulated and controlled Aboriginal peoples’ lives in every detail, preventing them from owning property, and restricting their employment and work conditions, including their pay\(^8,11\). Additionally, mixed-race children were frequently taken from their families and raised in church-run missions or government institutions\(^8,10,12\). Continuing high rates of incarceration, particularly among men, combined with removal of children and loss of traditional lands and lifestyles, has resulted in loss of social cohesion, breakdown of families, loss of parenting skills, loss of autonomy and increased dependency, continuing over generations\(^9,10,12\).
In the 1950s and 1960s there was a growing protest movement among both Indigenous and non-Indigenous Australians at the discriminatory policies and appalling living conditions of many Aboriginal peoples. In 1967 a national referendum on a constitutional amendment was overwhelmingly carried, giving the Commonwealth Government the power to make laws to benefit Aboriginal and Torres Strait Islander peoples and for Aboriginal and Torres Strait Islander peoples to be counted in the national census. Prior to this, legislation related to Aboriginal and Torres Strait Islander peoples was made by the states, with very variable but limited rights.

The constitutional change had both legislative and symbolic meaning, encouraging the recognition of the moral and political rights of Aboriginal and Torres Strait Islander peoples and their right to self-determination. Since the referendum, activism among Aboriginal and Torres Strait Islander Australians, as well as non-Indigenous Australians, has ensured continued improvements and recognition of Aboriginal rights, with enactment of legislation related to land rights and cultural heritage, and policies to address disparities in health and wellbeing of Aboriginal and Torres Strait Islander peoples, relative to the non-Indigenous population.

During the 1970s legislation was passed increasing Aboriginal land rights, and regional Land Councils were established. The Whitlam Government also introduced a number of other policies intended to be positively discriminatory, including schemes to enable Aboriginal people to obtain housing, financial loans, and tertiary education allowances. In 1992 the High Court of Australia made the historic Mabo judgement, recognising native title in Australia and rejecting the doctrine of terra nullius. Following this decision, the Keating Government enacted the Native Title Act in 1993, establishing a framework for recognition and protection of native title, and establishing the National Native Title Tribunal to determine and register native title claims.

Despite a picture of cumulative trauma, grief and loss, Aboriginal and Torres Strait Islander peoples have demonstrated remarkable survival and resilience, driving significant changes in society. Indigenous leaders have established numerous
community controlled organisations across the country, including Land Councils and Community Controlled Health Organisations. The first Aboriginal Community Controlled Health Service (ACCHS), the Redfern Aboriginal Medical Service, was established in 1971. Since that time, over 150 ACCHS have been established in all states and territories, providing culturally appropriate health services for local populations. The National Aboriginal Community Controlled Health Organisation (NACCHO) is the national peak body for Indigenous Community Controlled Health Services, with affiliates in each state and territory providing support to their member services, advocating for Indigenous communities and contributing to national policy\textsuperscript{16}.

In 2007, NACCHO and Oxfam launched the “Close the Gap” campaign, highlighting the enormous gap in health and wellbeing between Aboriginal and Torres Strait Islander Australians and non-Indigenous Australians and calling for an urgent response\textsuperscript{17}. This was followed by the National Apology to the Stolen Generations, made by Prime Minister Kevin Rudd in the National Parliament in February 2008, an event of enormous significance and symbolism for all Australians. Since that time, state and federal governments have committed to closing the gap in health and wellbeing, with significant investment, regular reporting to Parliament on progress, and numerous policies and strategies to achieve this. The six key targets forming the Closing the Gap objective are:

1. Close the life expectancy gap within a generation
2. Halve the gap in mortality rates for Indigenous children under five within a decade
3. Ensure access to early childhood education for all Indigenous four-year-olds in remote communities within five years
4. Halve the gap in reading, writing and numeracy achievements for children within a decade
5. Halve the gap for Indigenous students in year 12 attainment or equivalent attainment rates by 2020
6. Halve the gap in employment outcomes between Indigenous and non-Indigenous Australians within a decade\textsuperscript{18}.
Social determinants and Indigenous health today

The Aboriginal definition of health described above is consistent with the social
determinants of health framework, a human-rights-based approach which links
inequities in health to the social, political, economic and historical circumstances of
people's lives and inequities in distribution of power and resources. Several models
have been developed which postulate the mechanisms by which these external social
factors determine individuals' health. While there are differences in emphasis
between the various models, they all describe pathways that link distal, macro-level
factors, through intermediate or proximate variables, to individual physiological
mechanisms and health outcomes. In a model developed by Turrell and Mathers,
the macro-level factors include government policies and global forces which then
impact on social determinants, such as education, occupation, employment, income
and housing. Intermediate factors include psychosocial factors (e.g. self-esteem,
coping, social support, stress, networks, control, expectations and depression), health
behaviours (e.g. substance use, diet, physical activity and use of preventive health
care) and factors affecting use of the health care system (such as access, affordability
and availability). These intermediate factors influence each other and also mediate
changes in biological and physiological systems, resulting in inequalities in health
outcomes. The model also identifies the influence of cultural factors on both macro-
level and intermediate level factors. Government policy is framed and developed
within societal cultural contexts, and is therefore influenced by the prevailing values,
beliefs, norms and meanings within the society. Individuals live in differing socio-
cultural contexts, within workplace, family and school environments, which also
influence our psychological and social wellbeing, health-related behaviours and
physiology.

In a detailed analysis of the social determinants of Indigenous health, Anderson argues
that, in addition to factors such as socio-economic status, employment, education and
housing, which are universally important determinants of health, a number of
additional factors are particularly relevant to Indigenous Australians. These include
cultural difference and racism which are experienced disproportionately by Indigenous
Australians$^{23,24}$, Indigenous social connectedness$^{23,25}$, connection to country$^7$ and a recognition of the impact of history on health$^6$.

Given the importance of social factors in determining health outcomes, an understanding of the current status of Aboriginal and Torres Strait Islander peoples with regard to social indicators is important in understanding the context of health status and tobacco use. In general, Indigenous Australians continue to be disadvantaged relative to other Australians, on numerous social indicators$^{26}$. This disadvantage starts at a young age, with only three-quarters of Indigenous children meeting national minimum standards for reading and numeracy in 2009, compared with about 95% of non-Indigenous children. Similarly, school retention rates are lower, with only 47% of Indigenous students completing year 12, compared with 79% of non-Indigenous students, although the Indigenous rate has improved from 29% in 1996$^{26}$. Among Indigenous adults, there is also evidence that the situation is improving, with 30% of 25 to 34 year olds having completed year 12, gradually declining to only 7% of those over 55 years of age$^{26}$.

Labour force participation is considerably lower among Aboriginal and Torres Strait Islander peoples than among non-Indigenous Australians. In 2008, while 79% of non-Indigenous Australians were in the labour force (including people who were unemployed), only 65% of Indigenous Australians were in the labour force, with 10% of these people working in Community Development Employment Projects, a form of supported employment on very low wages$^{26}$. Unemployment was higher among Indigenous Australians across all age groups, with the highest rates and largest gap among those aged 15 to 24 years, and employment higher among males than females$^{26}$. Additionally, even when employed, Indigenous Australians are more likely to be employed in non-skilled jobs, with 25% of those with jobs employed as labourers, compared with 10% of non-Indigenous Australians$^{26}$. Consistent with this level of employment, 49% of Indigenous households are in the lowest income quintile, and fewer than 5% are in the highest income quintile$^{26}$.
Indigenous home ownership is low, with 32% of households owning or purchasing their own home in 2008, rising from 26% in 1994, and with higher rates in non-remote areas\textsuperscript{26}. A further 33% rented houses from private owners, while 32% lived in some form of social housing. This compares with 66% of the non-Indigenous households living in housing they owned or were purchasing, and 29% renting, with the majority of this being private rental\textsuperscript{26}. Indigenous households are more frequently overcrowded, with 25% of Indigenous Australians living in overcrowded conditions in 2008, compared with just 4% of non-Indigenous Australians. Consistent with this, a larger proportion of Indigenous households were multiple family households compared with non-Indigenous households (6.7% versus 1.4% respectively)\textsuperscript{26}. Additionally, Indigenous households were more commonly one-parent families with dependent children than non-Indigenous households (19% compared with 6% respectively)\textsuperscript{26}.

**Health indicators for Aboriginal and Torres Strait Islander peoples**

Aboriginal and Torres Strait Islander peoples experience a greater burden of poor health than the rest of the Australian population, with higher morbidity and mortality, shorter life expectancy and greater perinatal and infant mortality\textsuperscript{26}. For the period 2005 to 2007, life expectancy at birth was 67.2 years for Aboriginal and Torres Strait Islander males and 72.9 years for females, compared with 78.7 years and 82.6 years respectively for the non-Indigenous Australian population\textsuperscript{26}. There was considerable variation by state and territory, with life expectancy highest for both male and female Aboriginal and Torres Strait Islanders in New South Wales (NSW) and lowest in the NT\textsuperscript{26}.

Age-standardised death rates are significantly higher for Aboriginal and Torres Strait Islander peoples than for non-Indigenous Australians. For the period 2004 to 2008, the age-standardised death rate for Aboriginal and Torres Strait Islander males was 1.9 times the rate for non-Indigenous males (1,381 per 100,000 population compared with 712 per 100,000). For females, the respective rates were 1,021 versus 521 per 100,000 population, with a rate ratio of 2.0\textsuperscript{26}. Age-specific death rates were higher for Aboriginal and Torres Strait Islander males and females in every age group, with the
discrepancy greatest for both males and females aged 35 to 44 years. Two-thirds of deaths among Aboriginal and Torres Strait Islander people occurred before age 65 years, compared with only 20% of deaths among the non-Indigenous population. Infant mortality (deaths in the first year of life among live births) was twice the rate of the non-Indigenous population for female babies, and for male Aboriginal and Torres Strait Islander babies, it was 2.2 times the non-Indigenous rate. Mortality rates for both male and female Aboriginal and Torres Strait Islander adults have fallen significantly since 1991, and the Indigenous infant mortality rate is declining faster than the non-Indigenous rate.

The 2008 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) assessed positive wellbeing in addition to psychological distress and other stressors. The majority of Aboriginal and Torres Strait Islander adults reported feeling happy (72%), calm and peaceful (59%) and full of life (57%) in the previous four weeks, with rates higher in men than women, and in remote than non-remote areas. However, 31% of Indigenous adults have high/very high levels of psychological distress, more than double the rate for non-Indigenous adults, with rates higher among women than men. Consistent with this, 77% of Indigenous adults reported a stressful life event in the previous 12 months, with the most common being death of a family member or close friend (39%), serious illness or disability (31%) and being unable to get a job (22%). Twenty-seven percent of adults also reported experiencing discrimination in the previous 12 months.

Self-assessed health status was collected in the 2004-2005 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS), with 43% of Indigenous adults reporting very good or excellent health, 35% reporting good health, and 22% reporting their health as fair or poor. After adjusting for age structure, Indigenous Australians were twice as likely to report fair or poor health status compared with non-Indigenous Australians. The rate of reported fair or poor health was higher for females than males, and was higher in non-remote than remote areas.
Major diseases contributing to poor health outcomes

In 2005-2007, approximately 80% of the *mortality gap* between Aboriginal and Torres Strait Islander and non-Indigenous Australians could be attributed to chronic diseases, with the greatest contributor for both males and females being circulatory diseases, followed by endocrine, nutritional and metabolic diseases, diseases of the respiratory system and neoplasms\(^26\). A study of the burden of disease for Indigenous Australians, combining the impact of mortality and morbidity into disability-adjusted life years (DALYs), found that non-communicable diseases explained 70% of the *gap in disease burden* between Indigenous and non-Indigenous Australians\(^28\). Cardiovascular disease accounted for 23% of the health gap, followed by injury (15%), diabetes (12%), mental disorders (12%) and chronic respiratory disease (9%)\(^28\). The gap in disease burden was largely driven by differences in mortality between Indigenous and non-Indigenous Australians, due to a higher case fatality rate, particularly for cancer, injuries and cardiovascular disease, rather than by differences in disability caused by disease\(^28\). Indigenous people living in remote areas bore the highest burden of disease\(^28\).

Birth outcomes

In 2009, there were 15,800 births in Australia where at least one of the parents identified as Aboriginal or Torres Strait Islander\(^26\). In 2010, 11,494 Indigenous women gave birth to 11,640 babies in Australia\(^29\). Indigenous women giving birth are generally younger than non-Indigenous women, with 19.7% of Aboriginal and Torres Strait Islander women giving birth being teenagers, compared with only 3.2% of non-Indigenous mothers\(^29\). Premature births are defined as those less than 37 weeks gestation, and low birth weight is defined as less than 2,500 grams\(^29\). More babies born to Aboriginal and Torres Strait Islander mothers were born prematurely (13.5% versus 8.0%) or of low birth weight (12.0% versus 6.0% of live born babies) than those born to non-Indigenous mothers\(^29\). Perinatal death rates were also higher for babies born to Indigenous mothers – 17.1 versus 8.8 per 1,000 live births respectively\(^29\). Premature birth and intrauterine growth retardation were identified as contributing factors in 33% of perinatal deaths among Aboriginal and Torres Strait Islander babies for the period 2004 to 2008, with other contributing factors being birth trauma, disorders
specific to the newborn, and complications with the placenta, cord or membranes (18%)26.

**Infant and child health**

The most common causes of death for Aboriginal and Torres Strait Islander infants were conditions originating in the perinatal period (including birth trauma, poor foetal growth, pregnancy complications, and respiratory and cardiovascular disorders specific to the perinatal period), which accounted for 46% of infant deaths, followed by ill-defined conditions (19%), including sudden infant death syndrome (SIDS), which caused 7% of infant deaths26. Indigenous babies have four times the relative risk of dying from SIDS than non-Indigenous babies30.

Respiratory diseases, including otitis media and pneumonia, are more common among Aboriginal and Torres Strait Islander children than non-Indigenous children, with the hospitalisation rate for pneumonia being three times higher, and death from respiratory diseases being four times higher, among Indigenous than non-Indigenous children26. Other diseases found more commonly in Indigenous than non-Indigenous children include trachoma and rheumatic fever26.

**The role of tobacco in Aboriginal and Torres Strait Islander health**

**Prevalence of tobacco use**

In 2008, 47.7% of Aboriginal and Torres Strait Islander people aged 18 years or over were estimated to be current daily smokers, with an additional 2.2% currently smoking less often than daily31. Just over one-fifth (21.4%) were ex-smokers, and only 28.8% had never smoked31. The prevalence of smoking varied by location, with the highest rate of current daily smokers in the NT (50.9%) and the lowest rate in the Australian Capital Territory (ACT) (36.4%)31, and with higher rates in very remote areas (51%) than major cities (46%)31. Even higher rates have been reported from individual studies in remote communities32-33. For males, the highest rates occurred in those aged 25 to 34 and 35 to 44 years, while for females, the highest rates occurred in those aged 18 to 24 and 25 to 34 years31. The rates of smoking are substantially higher in all
age and gender groups for Indigenous than non-Indigenous Australians, with age-standardised rates of daily smoking being 2.4 times higher than for non-Indigenous Australians, and rates of never having smoked being considerably lower\textsuperscript{31}.

Despite these high prevalence figures there is room for optimism. A trend analysis of data from four national surveys of Aboriginal and Torres Strait Islander peoples from 1994, 2002, 2004 and 2008 demonstrated a significant decline in the prevalence of current daily smokers for both males and females\textsuperscript{34}. For males, the prevalence fell from 58.5% in 1994 to 52.6% in 2008, decreasing by 0.4% per year, with the same decline in remote and non-remote men. For females, smoking also declined in non-remote areas, falling by 0.5% per year, but increased for remote women by 0.4% per year. Between 2002 and 2008 there was also an increase in ever-smokers who reported quitting, rising by 1% per year in both men and women, and in both remote and non-remote areas\textsuperscript{34}. A parallel study with the same datasets found a decline in the proportion of Indigenous people smoking more than 20 cigarettes per day from 17.3% in 1994 to 9.4% in 2008, a 45% relative reduction\textsuperscript{35}.

**Exposure to second-hand smoke**

Aboriginal and Torres Strait Islander children are more frequently exposed to second-hand smoke than non-Indigenous children, with 63% of Indigenous children aged less than 15 years living in a household with a regular smoker in 2008, compared with 32% of non-Indigenous children\textsuperscript{36}. Indigenous children are also more likely to live with a regular smoker who smokes inside the home, with 21% of children aged less than 15 years and 16% of children aged three or less living in a household with indoor smokers\textsuperscript{36}. These figures have declined from 29% and 24% respectively in 2004-2005, but are still considerably higher than for non-Indigenous children, of whom 7% of children under 15 years live with an indoor smoker\textsuperscript{36}.

**Contribution of tobacco to poor health outcomes for Aboriginal and Torres Strait Islander peoples**

Tobacco is an important contributor to the gap in health outcomes between Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians. Tobacco smoking is
recognised as a cause of, or a major risk factor for, many of the diseases which contribute to the excess mortality and disease burden borne by Aboriginal and Torres Strait Islander peoples, including cardiovascular diseases, type 2 diabetes, chronic kidney disease, chronic obstructive pulmonary disease, pneumonia and many cancers\textsuperscript{37,38}. Diabetes can also lead to cardiovascular disease, chronic kidney disease and retinopathy, with these complications more common among smokers, further exacerbating the burden from smoking\textsuperscript{38,39}.

**Burden of disease from tobacco smoking**

The 2004 Indigenous burden of disease study described above assessed the contribution of eleven risk factors to Indigenous poor health, and found that 12.1% of the total disease burden was attributable to tobacco, the greatest contribution of any of the risk factors assessed\textsuperscript{28}. Tobacco was responsible for 20% of all deaths, with three-quarters of the overall burden of disease due to tobacco accounted for by ischaemic heart disease (37%), chronic obstructive pulmonary disease (21%) and lung cancer (15%)\textsuperscript{28}. The proportion of DALYs due to tobacco among Indigenous Australians was more than six times higher than for non-Indigenous Australians\textsuperscript{28}. A further analysis revealed that tobacco was responsible for 17% of the total gap in health between Indigenous and non-Indigenous Australians\textsuperscript{40}.

**Measures of morbidity from tobacco use**

Other measures of health and wellbeing of Aboriginal and Torres Strait Islander peoples also reveal significant impact from tobacco. Self-assessed health status was collected in the 2008 NATSISS. Among current smokers, 38.5% reported their health as “excellent/very good”, with 25.3% reporting their health as “fair/poor”. This compares with never-smokers, of whom 52.6% reported “excellent/very good” health, and only 15.8% reported “fair/poor” health\textsuperscript{31}. Aboriginal and Torres Strait Islander peoples are also four times more likely to be hospitalised with principal diagnoses related to tobacco use than non-Indigenous Australians (3.3 per 1,000 population compared with 0.8 per 1,000 population)\textsuperscript{31}.
**Impact on health from second-hand smoke**

Tobacco smoke does not only cause harm to the individual smoker, but also has significant health impacts on people exposed to second-hand smoke\(^1\). Children exposed to second-hand smoke have slower lung growth and are at increased risk of SIDS, respiratory infections, otitis media, asthma and premature death than children not exposed\(^1\). Children exposed to smoking at home are also more likely to become smokers themselves\(^2\). The harms from second-hand smoke exposure are not confined to children, with adults at increased risk of premature death, cardiovascular disease and lung cancer\(^1\). Exposure of pregnant women to second-hand smoke also reduces infant birth weight and increases the risk of low birth weight\(^3,4\).

A study with pregnant Indigenous women in Perth confirmed an association between antenatal exposure to second-hand smoke and low birth weight and/or preterm birth\(^5\). Another study from Western Australia demonstrated three-fold odds of developing otitis media among Aboriginal and Torres Strait Islander children exposed to second-hand smoke, compared with Indigenous children not exposed\(^6\).

**Indirect impacts**

Tobacco smoking may also have an indirect impact on health through its impact on individual and family finances and stress levels. Tobacco smoking can cause significant hardship for individuals, families and the community due to purchases of tobacco taking priority over essentials such as food, with adverse consequences for nutrition and wellbeing, especially among children\(^7,8\). The report from the National Aboriginal and Torres Strait Islander Tobacco Control Project undertaken by NACCHO noted that tobacco use increases stress for individuals and families and causes serious financial and social problems\(^7\). They reported that crime and violence were related to securing tobacco, including pressuring relatives and friends to share tobacco, thus undermining family and community structures\(^7\). Similar issues have been reported among New Zealand Maori\(^9\).
Factors contributing to the high prevalence of smoking

History of tobacco use among Aboriginal and Torres Strait Islander peoples

Prior to introduction of tobacco for smoking, Aboriginal peoples traditionally chewed a number of different types of nicotine-containing “bush tobacco”, the most powerful of which was “pituri”, with a nicotine content of up to 8%, made from the leaves of *Duboisia hopwoodii*. The leaves of these plants were dried, mixed with ash to release the nicotine, and chewed. These substances, especially pituri, were highly valued and widely traded, although they may not have been used in all parts of the country. The use of these nicotine-containing substances was restricted by a number of social control mechanisms, including rules around production, distribution and consumption, and had significant social value. It is unlikely that many people outside the areas of production were addicted to nicotine, due to the small amounts available and social controls on usage.

Tobacco smoking was first introduced by Macassan fisherman from Indonesia, who started visiting northern Australia around 1700 to fish for trepang and collect pearls. These fishermen introduced the coastal Aboriginal communities of northern Australia to numerous items, including dugout canoes, shovel nose spears, alcohol, betel nut, tobacco and pipes, which were apparently offered as a tribute to facilitate good relations and to recognise the land rights of the local people. The Macassan clay pipe and tobacco were incorporated into local Aboriginal ceremonial life, and are still in use in some parts of Arnhem land today. Tobacco and bamboo pipes were also introduced into the Torres Strait and Cape York, although the origin of this tobacco is not clear, and the method of smoking was different, as the smoke was inhaled very deeply. Like pituri, tobacco was a valued trade item, but the consumption of tobacco would have been limited by the seasonality of the Macassan visits, and it is unlikely that many people were addicted to nicotine in this form beyond the immediate coastal strip. Brady argues that, “The manner in which pituri and tobacco had been traded, and the fact that a wide variety of goods were obtained in exchange for these drugs,
provided the socio-cultural basis for the way in which imported tobacco was obtained, exchanged and traded with Europeans\textsuperscript{50}.

With the arrival of the British, tobacco gradually became more widely available. Prior to 1788, it is unlikely that Aboriginal peoples in south-eastern Australia used tobacco\textsuperscript{53}. The Europeans introduced tobacco and pipes, frequently offering tobacco in initial encounters with local people as a conciliatory offer and a means of establishing relationships\textsuperscript{50}. Tobacco was used by the Europeans as a means of payment for goods and labour, including by missionaries, explorers, cattle station managers, miners, anthropologists and others\textsuperscript{50}. With European expansion across the continent, tobacco became widely used by the Indigenous population, with rapid development of addiction\textsuperscript{50,51}. Indigenous people voluntarily travelled long distances, enduring considerable hardship, to obtain tobacco, with some preferring payment in tobacco and blankets to other kinds of payment, and tobacco was commonly part of the payment of stockmen, together with food, clothing and boots\textsuperscript{50,51,53}. Inclusion of tobacco in rations and payment continued in some industries until the 1960s\textsuperscript{51,53}. There is evidence that Indigenous people actively sought tobacco and were willing to exchange labour and goods to obtain it, but there is also clear evidence that tobacco and addiction were deliberately used by Europeans to manipulate the Indigenous population, create dependency, and attempt to move Indigenous people away from their traditional lands and way of life, to a settled and European way of living\textsuperscript{50,51,53}.

**Socio-economic factors**

Socio-economic factors are recognised as significant drivers of smoking behaviour nationally and internationally, with smoking prevalence inversely associated with socio-economic status, using a range of measures including education, income, labour force status, household composition, geographic location and other indices of social disadvantage\textsuperscript{54-57}. Relative to non-Indigenous Australians, Aboriginal and Torres Strait Islander peoples are significantly more likely to experience disadvantage in relation to access to education, educational achievement, employment, income, home ownership, housing quality, overcrowding and homelessness\textsuperscript{56}. Additionally, Aboriginal
and Torres Strait Islander Australians are more likely to have been imprisoned or have a family member imprisoned, and are more likely to experience mental illness, with higher rates of suicide, self-harm and psychological distress than other Australians26.

Analysis of data from the 2002 NATSISS confirmed these socio-economic differentials in smoking behaviour among Indigenous Australians across a range of measures. Those with higher income, more education, better employment, not dependent on welfare, not experiencing financial stress, not renting their housing, having access to a motor vehicle, having access to a computer and having access to the internet, were more likely to be non-smokers58. People who had been arrested were 4.5 times less likely, and those who had been incarcerated were 4.0 times less likely, to be non-smokers58. Analysis of data from the 2004-05 NATSIHS further confirmed these socio-economic differentials for Indigenous Australians59. However, comparison of the data from the 2004-2005 NATSIHS with non-Indigenous data from the 2004-2005 National Health Survey found that disparities in the smoking prevalence between Indigenous and non-Indigenous Australians persisted at every socio-economic level, indicating that other factors beyond socio-economic disadvantage also contribute to the high prevalence. Analysis of the NSW perinatal dataset revealed similar findings for antenatal smoking, with a socio-economic gradient in smoking for all age groups except women under 20 years of age, and with Aboriginal women having higher smoking prevalence for every socio-economic and age group60.

**Government policy**

In addition to the introduction of tobacco, and the colonial practices of using tobacco as gifts and as rations, government policies of removing mixed race children from their families appear to have impacted smoking behaviour. Data from the 2002 NATSISS showed that people who had been removed from their natural families were twice as likely to be smokers, after controlling for age, gender and socio-economic status58. Although not possible to prove conclusively, it is likely that the experience of colonisation, with dispossession from country and culture, family dislocation, and
continuing marginalisation and racism have also contributed to the high prevalence of smoking among Aboriginal and Torres Strait Islander peoples\textsuperscript{53,61}.

**Social norms and acceptability**

The high prevalence of smoking, with approximately half the adult population smoking, means that smoking has become “normalised” in Aboriginal and Torres Strait Islander communities, with high levels of acceptability, further contributing to the perpetuation of smoking\textsuperscript{47,53,61}. Normalisation, combined with a culture of reciprocity and sharing, and the historical role of tobacco in trade and social relations, all contribute to tobacco playing a key role in ensuring social cohesion\textsuperscript{47,53}. Tobacco is used to strengthen relationships, and sharing cigarettes and having a “yarn” are important communal practices that serve to bind families and communities\textsuperscript{47,48,53,62}. The importance of smoking in social relationships also acts as a barrier to cessation, as non-smoking may mean exclusion from these social processes, with experiences of isolation and alienation\textsuperscript{47,48,53,62}.

Social norms related to sharing resources also contribute to maintaining smoking status, as people often feel obliged to share cigarettes with friends and family even if their own supplies are low\textsuperscript{47,48}. Pressure to share cigarettes, or money to buy them, can create considerable stress within families and communities, but refusal is not common\textsuperscript{47,48}. A study from three remote NT communities describes the centrality that tobacco has to community life, with participants in this study all being smokers or living with smokers, and reporting that they could not escape the “enormous influence tobacco had on their lives”\textsuperscript{48}. Smoking was a communal activity, with money pooled to purchase tobacco, and whole clans involved in organising access to tobacco for hours or a day. The pervasiveness of tobacco in these communities made cessation very difficult due to the constant visibility of smoking, access to cigarettes, pressure to participate, and the need to be a part of the social processes\textsuperscript{48}. While the situation for Indigenous people living in other settings, particularly rural and urban settings, may be different, similar issues were identified in a national study undertaken by NACCHO\textsuperscript{47}. 
Relatively low levels of consumption of cigarettes among Aboriginal and Torres Strait Islander peoples have been identified in some studies. Low levels of nicotine dependence among Aboriginal and Torres Strait Islander peoples have also been identified. These studies suggest that social norms and habit play a relatively larger role than in populations with greater nicotine dependence.

The presence of smokers in nearly every household enhances access to cigarettes for children and adolescents and ensures their exposure to smoking behaviour and modelling. Several studies have identified extended family influences as an important contributor to smoking initiation, with modelling of smoking behaviour leading children to see smoking as desirable and pleasurable. While parents may not necessarily approve of children starting smoking, there may be an acceptance of smoking once started, with adolescents then joining groups of adults sharing cigarettes.

There is evidence that the presence of a new baby in a household may increase restrictions on indoor smoking among Aboriginal and Torres Strait Islander families. A study in the NT found that despite 31% of households having indoor smokers during a woman’s pregnancy, following the birth the numbers reporting indoor smoking dropped to 12% at one month, increasing to 16% at seven months. In another study in three remote communities in Arnhem Land, 50% of respondents indicated they restricted their smoking in some environments, with women more likely to do so. The main motivators for restricting smoking included having a smoke-free rule at work, having a smoking outside house rule, and concerns about exposing children or sick people. A qualitative study in regional NSW also found that people reported making significant efforts to reduce exposure of babies to second-hand smoke, but this reduced as children got older.

**Knowledge of harms**

Smoking is recognised as harmful by Aboriginal and Torres Strait Islander peoples, but knowledge of specific risks may be limited. The National Aboriginal and Torres Strait Islander Tobacco Control Project found that almost all respondents recognised that...
smoking was harmful to health and could cause a range of diseases including cardiovascular disease, lung cancer and emphysema, but were less aware of other risks such as causing other cancers or that smoking could worsen diabetes. A smaller study with Victorian Aboriginal youth found that most were aware that smoking was harmful, and particularly that it could impact on their sporting performance.

**Stress and coping**

Stress has frequently been cited as a major contributor to the high rates of smoking among Aboriginal and Torres Strait Islander peoples. As described above (see sections on “Health indicators for Aboriginal and Torres Strait Islander peoples” and “Socio-economic factors”), smoking rates are correlated with socio-economic disadvantage and other stressful experiences such as incarceration, which disproportionately impact Indigenous Australians. The types of stressors that have been identified as contributing to smoking among Indigenous Australians include financial and housing problems, the challenges of managing family expectations, family violence, incarceration of family members, drug and alcohol problems in the family, experiences of racism, and frequent deaths in the extended family. The 2008 NATSISS found that 31% of Aboriginal and Torres Strait Islander people aged 15 years and over reported high or very high levels of psychological distress in the four weeks prior to the survey, with the most common types of stressors reported by those with high distress being bad illness/accident (52%), death of a family member or close friend (51%) and alcohol and drug related problems (39%). Those with high or very high levels of distress were more likely to smoke (54%) than those with low/moderate levels of distress (41%). Given this high level of individual, household and communal stress, smoking is used to relieve stress, and cessation is likely to be extremely challenging.

**Alcohol and illicit substances**

There is a complex interaction between use of tobacco, alcohol and cannabis. Alcohol is consumed by a smaller proportion of Aboriginal and Torres Strait Islander peoples than non-Indigenous Australians. However, among those who do drink alcohol,
consumption is more likely to be at harmful levels\textsuperscript{26}. Data from the 2008 NATSISS indicate that 17\% of Indigenous people aged 15 and over reported drinking at levels considered high risk for long-term harm, and 37\% reported high-risk levels of binge drinking\textsuperscript{36}. Those who drank at risky levels for chronic harm were more likely than others to smoke tobacco (63\% compared with 46\%), and to use illicit drugs (37\% versus 22\%)\textsuperscript{36}. Similarly, those who reported risky levels of binge drinking were more likely to smoke tobacco (59\% versus 33\%) and more likely to use illicit drugs (32\% versus 18\%)\textsuperscript{36}.

In 2008, 20\% of Aboriginal and Torres Strait Islander people 15 years or over reported using an illicit substance in the previous 12 months, with the most common substance reported being cannabis (16\%)\textsuperscript{36}. Men were more likely than women to report use of illicit substances, and the rate was higher among people aged 15 to 34 years than those 35 years and over (25\% versus 15\%)\textsuperscript{36}. Among young people who reported use of illicit substances, rates of smoking and binge drinking in the previous two weeks were much higher than among those who had not used illicit substances (69\% versus 36\% for smoking and 61\% versus 33\% for binge drinking)\textsuperscript{36}.

Other research from remote communities in both the NT and Cape York have found much higher rates of cannabis use than those reported in the NATSISS\textsuperscript{77,78}. In one Cape York community, 66\% of males and 31\% of females were current cannabis users, with 97\% of current users also currently smoking tobacco, compared with 59\% of former cannabis users and 69\% of people who had never used cannabis\textsuperscript{77}. In a cohort study in Arnhem Land, 67\% of males and 22\% of females aged 13 to 36 were cannabis users at baseline, with users significantly more likely to also use alcohol and tobacco and sniff petrol\textsuperscript{79}. At follow-up, 43\% of males and 44\% of females who didn’t use cannabis at baseline had commenced use, with tobacco smoking at baseline a significant predictor of uptake\textsuperscript{78}. Cannabis was usually mixed with tobacco and smoked in a bucket bong\textsuperscript{79}. The study concluded that cannabis use helped reinforce tobacco use, and that joint dependence on these substances would create significant health problems for these communities\textsuperscript{79,80}. Cannabis may also be a “gateway” drug leading to tobacco use in these communities, as for some people cannabis use had preceded tobacco use\textsuperscript{81}. 

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Similar concerns have been raised in non-Indigenous populations, with cannabis leading to use of tobacco, and making tobacco cessation more difficult\textsuperscript{82-84}.

**Smoking cessation**

In 2008, 20% of Aboriginal and Torres Strait Islander adults participating in the NATSISS were ex-smokers, an increase from 15% in 2002\textsuperscript{26}. Among current smokers, 62% reported attempting to quit or reduce their smoking in the previous 12 months, with the most common reasons being general health, cost, and encouragement from family and friends\textsuperscript{36}. Other studies assessing the motivators for smoking cessation have found that the main motivators are experience of a significant illness event, wanting to see their grandchildren grow up, observing tobacco-related illness in others, the cost of tobacco, children asking them to, wanting to limit exposure of children to second-hand smoke, wanting to be a good parent and a good role model, and the cost of tobacco\textsuperscript{47,48,85}. The health and wellbeing of family, in particular children, and wanting to be a positive role model, were particularly common themes\textsuperscript{48,85}.

**Tobacco and pregnancy**

**Rates of smoking during pregnancy among Aboriginal and Torres Strait Islander women**

Data from the 2010 National Perinatal Data Collection (NPDC) indicate that 49.3% of Aboriginal and Torres Strait Islander women smoked during pregnancy, compared with 12.1% of non-Indigenous women giving birth. When age-standardised, the Indigenous rate of antenatal smoking was nearly four times that of the non-Indigenous rate\textsuperscript{29}. More detailed information is available for 2008, during which 50.9% of Indigenous women, and 14.9% of non-Indigenous women reported smoking during pregnancy.

There was considerable variation in the antenatal Indigenous smoking rate by location, ranging from 45.6% of women in the NT to 62.5% in South Australia, and from 49.3% in major cities to 56.0% in outer regional areas reporting smoking\textsuperscript{31}. There was a gradual decline in the smoking rate with age, from 53.6% among women aged less than 20, to 47.9% among women older than 40 years, although this decline was not as marked as among non-Indigenous women\textsuperscript{31}. In all regions and age groups the rate of antenatal
smoking among Indigenous women was higher than that for non-Indigenous women\textsuperscript{31}. The 2008 NATSISS collected information on smoking during pregnancy from mothers of Indigenous children aged 0 to 3 years. Among these women, 42\% reported using tobacco (smoking or chewing) during pregnancy, with 24\% reporting less use during pregnancy\textsuperscript{31}. A trend analysis of NPDC data from 2001 to 2008 suggested that the rate of smoking had been fairly constant over this time, although the number of states and territories reporting changed over time\textsuperscript{31}.

Analysis of NSW perinatal data from 1994 to 2007 indicates a steady and significant decline in antenatal smoking among Aboriginal women in that state from 61.4\% in 1994 to 50.2\% in 2007, with half this fall occurring between 2004 and 2007\textsuperscript{60}. State-specific perinatal data reveal similarly high prevalence of antenatal smoking. An analysis of all South Australian singleton births for 1998 and 1999 found a prevalence of antenatal smoking among Indigenous women of 57.8\%, compared with 24.0\% among non-Indigenous women, with no decline with age\textsuperscript{86}. A study using NSW data for 1999-2003 found a prevalence of 57.8\% for Aboriginal women and 16.0\% for non-Indigenous women, with Aboriginal women more likely to be heavy smokers (more than 10 cigarettes per day) and less likely to quit smoking in the second half of pregnancy\textsuperscript{87}. In Queensland in 2005-2006, 54\% of Indigenous women smoked, compared with 19\% of non-Indigenous pregnant women\textsuperscript{88}. Other smaller studies in antenatal settings across Australia have found antenatal smoking rates ranging from 41\% in Townsville to 67\% in Perth, although other studies in Townsville have reported rates of 50\% and 64\%\textsuperscript{72,89-92}.

**Antenatal smoking as a risk factor for poor health**

Smoking is the single most important preventable cause of foetal and perinatal mortality in western countries\textsuperscript{93,94} and causes numerous adverse outcomes for both the infant and the mother\textsuperscript{37,95,96}. For the mother, smoking increases the risk of placental abruption, placenta praevia, premature labour and premature rupture of membranes\textsuperscript{37,95,96}. For the baby, antenatal smoking increases the risk of low birth weight, preterm birth, intra-uterine growth retardation, perinatal death and
SIDS$^{37,95,96}$. Antenatal smoking is associated with a number of adverse outcomes in childhood and later life, for which there is strong, but not conclusive, evidence of causation, including adult obesity$^97$, childhood wheeze and asthma$^98$, and reduced academic achievement and cognitive abilities$^{99,100}$.

Maternal antenatal smoking is also associated with a number of other adverse outcomes for the offspring for which there is suggestive evidence of causation. These include an increased risk of admission to a special care nursery or neonatal intensive care unit$^{101}$, an abnormal lipid profile in adulthood$^{102}$, behavioural problems in childhood, adolescence and young adulthood$^{103-106}$, use of tobacco, alcohol and cannabis in adolescence$^{107}$, and psychotic symptoms in adolescence$^{108}$.

Adverse birth outcomes associated with antenatal smoking have been confirmed in a number of studies with Aboriginal and Torres Strait Islander women. In the West Australian Child Health Survey, tobacco use was associated with a 200g reduction in mean birth weight, but there was no significant difference in the proportion of babies with low birth weight (<2,500g)$^{109}$. In an analysis of South Australian singleton births for 1998 and 1999, Chan et al. assessed the impact of antenatal smoking on rates of preterm birth, low birth weight and being small for gestational age$^{86}$. The study confirmed elevated risks for each of these outcomes from smoking, with a dose-response relationship and higher population attributable risks for Aboriginal than non-Aboriginal births: preterm births 20% versus 11%; low birth weight 35% versus 23%; and small for gestational age 48% versus 21%, for Aboriginal and non-Aboriginal births respectively$^{86}$. A Queensland study of 80,735 singleton births in 2005 to 2006 found a relative risk of 1.37 for preterm birth, and of 4.91 for being low birth weight at term, among babies of Indigenous smokers relative to those of Indigenous non-smokers$^{88}$. Smaller studies have demonstrated a significantly increased risk of small for gestational age$^{91}$, low birth weight$^{110}$ and “poor birth outcomes”, defined as low birth weight and/or preterm birth$^{45}$, among Indigenous smokers relative to non-smokers.
Factors contributing to the high prevalence of antenatal smoking

Against a background of high smoking prevalence among women of reproductive age, a number of pregnancy-specific factors need consideration in addition to the issues raised above. Much of the research discussed in this section has been published since initiation of this doctoral research. There is mixed evidence about women’s knowledge of pregnancy-related smoking risks, with a study in Townsville reporting high levels of knowledge of risks among both smokers and non-smokers, with no significant difference in knowledge between these two groups\textsuperscript{72}. By contrast, a qualitative study in Perth found that women were generally aware that smoking during pregnancy was bad for the baby, but had limited knowledge of specific risks, and while they realised that cessation was ideal, many thought that this was too difficult to achieve and cutting down was an acceptable alternative which would minimise the harms\textsuperscript{62}. A recent synthesis of both peer-reviewed and grey literature related to pregnant Indigenous women’s knowledge and views of antenatal smoking suggests that knowledge of specific risks is poor, and that the harm-focused anti-smoking messages lack salience for these women\textsuperscript{111}.

Stress has been identified as an important barrier to quitting during pregnancy for Aboriginal and Torres Strait Islander women\textsuperscript{62,65,72}. In a study with pregnant Indigenous women in Townsville, levels of daily stress among smokers were significantly higher than for non-smokers\textsuperscript{72}. An earlier study in Townsville explored perceived barriers to quitting, with 57\% of participants identifying smoking for stress relief as a barrier\textsuperscript{65}. An ongoing study in South Australia reports preliminary findings regarding social health issues experienced by the first 300 women in their study\textsuperscript{74}. Among these women, 87\% experienced at least one social health issue or stressful life event during their pregnancies, with the most common issues reported being upset by family arguments (55\%), death of a family member or friend (42\%), housing problems (37\%), being scared of other people’s behaviour (34\%), being humbugged (pestered for money) (33\%), being very sick or badly hurt (25\%), leaving home because of a family argument or fight (21\%), being pushed, shoved or assaulted (16\%) and their partner having problems with drugs or alcohol (16\%). Seventy-two percent of younger women (aged
15 to 24) reported experiencing three or more of these events, especially housing problems, family arguments, violence and drug and alcohol problems in their partners. The rates of these stressors were compared with non-Indigenous pregnant women from Victoria and South Australia in 2008, with 18% of the non-Indigenous women reporting three or more stressors during pregnancy, compared with 52% of the Indigenous women.

Other issues identified as contributing to antenatal smoking and acting as barriers to cessation include boredom, alcohol and behaviour of others. Partner smoking was confirmed as an independent risk factor for smoking among pregnant Indigenous women in Townsville, with 54% of smokers having a partner who smoked, compared with only 31% of non-smokers.

**Pregnancy as opportunity**

**Benefits from smoking cessation interventions**

The latest Cochrane systematic review of antenatal smoking cessation interventions has demonstrated an improvement in perinatal outcomes, with reductions in low birth weight and preterm birth and an increase in mean birth weight, from implementation of cessation interventions. Low birth weight and preterm birth are considerably more common among Indigenous births than non-Indigenous births, with smoking confirmed as a risk factor for these outcomes, suggesting that supporting pregnant Aboriginal and Torres Strait Islander women to quit smoking is likely to yield considerable benefits.

National guidelines have been developed recommending that all pregnant women be assessed and supported to quit smoking using the 5 As approach (Ask, Advise, Assess, Assist, Arrange follow-up). It is recommended that assessment and support should be systematic and routine, repeated at every visit, documented in the antenatal record and tailored to individual women’s circumstances. Nicotine replacement therapy is recommended if women are otherwise unable to quit.
A teachable moment

Pregnancy is recognised as a teachable moment – a time when a woman is more motivated than usual to change her behaviour\textsuperscript{113}. Teachable moments are characterised by 1) a person having an increased perception of risk, 2) a strong emotional response to the perceived risk, and 3) a redefinition of an individual's self-concept or social role\textsuperscript{113}. Pregnancy meets these criteria, as women are aware that their smoking increases risks of adverse birth outcomes for their foetus, to which they are strongly emotionally attached. The woman's social status is changing, as she is now pregnant, and if this is her first pregnancy, this change in status also includes becoming a mother. Thus, women are more motivated to quit than usual, and if this motivation is combined with new skills and an increase in self-efficacy related to cessation, women are more likely to quit smoking\textsuperscript{113}. That women are more likely to quit during pregnancy has been confirmed in the general pregnant population, with high spontaneous quit rates and other women greatly reducing the amount smoked\textsuperscript{113-116}. However, this is less clear for Aboriginal and Torres Strait Islander women. A qualitative study from Western Australia has reported that many women reduced the number of cigarettes smoked, but few actually quit completely, finding the competing pressures to smoke too great to overcome. However, there was a recognition that quitting was preferable\textsuperscript{62}.

The role of antenatal care providers

Given the considerable harms from smoking, the benefits of quitting and the recommendations of the national guidelines, antenatal care providers have a duty of care to provide smoking cessation support. They are also in an ideal situation to do so. Women attend for antenatal care repeatedly throughout their pregnancies. National perinatal data indicate that 78\% of Aboriginal and Torres Strait Islander women attended for at least five antenatal visits in 2010\textsuperscript{29}. The proportion of Indigenous mothers who attended for their first antenatal visit within the first trimester increased from 52.0\% in 2007 to 59.7\% in 2009\textsuperscript{117}. Thus, the majority of women are in contact with antenatal providers throughout pregnancy and are seeking their care.
**Low levels of nicotine dependence**

There is evidence from several studies that a significant proportion of pregnant Aboriginal and Torres Strait Islander women have low levels of nicotine dependence. In Townsville, 60% of 201 pregnant smokers attending for antenatal care smoked fewer than 10 cigarettes daily, with 40% of smokers scoring three or less on the Fagertrom Test for Nicotine Dependence, indicating low levels of dependence. A NT study found that 71% of pregnant smokers smoked fewer than 10 cigarettes per day. These data suggest habit and social factors may be more important drivers of smoking for many pregnant women than physical nicotine dependence, and that addressing these factors may help women to quit.

**Developing the research**

**Responding to an identified need**

In late 2006 the Aboriginal Maternal and Infant Health Service (AMIHS) within the North Coast Area Health Service (NCAHS) in NSW expressed a desire to improve the smoking cessation support they provided as part of their antenatal care. The AMIHS teams offer outreach antenatal care from a community midwife and Aboriginal Health Education Officer (AHEO) or Aboriginal Health Worker (AHW) in sites across NSW. The program uses a continuity-of-care model, and its implementation has improved access to antenatal care, with consequent improvements in infant health outcomes, including reductions in preterm births. An evaluation of the program found high levels of satisfaction with the program among women receiving care, with home visiting, inclusion of a female Aboriginal worker on the team, and support with transport to antenatal appointments, being identified as key features valued by women. However, the evaluation also found that support for smoking cessation needed to be made a greater priority. Discussions with the NCAHS AMIHS team resulted in a collaborative approach to undertaking a program of research to inform subsequent development of a smoking cessation program for pregnant Aboriginal and Torres Strait Islander women.
At a similar time in 2006, concerned about the high prevalence of smoking among pregnant Aboriginal and Torres Strait Islander women, the NT Department of Health and Family (DHF) commissioned the University of Newcastle to undertake research on smoking and smoking cessation among pregnant Aboriginal and Torres Strait Islander women in the NT. Due to a number of unforeseen circumstances, the commencement of the project was delayed and the original doctoral student working on the project completed her research elsewhere. Given the synergies with the research program for this thesis, in 2008 it was decided that the NSW and NT research would be progressed together to enable inclusion of a larger sample, and one that was drawn from two jurisdictions of Australia, covering 42% of the Aboriginal and Torres Strait Islander population of Australia.

Addressing the criteria for research with Aboriginal and Torres Strait Islander peoples

The National Health and Medical Research Council (NHMRC), in consultation with Aboriginal and Torres Strait Islander peoples, has developed six criteria which must be addressed in research related to Aboriginal and Torres Strait Islander peoples. These are each addressed below in the context of this thesis.

1. Community engagement

Following initial discussions with the NCAHS AMIHS team, formal consultations were undertaken with two local Aboriginal Councils to gain their input and advice related to the local research, and to request their endorsement of the project. The Ngayundi Health Council is the formal Aboriginal health advisory council for the NCAHS (now known as the Northern NSW Local Health District). The project was presented to this Council in late 2006. The Council endorsed the project and suggested that the research also consider the use of alcohol and other drugs by pregnant women, as they considered these to be significant concerns in the local community. In early 2007, further consultations were held with the Bundjalung Elders Council, which represents the Bundjalung communities in northern NSW. This Council also endorsed the project, including the consideration of alcohol and other drugs. The Bundjalung Elders requested that a Community Reference Group, composed of local Aboriginal women
and AHWs, be formed to guide the project, ensuring cultural security and the relevance of the project to the priorities of local Aboriginal peoples.

A Community Reference Group (CRG) was established in June 2007 composed of a local female Elder, Aboriginal women of reproductive age, AHWs, AHEOs, Aboriginal staff working in Aboriginal Community Controlled social service organisations, and the local AMIHS team. The CRG met regularly throughout the course of the research undertaken for this thesis, meeting two to three times each year as required. Throughout this period the CRG provided encouragement, advice and support to the project, discussing all aspects of the design of each study, with detailed input into the mode of data collection, interview and survey questions. Additionally, the CRG discussed the results of each study, providing insight and assistance with interpretation of the findings. The CRG oversaw dissemination of the findings locally, approving two community reports, which were distributed widely through local networks and services, as well as through other AMIHS services across NSW. Academic reports, conference presentations and journal articles were also approved by the CRG. The considerable personal investment in the project by the members of the CRG has been of immense value in ensuring the integrity and relevance of the findings.

As some of the research was undertaken with AMIHS services and their clients across NSW, further consultation with local Aboriginal communities was essential. The Aboriginal Health & Medical Research Council of NSW requires that letters approving research are provided by an Aboriginal Community Controlled Health Service (ACCHS) in each community involved in the research. Each of the relevant ACCHSs was contacted, the research discussed, and approval requested. The researchers offered to personally visit each service and meet with the Governing Board or others as appropriate. In some cases this offer was accepted, while others preferred to discuss the research by telephone, supplemented by formal letters and emails. An approval letter was received from an ACCHS for all sites involved in the research (see Appendix 4.1). Additionally, as many of the AMIHS teams were located in government health services, discussions were held with the management of each AMIHS team, with approval provided for participation in the research.
In the NT, the DHF identified a panel of Aboriginal and non-Indigenous staff to oversee the implementation of the research. These staff discussed the project with relevant service managers and staff through the standard mechanisms established by the Department for staff consultations and dissemination of information. The panel reviewed all materials and processes, including methods for data collection and the language used in the questionnaires, and provided advice to improve these. They also facilitated engagement with staff and services involved in the research.

2. Benefit
The research undertaken for this thesis has potential to bring significant benefits to Aboriginal and Torres Strait Islander peoples and the services involved in their care. As the project was initially conceived with the express purpose of developing better supports for smoking cessation among pregnant Aboriginal women, the results have already been used in developing a smoking cessation program, “Stop Smoking in its Tracks”. Although not part of this thesis, the program is being pilot tested in several sites, with the intention of generating data for a larger trial. The evidence from this larger trial will be useful in informing future program delivery and improving smoking cessation support for pregnant Aboriginal and Torres Strait Islander women, with potential for significant health benefits to women and their families.

3. Sustainability and transferability
The findings from the research for this thesis have been widely disseminated through publications in open access peer-reviewed journals, circulation of reports, and discussions with community groups and policy-makers. NSW Health was represented on the project Steering Committee and has used the findings in the development of the “Quit for New Life” program, which aims to improve cessation support for pregnant Aboriginal women. “Quit for New Life” is being implemented in AMIHS sites across NSW, demonstrating both sustainability and transferability of benefits from the research for Aboriginal and Torres Strait Islander peoples.

Based on this doctoral research, the research team worked with the CRG to develop a smoking cessation program for pregnant Aboriginal women, “Stop Smoking in its Tracks”. This program has been pilot tested in two rural sites with a small number of
women. Based on the preliminary promising results, the program has been incorporated in a large demonstration project of improved antenatal care in Brisbane – the Birthing in our Community program, which will provide further data on feasibility, acceptability and outcomes of the quitting program for a larger effectiveness trial. The inclusion of “Stop Smoking in its Tracks” in the Birthing in our Community model further demonstrates sustainability and transferability in generating health benefits for Aboriginal and Torres Strait Islander families. The evidence from the doctoral research may also be beneficial to Indigenous communities internationally, as well as policymakers, practitioners and others working with these communities, by strengthening the evidence base for effective approaches to addressing a high-priority problem.

4. Building capacity
The process of undertaking this research built capacity in numerous ways. The strong collaboration between the research team, the AMIHs teams and the CRG enhanced the skills and capabilities of all groups in undertaking collaborative, respectful and relevant Aboriginal health research in a culturally secure manner. These skills included a greater understanding of each other’s world views and perspectives, the requirements of the research processes, and culturally appropriate ways of negotiating community engagement. As described above, the results have significant potential to enhance the capacity of health services to provide smoking cessation support for Aboriginal and Torres Strait Islander families. Finally, the doctoral candidate gained considerable experience in undertaking policy relevant, culturally secure research in Aboriginal and Torres Strait Islander health.

5. Priority
The initial request for the research from the AMIHS team, the endorsement by the Ngayundi Health Council and the Bundjalung Elders Council, and the ongoing commitment and contribution from the CRG, are testament to the priority placed on this research within the local Aboriginal community. Addressing smoking to improve the health of Aboriginal and Torres Strait Islander Australians is also a priority of both State and Commonwealth Governments. The Commonwealth Government established the Indigenous Tobacco Control Initiative in 2008\(^\text{120}\), and the Council of
Australian Governments allocated nearly $200 million to reducing Indigenous smoking and its associated harms through the Tackling Smoking Initiative as part of the National Partnership Agreement on Closing the Gap in Indigenous Health Outcomes in 2009\textsuperscript{121}. Funding for this doctoral research was provided by both the NT DHF and the Indigenous Tobacco Control Initiative, highlighting the importance of this research to State and Commonwealth governments.

6. **Significance**

Smoking is the single greatest modifiable risk factor contributing to the gap in health and wellbeing between Australia’s Indigenous and non-Indigenous populations, accounting for 17\% of the difference in burden of disease\textsuperscript{40}. Smoking is also the most important modifiable risk factor for adverse pregnancy outcomes\textsuperscript{94}. This research helped to address this burden by providing data to inform development of smoking cessation interventions with the potential to benefit both the mother and the baby, with lifelong benefits to both. Importantly, low birth weight and intrauterine growth restriction are also associated with diabetes and cardiovascular and renal disease in adulthood\textsuperscript{122,123}, all of which are considerably more common among Indigenous than non-Indigenous Australians\textsuperscript{26}. Antenatal smoking more than doubles the risk of low birth weight and growth restriction, and early smoking cessation reverses this\textsuperscript{94-96}. Thus, pregnancy is an opportune time to intervene to prevent future harm for the mother, baby, family and the community.

**Gaps in knowledge**

Despite the critical importance of addressing antenatal smoking among Aboriginal and Torres Strait Islander women, and the potential opportunity this provides for reducing smoking among women subsequently, little research has addressed this issue. In order to develop effective programs to support pregnant women to quit smoking, providers, policy-makers and researchers require additional information to determine the approaches most likely to be both acceptable and effective. Specifically, information is required on 1) women’s views on smoking and cessation, 2) the drivers of smoking for pregnant Aboriginal and Torres Strait Islander women and the factors associated with cessation, 3) the current levels of support for cessation from antenatal care providers.
and the factors influencing the support offered, 4) the acceptability of different approaches to smoking cessation support among pregnant Aboriginal and Torres Strait Islander women, and the people providing their antenatal care, and 5) the existing evidence for effective interventions to support smoking cessation among pregnant Aboriginal and Torres Strait Islander women. The research undertaken for this thesis aims to help address these questions.

**Approach taken in this thesis**

This doctoral research began in 2007, as a part-time PhD with thesis by publication. During this period, there has been increased research interest in the field, with several other studies on smoking and cessation among pregnant Indigenous women being published. For example, two trials of smoking cessation interventions for Indigenous women have been published: one with Alaskan native women published in 2010\textsuperscript{124}; and one with Australian Aboriginal and Torres Strait Islander women published in 2012\textsuperscript{125}. This provided additional evidence, not available when the majority of the research for this thesis was undertaken. These trials are discussed further in Paper Seven. Despite testing intensive interventions, neither study was able to demonstrate a significant impact of the intervention on cessation, indicating that the research included in this thesis retains its currency and relevance.

The research has been undertaken as a series of studies designed to address the identified gaps in knowledge required to develop an antenatal smoking cessation program.

1. **An exploratory qualitative study involving semi-structured interviews with pregnant and recently pregnant Aboriginal women; and focus groups with older Aboriginal women, young Aboriginal women and service providers.** This study explored participants’ perceptions of the social context of smoking, smoking and smoking cessation, and factors contributing to smoking initiation among young, rural Aboriginal women in northern NSW. Some of the findings from this study are presented in *Paper One*. Not all the findings have been published, but they were used to inform the development of subsequent surveys.
2. **Surveys of antenatal care providers in NSW and the NT.** In NSW, the staff working with the AMIHS program in sites across the state (including urban, rural and remote sites), as well as some doctors working with them, were included in the study. In the NT, staff providing antenatal care in remote health services were included in the study. The mailed questionnaires explored providers’ knowledge and attitudes regarding antenatal smoking and smoking cessation, perceived barriers and motivators to cessation among their clients, and their own assessment of smoking status and provision of support to their clients. The questionnaires used with staff in both states were identical except for some minor changes to the descriptors for the service in which they worked, and deletion of a small number of questions for the NT survey. The data were combined to explore factors associated with assessment of women’s smoking status, with the results presented in *Paper Four*. The surveys also assessed their perceptions of the potential helpfulness of a range of strategies to support pregnant women to quit smoking, with these findings presented in *Paper Six*. Additionally, the surveys assessed providers’ perceptions related to use of alcohol and cannabis by their clients, but these results are not included in this thesis.

3. **Surveys of pregnant Aboriginal and Torres Strait Islander women in NSW and the NT.** In NSW, current clients were recruited by the AMIHS staff who had participated in the staff survey. In the NT, an attempt was made to recruit women through the remote services providing antenatal care. However, these services were unable to support the research in this way. In discussions with the DHF staff assisting with the research, a decision was made to recruit women through the antenatal clinic at Royal Darwin Hospital. This clinic provides antenatal care for local women throughout their pregnancies, and for women from remote communities in the Top End of the NT in the last few months of pregnancy. Due to lack of birthing facilities in remote communities, women are transported to Darwin between 30 and 36 weeks gestation and
receive the remainder of their antenatal care there. Thus, recruitment through the Darwin antenatal clinic included women from both urban and remote settings. Women were invited to participate by either the AMIHS staff (NSW) or a female AHW (NT), and those consenting were offered assistance with completion if desired.

The questionnaires used in NSW and the NT were similar, although some questions were removed from the NT questionnaire to make it shorter, and the wording of some questions was changed slightly to accommodate local terminology e.g. cannabis was referred to as yarndi in the NSW survey, but gunja in the NT survey. The questionnaires explored women’s smoking behaviour, changes during pregnancy, their knowledge of risks associated with antenatal smoking, and their attitudes to smoking and other drug use during pregnancy. *Paper Two* presents an analysis of factors associated with smoking and cessation during pregnancy, using data from both NSW and the NT. The questionnaires also assessed women’s use of cannabis and alcohol during pregnancy, and an analysis of factors associated with use of tobacco and other substances is presented in *Paper Three*. The women were asked about the care they had received related to smoking assessment and support for cessation, with these results presented in *Paper Five*. To assess women’s views on approaches that would support smoking cessation, the questionnaires assessed their perceptions of the potential helpfulness of the same strategies as those included in the provider questionnaire. These findings are compared with the provider responses in *Paper Six*.

4. **A systematic review of smoking cessation interventions for pregnant Indigenous women**. Following publication of the Australian trial of a smoking cessation intervention specifically designed for pregnant Aboriginal and Torres Strait Islander women, a systematic review was undertaken to examine the effectiveness and methodological quality of published trials. This review is published in *Paper Seven*, with an additional table in Appendix 6.1.
References


3. Aboriginal and Torres Strait Islander Commission. As a matter of fact - answering the myths and misconceptions about Indigenous Australians. Canberra: Commonwealth of Australia; 1998.


PAPER ONE

“It’s almost expected”: rural Australian Aboriginal women’s reflections on smoking initiation and maintenance: a qualitative study

The prevalence of smoking among pregnant Aboriginal and Torres Strait Islander women is driven by the high background prevalence of smoking and low rates of cessation. Social and cultural factors are recognised as influencing smoking behaviour, including initiation of smoking. However, little research in Australia has explored the meaning and perceptions of smoking for Aboriginal and Torres Strait Islander women, the social context in which smoking occurs or how these factors contribute to smoking initiation and to barriers to cessation.

Paper One reports a qualitative study with Aboriginal women and service providers in rural NSW. It was undertaken as the initial study for this thesis, in order to develop an understanding of the social context of smoking and the drivers of smoking initiation and maintenance, for Aboriginal women of reproductive age. The paper has been published in *BMC Women’s Health* (Appendix 1.1).

“It’s almost expected”: rural Australian Aboriginal women’s reflections on smoking initiation and maintenance: a qualitative study

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Abstract

Background

Despite declining smoking rates among the general Australian population, rates among Indigenous Australians remain high, with 47% of the Indigenous population reporting daily smoking – twice that of other Australians. Among women, smoking rates are highest in younger age groups, with more than half of Aboriginal women smoking during pregnancy. A lack of research focused on understanding the social context of smoking by Aboriginal women in rural Australia limits our ability to reduce these rates. This study aimed to explore the factors contributing to smoking initiation among rural Aboriginal women and girls and the social context within which smoking behaviour occurs.

Methods

We conducted three focus groups with 14 Aboriginal women and service providers and 22 individual interviews with Aboriginal women from four rural communities to explore their perceptions of the factors contributing to smoking initiation among Aboriginal girls.

Results

Four inter-related factors were considered important to understanding the social context in which girls start smoking: colonisation and the introduction of tobacco; normalisation of smoking within separate Aboriginal social networks; disadvantage and stressful lives; and the importance of maintaining relationships within extended family and community networks. Within this context, young girls use smoking to attain status and as a way of asserting Aboriginal identity and group membership – a way of belonging, not of rebelling. Family and social structures were seen as providing strong support, but limited the capacity of parents to influence children not to smoke. Marginalisation was perceived to contribute to limited aspirations and opportunities, leading to pleasure-seeking in the present, rather than having goals for the future.
Conclusions

The results support the importance of addressing contextual factors in any strategies aimed at preventing smoking initiation or supporting cessation among Aboriginal girls and women. It is critical to acknowledge Aboriginal identity and culture as a source of empowerment, and to recognise the role of persistent marginalisation in contributing to the high prevalence and initiation of smoking.
Background

Addressing tobacco smoking among Australia’s Aboriginal and Torres Strait Islander population is critically important to reducing the excessive burden of disease borne by this group\(^1\). Tobacco smoking causes or exacerbates lung cancer, chronic obstructive pulmonary disease, asthma, other cancers, cardiovascular disease, pregnancy complications and low birth weight, as well as numerous other conditions\(^2\). It is the largest preventable cause of morbidity and mortality for Aboriginal and Torres Strait Islander people\(^1\). Despite declining smoking rates among the general Australian population, rates among Indigenous Australians remain high, with 47% of the Indigenous population reporting daily smoking, compared to 20.9% of the non-Indigenous population\(^3\). Smoking rates are similarly elevated among the Indigenous peoples of New Zealand, Canada and the United States\(^4\)–\(^6\).

Socio-economic disadvantage and associated stressors are recognised as drivers of smoking internationally\(^7\)–\(^9\). While it is acknowledged that the socio-economic disadvantage suffered by many Indigenous Australians contributes to the high prevalence, the rates of smoking are higher for Indigenous than non-Indigenous Australians within socio-demographic groupings. For instance, stratifying by employment status, education or income, Indigenous Australians are almost twice as likely to smoke as their non-Indigenous counterparts\(^6\). Similarly, in New Zealand, within all age, gender and socio-economic groupings, the prevalence of smoking among Maori is higher than among non-Indigenous New Zealanders\(^10\), indicating that factors beyond socio-economic differentials are contributing to differences in smoking behaviour. However, there is still limited empirical evidence to increase our understanding of the processes driving this differential at the local level or the best approach to reducing it.

Among Australian Aboriginal peoples, the experience of colonisation has contributed to the use of tobacco through both the social consequences of colonisation and the introduction of tobacco\(^11\)–\(^13\). Tobacco was used traditionally in northern Australia,
through trade with Macassan fishermen, but its availability was seasonal and its use regulated through social control mechanisms\textsuperscript{11,12,14}. In south-eastern Australia, tobacco was not used traditionally\textsuperscript{11}. Following European colonisation, tobacco became more widely available throughout Australia and was included in rations on missions and cattle stations\textsuperscript{11}. Thus, although the traditional patterns of use varied, the coming of Europeans greatly increased supply, and created widespread use of tobacco among Aboriginal peoples. Social consequences of colonisation contributing to the high rates of smoking include the experience of land dispossession, loss of language, culture and social systems\textsuperscript{15}, and subsequently becoming a marginalised group with considerable socio-economic disadvantage and high levels of stress\textsuperscript{11-14,16}. Normalisation of smoking in Aboriginal communities and the cultural value placed on maintaining interpersonal relationships through reciprocity and sharing of resources are also considered to contribute to the high prevalence of tobacco smoking\textsuperscript{11-14,16}.

Smoking is the most important preventable cause of foetal and perinatal mortality in western countries\textsuperscript{17}. Indigenous births in Australia are characterised by a higher proportion of premature births, small for gestational age babies and low birth weight babies relative to births to non-Indigenous women\textsuperscript{18,19}. Smoking is an independent predictor of these outcomes among Indigenous women\textsuperscript{2,19,20}. In 2007 the prevalence of smoking among pregnant Indigenous women in Australia was 51.8%, compared to 14.8% in non-Indigenous women\textsuperscript{18}. In the same year, 12.5% of Indigenous births were low birth weight, and 13.7% were premature, compared with 5.9% and 7.9% respectively for non-Indigenous births\textsuperscript{18}.

Addressing smoking during pregnancy requires an understanding of factors influencing being a smoker at the beginning of pregnancy, and those influencing cessation or continuation during the pregnancy. A large body of work has explored the factors influencing tobacco initiation and identified the role of peers\textsuperscript{21,22}, the social and physical environment\textsuperscript{23-25}, and parental behaviour\textsuperscript{26-28} as influential in uptake of smoking. Qualitative research with adolescent girls has emphasised the role of smoking in self-definition, making social distinctions and acquiring status\textsuperscript{29}. However,
there has been surprisingly little work exploring smoking initiation among Aboriginal people in Australia.

In a nation-wide consultation process on Aboriginal smoking more broadly, Lindorff identified the importance of children wanting to belong and be accepted by their peer group as contributing to smoking initiation. In remote Northern Territory communities, family influences and intergenerational transmission were critical in shaping youth smoking behaviour. A recent Western Australian study with both Indigenous and non-Indigenous adolescents found that smoking status had little relevance to friendship selection but that lower socio-economic and Aboriginal adolescents reported more peer pressure to try smoking. Smoking rates are also elevated among Native American and First Nations Canadian youth, relative to non-Indigenous youth in North America. Correlates of smoking among Indigenous North American adolescents include death or loss of a friend or family member and other stressful life events, and maternal smoking during and after pregnancy. Greater academic orientation has been identified as having a protective effect. Indigenous youth have also been found to have greater exposure to tobacco in the home environment, to have higher access to cigarettes and greater exposure to smoking peers than other groups.

While there is a growing body of research on Indigenous Australian smoking, particularly in remote communities, we are unaware of any work specifically examining the social context of smoking or its initiation by Aboriginal women in rural Australia, where 43% of the Indigenous population live. Given the importance of contextual factors in shaping smoking behaviour, an understanding of the experiences of rural Aboriginal women is critical to developing effective approaches to reduce their tobacco use. In rural Australian towns, the Aboriginal population is generally a minority group living among a dominant non-Indigenous population, grouped together on housing estates and in Aboriginal communities. Due to earlier government policies, including forced relocation, Aboriginal people from many parts of Australia live alongside the traditional owners. This contrasts with remote Australian communities,
where Aboriginal people are in the majority and are more likely to live on traditional lands, maintaining strong kinship ties and experiencing less cultural disruption. In this study we explore the factors contributing to smoking initiation among rural Aboriginal women and girls and the social context within which smoking behaviour occurs.

**Methods**

This exploratory qualitative study involved rural Australian Aboriginal women and service providers in focus groups and semi-structured interviews, to explore their perceptions of social and environmental factors contributing to the high prevalence of smoking, and the role of individual, family and community influences on smoking initiation. The approach was informed by a belief that the social reality for our participants could only be understood through their interpretations of their experiences. The approach was also influenced by Indigenist methodology, which emphasises the importance of relationality, reciprocity and respect. This was manifest through a collaborative approach with the local Aboriginal community from the inception of the study to its completion. The findings presented here are part of a larger project addressing smoking and smoking cessation during pregnancy. The study commenced in June 2007, with data collection between September 2007 and February 2008. Ethical approval for this study was obtained from the North Coast Area Health Service Human Research Ethics Committee and the Human Research Ethics Committee of the University of Newcastle (Appendix 3.2).

Initial consultations were held with the local Elders Council (Appendix 3.1). A community reference group (CRG) was formed on their advice, to guide the study and ensure it was conducted in a culturally secure manner. The CRG was composed of five Aboriginal women from the community and five female Aboriginal Health Workers working in maternal and child health. Aboriginal Health Workers are a specific category of Australian health professional. They work in a variety of roles and settings to help bridge the cultural gap between Aboriginal people and the western medical system. The CRG provided advice on the research questions, study design, participant recruitment, interpretation and reporting of results, and met six times during the
course of the study. The research team was comprised of non-Indigenous academics and a female Aboriginal community researcher. For this project we collaborated with the community Midwife and Aboriginal Health Worker from the local Aboriginal Maternal and Infant Health Strategy (AMIHS) antenatal team.

**Study site**

The research was undertaken in a coastal, river region of NSW. It is a rural area, with numerous small communities scattered among towns and regional centres, similar to other coastal areas of Australia. The area experiences considerable socioeconomic disadvantage, with the highest rates of people receiving unemployment benefits (7.7%) and disability or sickness benefits (13.2%) of any Health Area in NSW. Within this area, the AMIHS team provides antenatal care in several communities, including a regional centre of 45,000 people, in which the Aboriginal population is clustered within two suburbs, a town of 17,000 people, a village of approximately 500 people and several Aboriginal communities located on community owned land. Aboriginal people, who make up approximately 3.7% of the population in the area, come from across Australia and are not necessarily related to each other.

**Data collection**

**Focus groups**

Three focus groups were held prior to the interviews. Focus groups were used initially to explore the range of issues and perspectives that could be elicited through this interactive approach to data collection. They were also useful in understanding the most appropriate language and colloquial expressions to use, and to assess the acceptability of discussing potentially sensitive issues prior to the individual interviews. The first focus group was held with six Aboriginal Health Workers and one non-Indigenous midwife (the “clinicians’ group”). Most of the participants were members of the local Aboriginal community, and all provided services within the community and had extensive knowledge of both health behaviours and factors influencing behaviour locally. It was felt that their experiences in providing health care might provide additional valuable insights into smoking behaviour not identified through discussions...
with other participants. The second focus group was with older community women (over 25 years) and the third with younger women (less than 25 years). These two groups were held separately as their experiences and perspectives were likely to differ, and each may feel less constrained in separate forums. The participants were identified by members of the CRG as being articulate and knowledgeable members of the community. They included smokers and non-smokers, and women who were mothers and grandmothers, and girls who had not had children. The focus groups, lasting approximately two hours, were conducted by two female researchers – one Aboriginal (JG) and one non-Indigenous (MP).

**Semi-structured interviews**

Following the focus groups, individual semi-structured interviews were held with 22 other local women who were either currently pregnant or had given birth within 12 months. Individual interviews were important for understanding individual views and experiences and for capturing women’s personal stories. As smoking during pregnancy was the focus of the larger study, it was important to recruit women with recent experiences of pregnancy. Interviews were conducted by the Aboriginal researcher at sites selected by the women to maximise their comfort with the interview. These included parks, riverbanks, a skatepark and private homes.

**Recruitment**

Women were recruited by the antenatal team or members of the CRG, who explained the study and then provided contact details of interested women to the Aboriginal researcher. She contacted the women, provided written information (Appendix 3.3) and arranged the women’s attendance at either a focus group or an individual interview, as appropriate. Purposive sampling to maximise variation ensured inclusion of smokers and non-smokers, and women from a variety of locations and with a range of ages and parity. Thematic saturation was achieved in relation to responses from women who smoked and from those who had quit during pregnancy. We were unable to recruit sufficient non-smokers to achieve saturation regarding never smoking or successful permanent quitting. All non-smoking clients of the

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1 There were no women aged 25 years
antenatal service at the time were interviewed. All participants provided written consent (Appendix 3.4).

**Topic areas**

Topics explored in both the focus groups and individual interviews were identified from a review of the literature on smoking initiation and Indigenous smoking, and through team and CRG discussions. A topic list guided the process (Appendix 3.5), but respondents were encouraged to talk freely, telling their stories in their own way. The flexible interview guide allowed exploration of additional issues raised by women within the interview and in subsequent interviews. Women were encouraged to discuss both their own experiences and their observations and perceptions of the behaviour of others. Topics included:

- **Social and environmental factors:** the social, cultural and physical environment, and people’s perceptions of how this influenced smoking behaviour; social norms and expectations related to smoking; general perceptions of smoking; prevalence of smoking; acceptability of smoking generally and for different groups or circumstances

- **Smoking initiation:** experiences with starting smoking, including the circumstances of starting; factors influencing decisions regarding smoking; role of others in starting smoking; views on why girls start smoking; access to and sources of cigarettes.

**Data management and analysis**

Focus groups and interviews were digitally recorded and transcribed verbatim. Each transcript was reviewed for accuracy and then offered to participants for review and comment. A content analysis process was used to reveal codes relevant to themes related to the study topic and to identify additional themes. Transcripts were read repeatedly by the first author to familiarise herself with the data. Initial codes were identified, and the findings related to these codes summarised and presented to the CRG for discussion and further refinement. Initial codes either related specifically to the interview topics or were derived from the data. Transcripts were then line-by-line coded, with the codes revised from the CRG meeting, using N-Vivo 7. Further codes
were developed as additional concepts were identified. The data were organised into themes based on patterns identified, with further review of themes and their relationships to each other and to various stages of smoking behaviour. Comparisons were made between responses from the focus groups and the individual interviews and between women based on the sampling approach (age, parity and location). The results were presented to the CRG at intervals throughout the analysis, to confirm interpretation and further elaborate issues.

**Results**

Fourteen women participated in the focus groups: seven in the clinician’s group, three in the older women’s group and four in the young women’s group. The focus group participants included smokers, ex-smokers and women who had never smoked. Some were mothers of young children or of teenagers; others were grandmothers or girls without children. The Aboriginal Health Workers came from both government and non-government services, and had all been working in the field in excess of 10 years. The characteristics of the 22 women interviewed individually are shown in Table 1.1 (See Appendix 3.6 for the questionnaire from which these data were obtained).

Data from the focus groups and individual interviews were similar in providing individual, personal experiences, with the exception that the clinician’s focus group also discussed issues from the perspective of people providing community services. While there was some variation in responses between older women and younger women, as reported here, there was no clear pattern by parity or location. Women who had never smoked reported different personal experiences to those who smoked, but their views of the factors influencing smoking behaviour were similar to those who smoked.
Table 1.1: Characteristics of women interviewed (n=22)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Mean (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td>24.9 (17-41)</td>
</tr>
<tr>
<td>Educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 10 or less</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Year 11</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Certificate/diploma</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Income source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Welfare</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Pregnancy status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnant now</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Recently pregnant</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td>2.1 (0-7)</td>
</tr>
<tr>
<td>Tobacco smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never smoked</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Quit during pregnancy</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Cut down during pregnancy</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Increased</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Results on environmental factors influencing smoking are presented first, to provide the context for smoking behaviour, followed by the results specific to smoking initiation. In the following sections we elaborate on the four themes which provide insights into the social context in which Aboriginal girls in these communities start smoking: colonisation and the introduction of tobacco; separate Aboriginal social networks and normalisation of smoking within these networks; disadvantage and stressful lives; and the importance of maintaining relationships.
Contextual factors contributing to the high prevalence of smoking

Colonisation and introduction of tobacco

European colonisation created extensive disruption to Aboriginal society, including dispossession of traditional lands, movement of people, removal of children, loss of traditional lifestyle and introduction of tobacco and alcohol\(^49\). The introduction of tobacco by Europeans, together with other lifestyle changes, were raised by participants in each of the focus groups and by some older women in interviews. People no longer live traditionally, and with the lifestyle changes, women reported less respect for elders and the loss of other traditional behavioural constraints. It was recognised that traditional smoking had occurred in other parts of Australia, but in the context of ritual and ceremony, with limits around smoking, which no longer apply. Tobacco is now readily available, with few social proscriptions on its use.

So there was things that were in place, there were controls put in place, whereas now we have no controls. Stuff comes in, anybody can smoke anything, ... there’s no rituals....

Clinicians’ focus group

We never had smoking from our previous ancestors, we never had smoking. It has a lot to do with Western society bringing it, ... If it was never introduced, same as alcohol, then maybe we probably wouldn’t have people smoking, yeah. ... It’s changed our whole way.

41-year-old ex-smoker, mother of 6

Social networks and community norms

Despite mostly living in towns with large populations of non-Indigenous people, the Aboriginal population tends to remain relatively socially separated from the non-Indigenous population. This, combined with different social norms regarding smoking, creates a situation where many people have limited interaction with non-smokers. The participants described very separate Aboriginal social networks embedded within the broader community. The CRG discussed this issue extensively and confirmed that local
Aboriginal people mainly interact with other Aboriginal people. They indicated that this is partly due to a preference for socialising with relatives and others who share similar culture, values and history, and the strong social support gained through these networks. However, it was also thought to be due to experiences of exclusion or marginalisation from mainstream society in regard to participation in work, school and other civic activities. While some Aboriginal people in the community have jobs, many do not. For these people, there are limited opportunities for interaction with the broader community’s social institutions and people, and the extent of social separation is greater.

The participants reported a high prevalence of smoking within the Aboriginal networks, which then leads to a perception that smoking is normal and part of Aboriginal identity. The limited interaction with the broader community also limits exposure to non-smokers and to changing attitudes to smoking. Women reported that smoking was generally acceptable, provided household rules around smoking outside or away from children or sick people were respected.

*When you don’t smoke you stand out a bit, you feel a bit odd.... Cause everyone around you smokes. Everyone that I know smokes. There is not one person that I know in [town] who doesn’t smoke. So like, it is a bit hard [not to smoke].*

24-year-old smoker

*I reckon about 95 per cent of Koori people smoke.... Every household just about like I say, 95 percent have got people smoking.*

33-year-old smoker

**Disadvantage and stressful lives**

Women in these communities suffer from excessive levels of daily stress as a result of numerous social, emotional and financial pressures. High unemployment and associated poverty lead to difficulties finding affordable housing. Overcrowding is common, as extended family and friends frequently stay for lengthy periods, exacerbating financial and social pressures. Relationship difficulties and loss of family
members through death or removal of children further contribute to high stress levels. Participants considered that these frequent daily stressors contributed to the high prevalence of smoking and other substance use, as these were used to provide temporary relief.

Many participants spoke about grief and loss in their everyday lives. During the period of data collection there were many deaths in the Aboriginal community, including two of the participants. The frequent and often premature deaths mean that funerals become an everyday event, which both bind the community together and cause considerable grief. Several of the women interviewed had lost one or more of their parents as children, either through death or being removed from parental care. Others had experienced removal of their own children, and there were many stories of physical and sexual abuse of children. Many women had also experienced violence and/or sexual abuse as adults.

*I was only with this bloke for 2 months. I got kicked out of my place. He had holes in my walls. I just left everything, all my possessions, ... and went to where I could get support from family. .... Now back on my feet - now all I need to do is get a place.*

*and*

*I was molested by the same people that looked after me, my mum’s sister’s husband. My mum died when I was like 8 and we didn’t pretty much know dad. He died. ... I nearly tried to kill myself.*

Interviewer: *And what did your aunty do ...?*

*She didn’t know nothing. I didn’t tell her because she was dying of cancer. .... I kept strong for her, held it in, you know.*

28-year-old smoker

They also described experiences of perceived racism, including difficulties finding housing and jobs, police harassment and being confronted with negative stereotypes. They felt this reflected the lack of interaction between Aboriginal and non-Indigenous people. The experience of racism, combined with grief and loss, ongoing violence, high
unemployment and lack of housing, created high levels of stress in the women’s lives on an ongoing basis.

**Maintaining relationships and sharing**

Relationships with other members of the extended family and community are highly valued in Aboriginal culture and may be given priority over individual needs. Maintenance of these relationships involves considerable social interaction and reciprocity, with obligations to share time and resources, including food and accommodation. Participants described extensive and complex relationships, both within the extended family and the larger Aboriginal community, with family and friendship networks extending over large geographic areas. Obligations to give cigarettes to others were described by nearly all participants, and many also described an obligation to accept offered cigarettes. Sharing a cigarette and having a yarn was an important social activity, contributing to a sense of belonging to the Aboriginal community.

While providing cigarettes to others was sometimes resented due to their high cost, they were seldom refused. Older women mentioned family arguments resulting from the obligation to share cigarettes, and themselves resorting to hiding part of a packet in order to reduce this obligation. The willingness to share appeared more common among younger women who possibly had fewer financial responsibilities or less established nicotine dependency.

*Don’t believe in arguing over smokes, you got it, you give it, you don’t, you can’t.*

17-year-old smoker

*They’ll ask (partner) and they’ll get him on his own when I’m not around.... When he gives out smokes that’s when I get shitty. Don’t give them smokes, come back here and gives us smokes first and then we’ll give you a smoke, ‘cause we ain’t rich...*  

28-year-old smoker
Initiating smoking

The 20 ever-smokers among the women interviewed individually reported starting at a mean age of 15 years (range 12-21) and becoming regular smokers at a mean age of 16 years (range 12-21). Every participant expressed the view that children were starting smoking at a younger age now than previously, with many children starting at age 12 or 13, and some starting younger.

Within the context of separate Aboriginal social networks, considerable disadvantage, and a high prevalence of smoking, young girls use smoking to attain status and assert their group membership and Aboriginal identity. Family and social structures, while providing strong supports, limit the capacity of individual parents to influence their children not to smoke, and provide children with ready access to cigarettes. The experience of marginalisation is considered to contribute to limited opportunities and aspirations for young people, leading them to seek pleasure in the present rather than having goals for the future. We elaborate on these themes below.

Peer influences and needing to belong, smoking as status

Peer influences were manifested through girls wanting to be like others, socialise with them and belong to their group, rather than through overt peer pressure. Transition from primary school to high school was a particularly vulnerable point where girls negotiated new relationships and used smoking as symbolic “adult” behaviour to gain status and be accepted. In describing their own experiences, women emphasised the role of Aboriginal peers, particularly cousins and friends, in influencing them starting smoking. Most reported having their first cigarette because of the social aspect of smoking, wanting to fit in with their friends and belong to the group. Some women reported having their first cigarette while drinking with friends or family and that smoking was just part of the whole social process. While most women did not feel pressured to start smoking, a few did describe feeling pressured, and despite not wanting to, smoking in order to belong. However, the emphasis expressed by the vast majority related to the desirability of belonging and participating in the social activities of the group, more than a pressure to smoke.
Friends, friends. Because when I first started smoking my influence was my friends were smoking, and I thought - well they’re smoking, so I’ve got to start smoking. Yeah, so it’s more a friends thing, and sometimes it can be you see your parents do it as well.

24 year old, started age 15

Although they described some mimicry of smoking and experimentation with cigarettes among very young children, regular smoking among primary school children was uncommon, and children would often tell adults they shouldn’t smoke. However, once children went to high school they rapidly took up the habit. Many participants felt that the main motivator among young high school students was to appear older and “cooler” and to be accepted by older adolescents in the school. The transition to high school was difficult, particularly for children who didn’t engage well with the school system, and smoking was thought to be used by children to attain higher or “adult” status.

Participant 1: As soon as they hit high school, that’s when they’re into it straight away.
Participant 2: Some of the young ones, like some young ones at home, that hang around with high school ones … and they think they’re real deadly and they’ll give them a couple of draws but they might not full on start, but once you get to high school – it’s gone!

Young women’s focus group

When I was a young girl, I was in this group and most were older than me and it was like a cool thing, all your friends are doing it. I felt left out so I just started asking. I thought I was a big woman [laugh]. I was only 13. I didn’t like it though.

33 year old smoker

Development of identity
Growing up in a marginalised social group where smoking is a normalised and common behaviour, children are socialised to smoking from an early age and may incorporate it into their sense of identity. Internalisation of a smoking identity as part of their overall
identity was described by many women and discussed by the CRG. For children growing up in Aboriginal families where smoking is common, smoking becomes incorporated into their identity and becomes blurred with their Aboriginal identity. The women felt that there was an unspoken expectation that children would become smokers.

*Your mob smokes, so it’s in your blood to do it.*

19-year-old smoker

*I dunno it’s almost expected isn’t it like? ... I dunno, I never thought about that, but yeah. Probably it’s almost expected.*

33-year-old smoker

**Social structure and parenting**

The extended family structure and communal network among Aboriginal people are strong in both the geographically isolated communities and within the larger towns. Many households are large and fluid, with people coming and going, and extended family members of multiple generations living together for lengthy periods. Raising children is often communal, with extended family members or friends frequently caring for children. The social structure of Aboriginal communities and shared child-rearing, when combined with the high smoking prevalence, were identified as contributing to children initiating smoking. Individual parents have less control over their own children’s behaviour, and there are fewer clear behavioural limits, with children frequently exposed to many people smoking.

*People start smoking] younger in the Aboriginal community, because they’re all around each other. ... all their family is one big family.... all together.... Most of the parents out there don’t teach their kids or it’s other people doing it for them. It’s other people because mainly someone’s always watching them.*

23-year-old smoker, mother of 2

Women expressed paradoxical views regarding parental ability to influence their children’s smoking behaviour. Although most women felt that the high prevalence of
smoking among their parents and extended family had been influential in normalising smoking and making it more acceptable for them to start, they did not think that parents could influence children not to start smoking. Only one woman thought she would be able to influence her children not to smoke because neither she nor her partner smoked. Most women who were parents were resigned to the idea that their children would smoke.

Yeah I always think to myself, I don’t want my boys to smoke cigarettes ... but like if they’re going to do it, then they’re going to do it. I can’t stop them from doing it. I’ll try, but I know I’m not going to be able to.

24-year-old smoker, mother of 4

When asked where children obtained cigarettes, the smokers reported that they had obtained cigarettes from friends and cousins, or by taking them from adults’ packets. The high prevalence of smoking, combined with the highly connected communal structure, meant there were many possible sources of cigarettes. No one was aware of shops which sold cigarettes to minors, but some reported adults buying packets for children, or giving them single cigarettes, particularly if they were related to them and felt obliged to share their cigarettes. Others reported that adults were less likely to give children cigarettes now than in the past, due to increased awareness of the problems with smoking.

**Lack of opportunity and present orientation**

Limited opportunities for adolescents in rural towns and villages are exacerbated by marginalisation and felt more profoundly by disadvantaged groups with limited resources. Lack of opportunities may create boredom, limit aspirations and lead to a focus on immediate gratification. Participants believed that limited opportunities for Aboriginal children and adolescents in the region contributed to early initiation of smoking. In smaller communities, lack of local sports facilities, combined with poor public transport, made it very difficult for children to engage in sports or other activities. The clinicians’ focus group and some older women also thought that lack of
employment prospects resulting from limited social connections and racism played a role, as it inhibited the ambitions of high school children. These children then perceived little benefit from applying themselves in school and had few aspirations for their future. The clinicians reported difficulty motivating children and adolescents, as it was difficult to demonstrate success.

How are we supposed to stop people from having anything like that when, you know, it’s hard to even get them to keep going to school ... when they’re closer to leaving school age, and they know there’s nobody in their family or anybody has got a job ...

Clinicians’ focus group

The boredom and lack of routine among unemployed adolescents who had left school also contributed, with some young people living hedonistic lifestyles, with little concern for the future. The participants in the young women’s focus group expressed an orientation toward pleasure rather than concern for their future health.

Participant 1: That’s how you think – I’m going to die anyway, I might just do what I’m enjoying.
Participant 2: Like we gunna die of something.
Participant 3: Yeah, instead of thinking “Oh, I could give up and go and have a really good, happy, healthy life and live longer” ... Like you don’t really think that way, you just think I enjoy this, I’m going to do it whatever.

Young women’s focus group

Protective influences
Anti-smoking parental advice and role modelling, and success in school, sports or other activities, provided a protective effect from early smoking initiation for girls. Involvement in competitive sports gave girls an incentive to keep fit, friends who were non-smokers and disapproved of smoking, and alternative ways to gain acceptability and status. Several women reported only initiating smoking after discontinuing competitive sports, and consequently had started later than the other participants.
The women who had continued their education to year 10 or beyond had also started smoking later than women who left school earlier.

*Sport tends to help them. If they’re very into sport that usually will help them find another avenue, and also other non-smokers to go with. So it’s not cool then. They might say they’re bloody stupid or something.*

Clinicians’ focus group

*I started when I was 21…. I wish I was still fit, that I didn’t start smoking…. because I never was interested in smoking, like I wasn’t even really into boys…. I was worried about school and my sport.*

24-year-old smoker

The two participants who had never smoked had been involved with sports, and one continued to play several sports. One also expressed concern with her health and emphasised the importance of her family influences; neither of her parents smoked, and they had educated their children about the dangers of smoking, none of whom took up smoking. She described warning her own children about the dangers of smoking, and trying to ensure they weren’t exposed to other people’s smoke.

*I didn’t like the stuff. And my parents made us aware of it growing up. They just, you know, told us if you want to smoke you know it’s bad for your body, bad for your lungs and it’s better, best to be clean.*

25 year old, never smoked

**Discussion**

We used qualitative methods to explore Aboriginal women’s understandings of the social context of smoking and smoking initiation in rural communities in coastal NSW. The findings confirm the importance of the social and historical context in creating a pro-smoking environment, with numerous external factors interacting with personal
factors to drive the early initiation of smoking. Socio-economic disadvantage, housing shortages and high unemployment are associated with high levels of stress and contribute to the perpetuation of smoking. These findings support the importance of the social determinants of health in contributing to disparities in smoking rates. Further, they highlight the need to address these issues in strategies aimed at reducing Indigenous disadvantage. 

The importance placed on maintaining relationships, with the associated obligation to share resources, was found to contribute to the high rates of smoking, consistent with earlier research. Women derived clear social benefits from sharing cigarettes and a sense of belonging to the community through smoking. In their work in two remote Northern Territory communities, Johnston and Thomas emphasised the value placed on reciprocity and sharing, and the role that cultural obligations play in smoking behaviour. They argued that these cultural factors add another layer of complexity to social dynamics, resulting in qualitatively different drivers of smoking maintenance to those experienced by non-Indigenous disadvantaged groups with high smoking prevalence. In our setting, Aboriginal people constitute a small minority of the population, and many come from other parts of Australia, thus reducing kinship ties. However, the emphasis placed on sharing and reciprocity by our participants and the sense of connectedness and belonging to the Aboriginal community remained strong. Relative to remote communities, where Aboriginal people are usually in the majority, the situation for Aboriginal people in rural and urban Australia differs. Here, the experience of marginalisation and cultural disruption is likely to be more complex. In this context, the importance of smoking in establishing and maintaining group membership and Aboriginal identity is different, and may include stronger assertion of group identity.

In our setting, the separation of Aboriginal and non-Indigenous social networks was perceived to be important in both initiation and maintenance of smoking. Analysis of data from the Framingham Study demonstrated that smoking behaviour spreads through social networks, with smokers becoming increasingly socially marginalised.
In Australia, the role that separate social networks play in smoking behaviour among Aboriginal Australians has received little attention. However, research on psychosocial constructs mediating health behaviours related to cardiovascular disease in rural Victoria is of interest\textsuperscript{54}. The authors identified the relationships that Aboriginal people have with the broader society as an important issue. Marginalisation, restricted access to mainstream services and institutions, and racial stereotypes helped create separate social networks and impacted on health behaviours\textsuperscript{54}. An exploration of social capital and identity among Indigenous people living in metropolitan Brisbane found that respondents had strong bonding social capital through their connections with family and the broader Indigenous community\textsuperscript{55}. However, “In the context of an oppressive history and experiences of ongoing racism and discrimination, a second world of bridging social capital remains elusive to many Indigenous Australians”\textsuperscript{55}. These findings resonate with our own in articulating the importance of Aboriginal identity in social network formation, and the role social networks play in perpetuating smoking behaviour, including initiating smoking.

Our findings on the perceived influences on initiating smoking emphasise the role of Aboriginal social networks in determining peer groups and the importance of smoking in order to belong to these social groups. Arnett (2007), in his critique of the concept of peer influence, has argued that a more appropriate concept is that of peer context, which takes account of friendship selection in determining peer influences\textsuperscript{56}. In our setting, Aboriginal children are largely forming friendships with other Aboriginal children in a marginalised social network where smoking is normalised. The choice of smoking then reflects a desire to fit in and belong to this group, driven by “self-pressure”\textsuperscript{57}. Johnston and Thomas emphasised the importance of intergenerational transmission of smoking behaviour in remote Northern Territory communities, with initiation almost universally influenced by family smoking practices, rather than peers\textsuperscript{14}. Similarities with our own study include the strong environmental cues for smoking and ready access to cigarettes. Smoking as a means of asserting membership in the Aboriginal community was not identified as an important factor in the Australian remote setting. This may be because Aboriginal people form the majority in remote
communities, and thus “normalisation” of smoking works through a different mechanism. Shared care of children also limits the amount of control parents are able to exert over their own children’s behaviour and their children’s exposure to other people smoking. A similar problem has been described in Canadian First Nations reserve communities, where family obligations and crowded housing create difficulties for women in reducing children’s smoke exposure.

In a review of the social context of smoking, Poland et al (2006) emphasised the importance of viewing smoking as a collective social practice, rather than just individual behaviour. They also highlighted the role of power relations in increasing social disparities in smoking behaviour; and the role of behaviour, including smoking, in constructing and maintaining a social identity. In our study, lack of power and the experience of discrimination and marginalisation were perceived to work through several mechanisms to increase smoking initiation. These mechanisms included social separation from the broader society, a reduction in children’s aspirations, and children feeling disconnected from their schools, leading them to smoke to attain status. Smoking was also used to establish an identity and group membership. Dixon and Banwell (2009) recently reviewed the application of social theories to understanding the temporal spread of health risk behaviours, in particular the spread of smoking, among different social groups. They drew on Bourdieusian concepts to explain the persistence of smoking among some disadvantaged groups and proposed a fifth phase to the smoking transition model proposed by Lopez et al. In this fifth phase, successive cohorts of disadvantaged groups continue to adopt smoking despite widespread recognition of the harms. They suggest that intergenerational transmission of “habitus”, or way of life, combines with “doubling” or copying others in the same social group, and the need for “distinction” from other groups, to explain this continued initiation of harmful behaviours. Our own study provides some support for this, in that girls are thought to initiate smoking by adopting the behaviour of others within their social grouping, in order to assert their identity and membership of that group, and distinguish themselves from others.
Limitations and strengths

This study is one of the first that has explored the social context of smoking and smoking initiation among Aboriginal people in rural Australia, shedding new light on this important issue. The study benefited from input from Aboriginal women from its inception, including having a respected Aboriginal woman conduct all interviews. Assistance and input from the CRG helped optimise cultural security and the exploration and interpretation of key concepts. Additionally, local community engagement was enhanced by providing verbal feedback and a brief written report which was widely circulated.

The findings from this study must be considered within several limitations. The study was conducted in a limited geographic area and may not reflect the experiences of Aboriginal women elsewhere, as there is considerable variation between Aboriginal communities. However, some of the issues identified relating to the social context may be similar in other rural Indigenous communities in Australia. We focused on female smoking and perspectives, with the majority of participants being poorly educated and unemployed. Capturing the voices of this marginalised group of women is valuable. However, it is likely that more educated, employed women may have different experiences, and it is important that experiences of these women and of men are explored in future studies. Additionally, we were unable to recruit many non-smokers, and their story is clearly important for future research. A further limitation of the present study design is that smoking initiation may have taken place a long time in the past, given that the age of our interviewees ranged from 17 to 41 years. Contemporary influences and experiences of Aboriginal girls may differ, and further research to extend our insights would be valuable.

Conclusions

Through listening to the stories of Aboriginal women and their health care providers, findings from this study provide insights into social and cultural influences concerning smoking initiation and maintenance by Aboriginal girls and women. The findings support the importance of addressing contextual factors in any strategies aimed at
preventing smoking initiation or supporting cessation among Aboriginal women. Recognising the perceived benefits of smoking and finding alternative ways for young women to feel included and positive about a meaningful future are essential. This will include supporting them through school transitions and improving educational and employment opportunities. Community involvement is necessary to shift norms and expectations regarding smoking among Aboriginal people, with recognition that cigarette smoking is not part of traditional Aboriginal culture. Movement forward on this health issue will require acknowledgement of the importance of Aboriginal identity and culture as a source of strength and empowerment, while recognising the role of history, dispossession and persistent marginalisation in perpetuating social and financial disadvantage and contributing to the high prevalence smoking.
References


PAPER TWO

Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions

National data report the high rate of smoking among pregnant Aboriginal and Torres Strait Islander women. Studies in other populations have demonstrated that pregnancy is a “teachable moment” – a time when women are more likely to quit smoking, or to reduce the amount smoked. However, there is little research with Aboriginal and Torres Strait Islander women assessing the extent to which pregnancy operates as a “teachable moment”. There has also been little research exploring women’s knowledge and attitudes regarding smoking during pregnancy, and how these, and other factors, may be associated with different smoking behaviours. Understanding the factors associated with continued smoking will assist to identify barriers that need to be addressed in antenatal smoking cessation support programs.

Paper Two reports a survey with pregnant Aboriginal and Torres Strait Islander women in New South Wales and the Northern Territory. It explores their self-reported smoking behaviour with a focus on changes in pregnancy, their knowledge of risks associated with antenatal smoking, and their attitudes to smoking during pregnancy. It then assesses the relationship between smoking behaviour and these other factors. This paper has been published in *Drug and Alcohol Review* (Appendix 1.2).

Passey ME, D’Este CA, Stirling JM, Sanson-Fisher RW. Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions. *Drug and Alcohol Review*, 2012; 31:608-616.
Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions

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Abstract

Introduction and aims

Smoking rates are three times as high for pregnant Indigenous women relative to non-Indigenous women, in Australia. This paper describes Indigenous women's self-reported antenatal smoking behaviour and compares knowledge and attitudes of those who a) smoke and don't smoke during pregnancy, and b) quit or continue to smoke since the beginning of pregnancy.

Design and methods

Cross-sectional surveys with 264 pregnant Indigenous women in two states collected data on smoking status, antenatal changes, risk knowledge, attitudes to smoking, and socio-demographic characteristics. Multivariable logistic regression analyses assessed associations between knowledge and attitude variables, and smoking status and antenatal changes in smoking status.

Results

Forty-six percent of the women (n=121) reported currently smoking. The majority (68%) who smoked at the beginning of pregnancy reported quitting (21%) or reducing (47%). Relative to smokers, non-smokers had more schooling ($p=0.002$), more post-secondary education ($p=0.023$), lower parity ($p=0.003$), better understanding of smoking-related risks (miscarriage $p=0.01$; low birth weight $p=0.003$; infant illness $p<0.001$; childhood behavioural problems $p=0.007$), and less frequently expressed attitudes indicating that quitting was very difficult given other problems they faced. Similar patterns were found for women who quit during pregnancy, compared to those who continued smoking.

Conclusions

Increasing awareness of antenatal smoking risks and the benefits of quitting may motivate women to attempt to quit. However, knowledge alone is unlikely to be sufficient, considering the life circumstances of many Indigenous women. Addressing
the social environment and daily stressors, particularly those exacerbated by pregnancy, may be critical to supporting quit attempts.
Introduction

The last few decades have seen considerable reductions in the prevalence of smoking in the general Australian population\textsuperscript{1,2}. This benefit has not been shared by the Aboriginal and Torres Strait Islander (hereafter referred to as Indigenous) population, with the prevalence of smoking persisting above 50\% for many years, although there has been a recent slight reduction\textsuperscript{3,4}. Similarly, despite declining smoking rates among pregnant women generally, rates among pregnant Indigenous women remain three times those of non-Indigenous Australians (52\% compared to 15\%)\textsuperscript{5}. Factors which may contribute to these disparities include socio-economic disadvantage, marginalisation, stressful life circumstances, acceptability and normalisation of smoking within Indigenous social networks and the role of tobacco in social exchange\textsuperscript{6-10}.

The harms associated with smoking during pregnancy include risks to both mother and baby: higher rates of placental problems, low birth weight, preterm birth, intra-uterine growth retardation and perinatal death\textsuperscript{11-13}. Pregnancy is a time when many women are motivated to modify their behaviour\textsuperscript{14}. However, smoking during pregnancy among Indigenous women remains common, and perinatal data indicate low quit rates\textsuperscript{15}.

There is little assistance from the published literature to guide development of effective interventions to address antenatal smoking among Indigenous women\textsuperscript{16}. Only two studies have assessed Indigenous women’s knowledge and attitudes to smoking during pregnancy\textsuperscript{9,17}. A survey of pregnant Indigenous women in North Queensland found generally good knowledge of risks, with few differences between smokers and non-smokers on knowledge or attitude items\textsuperscript{17}. By contrast, a qualitative study in Perth found women’s specific knowledge of risks to be poor, and that pregnancy had little impact on attitudes to cessation, with most women preferring to reduce the number of cigarettes smoked, as the benefits of smoking outweighed those of quitting\textsuperscript{9}. In order to develop effective strategies to reduce the harms from
antenatal smoking, a greater understanding of the patterns of use, and of women’s attitudes and knowledge of risks is needed.

**Aims**

This paper:

1) describes pregnant Indigenous women’s self-reported smoking behaviour during pregnancy

2) compares the knowledge and attitudes of those who:
   a) smoke and don’t smoke during pregnancy
   b) quit smoking, and those who continue, among women smoking at the beginning of pregnancy.

**Methods**

This paper uses data from two cross-sectional surveys with pregnant Indigenous women – one from the Northern Territory (NT) and one from New South Wales (NSW). Both surveys used the same questionnaire. The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW.

**Recruiting participants**

NT: Women attending the antenatal clinic at Royal Darwin Hospital (RDH) were invited to participate by a female Aboriginal research assistant (Appendix 5.6), from July to September 2010 and April to June 2011. The NT Department of Health and Family (DHF) policy recommends that women give birth in a regional hospital\(^\text{18}\). The majority of women from remote communities in the Top End of the NT are transferred to Darwin for their baby’s birth and attend RDH for antenatal care in the last part of their pregnancy\(^\text{19}\).

NSW: At the time of the study, Aboriginal Maternal and Infant Health Strategy (AMIHS) teams provided antenatal care at 28 sites across NSW. All teams were invited to participate through their management structure, and 22 agreed. Women receiving antenatal care at these sites were invited by the midwife or Aboriginal Health Worker
(AHW) to participate from July to December 2009. The number of women to be recruited by each team varied depending on the team size and their catchment population, from five to 20 women.

In both NSW and the NT, women were eligible if they were pregnant and if they or their partner were Indigenous (Aboriginal and/or Torres Strait Islander). They were excluded if they were aged less than 16 years, being treated for mental illness, or unable to provide informed consent. The staff explained the study to eligible women and provided them with information sheets (Appendices 4.5.2 and 5.7). Those willing to participate completed a consent form (Appendices 4.6 and 5.8) and written questionnaire (Appendices 4.8 and 5.9). Assistance to complete the questionnaire was offered. Staff were asked to invite all eligible women to participate and to complete a recruitment log (Appendices 4.9 and 5.10) to track participation rates.

Questionnaire development and contents

1. Literature review
Concepts included were derived from a review of published literature on smoking during pregnancy and/or among Indigenous peoples. Questions regarding knowledge of risks and attitudes towards smoking during pregnancy were adapted from a questionnaire used with pregnant Indigenous women.

2. Consultation with professionals working in Indigenous health
The draft questionnaire was critically reviewed by several groups to assess content validity, reduce redundancy and refine the wording of questions to ensure cultural appropriateness. These groups included the CRG, the NT DHF, and colleagues experienced in Indigenous health research, tobacco control and questionnaire design. Minor revisions were made, with removal of some redundant questions and addition of others.

3. Pilot-testing
The revised questionnaire was pilot-tested with 15 pregnant Indigenous women in NSW and Western Australia. Feedback from these women was discussed by the CRG, with further minor changes made to the questionnaire.
The final questionnaire had a Flesch-Kincaid reading level of grade 6 and took approximately 15–20 minutes to complete. The items covered:

- Demographic and obstetric characteristics: age, ethnicity, education, if the pregnancy was planned, gestation, parity, and number of prior antenatal visits
- Self-reported current smoking status and changes in pregnancy: smoking status – current daily smoker, occasional smoker, ex-smoker or had never smoked. Those who were current or ex-smokers were asked the amount they smoked, whether they had had a cigarette in the last seven days (even a puff), the age they started smoking, and changes to their smoking status or quantity since becoming pregnant (increased, same, decreased or quit completely)
- Knowledge of risks and attitudes to smoking during pregnancy: questions were presented as statements and participants were asked to indicate if they agreed, disagreed or weren’t sure if the statement was correct
- Assistance completing the questionnaire.

**Statistical methods**

The questionnaires were computer-scannable. Data were analysed using Stata 9.2. Summary statistics of respondent characteristics were obtained. Age and years of school were categorised, and the number and percentage in each category reported. Gestation, parity and number of antenatal visits are presented as medians, due to non-normal distributions. Smoking status and changes in pregnancy are reported as proportions with 95% confidence intervals (CIs).

Based on self-reported smoking status at the time of the survey, women were categorised as current smokers (daily or occasional smokers) or non-smokers (ex-smokers or never smokers). Based on reported changes during pregnancy, women smoking at the beginning of pregnancy were categorised as having “quit” or “continued” smoking. These categories are shown in Figure 2.1. The number and percentage in each of these two groups agreeing with each knowledge and attitude statement are presented.
Figure 2.1: Categorisation of smoking status and changes during pregnancy, and analytic comparisons

Univariate associations with reported smoking status and changes in pregnancy were examined using the Pearson’s chi-square test for categorical explanatory variables and the non-parametric Mann-Whitney test for continuous explanatory variables. Multivariable logistic regression was used to determine associations between knowledge and attitude variables and smoking status, and between knowledge and attitude variables and changes in smoking status during pregnancy, when controlling for potential confounders and adjusting for clustering by site (see Figure 2.1).

Demographic and obstetric variables found to be significantly associated with smoking status (p-value<0.05) were included in multivariable models as potential confounders. State was also included in the multivariable models.

We aimed to recruit 220 women from NSW and 180 from the NT. This would allow an estimate of the prevalence of current smoking, with 95% confidence interval within ±7% of the point estimate and detection of differences in characteristics and attitudes between smokers and non-smokers of 15% or more, and between quitters and non-quitters of 20% or more, with 80% power and 5% significance level.
**Ethical approval**

The NT survey was approved by the Human Research Ethics Committees of the University of Newcastle, the NT Department of Human Services and Menzies School of Health Research (Appendix 5.1). The NSW survey was approved by the University of Newcastle, Hunter New England and the Aboriginal Health & Medical Research Council Human Research Ethics Committees (Appendix 4.2).

**Results**

A total of 264 women completed questionnaires. In the NT, 137 women were invited, of whom 107 (78%) agreed. In NSW 157 women completed questionnaires. Of these, 128 were from the 15 sites which returned participation records documenting the number of women approached and consenting. These sites had invited 146 women, giving a response rate from these sites of 88%. The remaining seven sites returned 29 completed questionnaires but did not return participation records; thus the consent rate is unknown for these sites. Seventy-three women (28%) had assistance completing the questionnaire.

**Respondent smoking status and characteristics**

Respondents’ characteristics by current self-reported smoking status are shown in Table 2.1. One hundred and twenty-one women (46%; 95% CI: 40%, 52%) reported currently smoking daily (n=85, 32%; 95% CI: 27%, 38%) or occasionally (n=36, 14%; 95% CI: 10%, 18%). Fifty-six (21%; 95% CI: 16%, 27%) were ex-smokers and 87 (33%; 95% CI: 27%, 39%) had never smoked cigarettes. Among the 177 women who had ever smoked, 116 (66%) reported smoking in the previous seven days, and the mean age of initiation was 15.2 years. Current smokers reported smoking an average of 10 cigarettes per day.

Smokers reported significantly fewer years schooling and were less likely to have any post-secondary education than non-smokers (Table 2.1). Smokers had higher parity and were less likely to be primiparous relative to non-smokers, with 56 (40%) non-
smokers being primiparous, compared to only 29 (24%) smokers (chi-square=6.93; \( p=0.008 \)).

Table 2.1: Characteristics of survey respondents by current smoking status (n=264*)

<table>
<thead>
<tr>
<th></th>
<th>Smokers (n=121)</th>
<th>Non-smokers (n=143)</th>
<th>Total</th>
<th>( p)-value**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Indigenous</td>
<td>113</td>
<td>(93)</td>
<td>123</td>
<td>(87)</td>
</tr>
<tr>
<td>State</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>79</td>
<td>(65)</td>
<td>78</td>
<td>(55)</td>
</tr>
<tr>
<td>NT</td>
<td>42</td>
<td>(35)</td>
<td>65</td>
<td>(45)</td>
</tr>
<tr>
<td>Age group – years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>22</td>
<td>(18)</td>
<td>35</td>
<td>(24)</td>
</tr>
<tr>
<td>20-24</td>
<td>41</td>
<td>(34)</td>
<td>46</td>
<td>(32)</td>
</tr>
<tr>
<td>25-29</td>
<td>33</td>
<td>(27)</td>
<td>28</td>
<td>(20)</td>
</tr>
<tr>
<td>≥30</td>
<td>25</td>
<td>(21)</td>
<td>34</td>
<td>(24)</td>
</tr>
<tr>
<td>Highest year at school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>47</td>
<td>(40)</td>
<td>30</td>
<td>(22)</td>
</tr>
<tr>
<td>10-11</td>
<td>57</td>
<td>(48)</td>
<td>77</td>
<td>(55)</td>
</tr>
<tr>
<td>12</td>
<td>14</td>
<td>(12)</td>
<td>32</td>
<td>(23)</td>
</tr>
<tr>
<td>Post-secondary education</td>
<td>40</td>
<td>(33)</td>
<td>67</td>
<td>(47)</td>
</tr>
<tr>
<td>Planned pregnancy</td>
<td>28</td>
<td>(24)</td>
<td>46</td>
<td>(33)</td>
</tr>
<tr>
<td></td>
<td>Median</td>
<td>Q1, Q3</td>
<td>Median</td>
<td>Q1, Q3</td>
</tr>
<tr>
<td>Gestation</td>
<td>30</td>
<td>(21, 37)</td>
<td>30</td>
<td>(22, 36)</td>
</tr>
<tr>
<td>Parity</td>
<td>2</td>
<td>(1, 3)</td>
<td>1</td>
<td>(0, 2)</td>
</tr>
<tr>
<td>Antenatal midwife visits</td>
<td>3</td>
<td>(2, 5)</td>
<td>3</td>
<td>(2, 6)</td>
</tr>
<tr>
<td>Antenatal doctor visits</td>
<td>3</td>
<td>(2, 5)</td>
<td>4</td>
<td>(2, 6)</td>
</tr>
</tbody>
</table>

* Numbers may not add to 264 due to missing values
** \( p\)-value for Pearson’s chi-squared test for categorical variables and the non-parametric Mann-Whitney test for continuous explanatory variables
Changes in smoking during pregnancy

The majority of women (n=99 (68%), 95%CI: 60%, 75%) who were smoking at the beginning of the current pregnancy reported either quitting completely or reducing (Table 2.2). There were 17 women (12%) who reported increasing the number of cigarettes smoked since becoming pregnant.

Table 2.2: Self-reported changes in smoking during the current pregnancy among women smoking at the beginning of the pregnancy (n=146)*

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased</td>
<td>17</td>
<td>(12)</td>
<td>7%, 18%</td>
</tr>
<tr>
<td>Stayed the same</td>
<td>30</td>
<td>(21)</td>
<td>14%, 28%</td>
</tr>
<tr>
<td>Reduced</td>
<td>69</td>
<td>(47)</td>
<td>39%, 56%</td>
</tr>
<tr>
<td>Quit completely</td>
<td>30</td>
<td>(21)</td>
<td>14%, 28%</td>
</tr>
</tbody>
</table>

* 5 current smokers did not answer this question

Knowledge of risks and attitudes to smoking

Smokers and non-smokers

Table 2.3 compares the knowledge and attitudes of women by their reported smoking status at the time of the survey. There were significant differences in knowledge of risks associated with smoking during pregnancy, with non-smokers more likely to agree that smoking increased the risk of each adverse outcome presented. There were also significant differences between smokers and non-smokers on several attitudinal items (see Table 2.3).
Table 2.3: Smokers’ and non-smokers’ knowledge of risks and attitudes towards smoking tobacco during pregnancy, controlling for confounders and adjusting for clustering (n=260*)

<table>
<thead>
<tr>
<th>Knowledge of risks</th>
<th>Smokers (n=119)</th>
<th>Non-smokers (n=141)</th>
<th>Adjusted OR** (95% CI)</th>
<th>p-value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking tobacco during pregnancy increases the risk of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscarriage (losing the baby)</td>
<td>63 (53)</td>
<td>104 (74)</td>
<td>0.4 (0.26, 0.71)</td>
<td>0.001</td>
</tr>
<tr>
<td>Low birth weight of baby</td>
<td>82 (69)</td>
<td>116 (83)</td>
<td>0.5 (0.33, 0.79)</td>
<td>0.003</td>
</tr>
<tr>
<td>Breathing problems and sickness in infant</td>
<td>79 (66)</td>
<td>119 (85)</td>
<td>0.4 (0.25, 0.58)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother having high blood pressure and increased heart ratea</td>
<td>64 (54)</td>
<td>108 (77)</td>
<td>0.4 (0.24, 0.58)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Behavioural problems in childhood</td>
<td>41 (35)</td>
<td>78 (56)</td>
<td>0.5 (0.26, 0.81)</td>
<td>0.007</td>
</tr>
<tr>
<td>Attitudes</td>
<td>Smokers (n=119)</td>
<td>Non-smokers (n=141)</td>
<td>Adjusted OR** (95% CI)</td>
<td>p-value**</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-----------------</td>
<td>----------------------</td>
<td>------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>It’s good to have a smaller baby</td>
<td>13 (11)</td>
<td>7 (5.0)</td>
<td>2.7 (0.62, 11.69)</td>
<td>0.189</td>
</tr>
<tr>
<td>I think my baby will be born healthy</td>
<td>97 (82)</td>
<td>128 (93)</td>
<td>0.4 (0.11, 1.24)</td>
<td>0.109</td>
</tr>
<tr>
<td>Light smoking does not cause harm to unborn babies</td>
<td>23 (20)</td>
<td>16 (11)</td>
<td>1.7 (0.80, 3.81)</td>
<td>0.161</td>
</tr>
<tr>
<td>Stopping smoking increases the chance of having a healthy baby</td>
<td>77 (65)</td>
<td>122 (87)</td>
<td>0.31 (0.17, 0.57)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>If you are around a lot of smoke from other people you might as well keep smoking yourself</td>
<td>41 (35)</td>
<td>39 (28)</td>
<td>1.3 (0.74, 2.40)</td>
<td>0.340</td>
</tr>
<tr>
<td>It’s OK to drink alcohol when you’re pregnant as long as you don’t drink a lot</td>
<td>26 (17)</td>
<td>14 (10)</td>
<td>1.7 (0.96, 2.95)</td>
<td>0.070</td>
</tr>
<tr>
<td></td>
<td>Smokers (n=119)</td>
<td>Non-smokers (n=141)</td>
<td>Adjusted OR** (95% CI)</td>
<td>p-value**</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Quitting smoking is just too hard. It’s not worth the effort</td>
<td>25 (21)</td>
<td>6 (4.3)</td>
<td>5.5 (1.60, 18.82)</td>
<td>0.007</td>
</tr>
<tr>
<td>Cannabis is OK when you’re pregnant because it’s natural</td>
<td>8 (6.8)</td>
<td>2 (1.4)</td>
<td>4.8 (0.97, 23.96)</td>
<td>0.054</td>
</tr>
<tr>
<td>It’s harder to quit smoking during pregnancy because of all the worries</td>
<td>60 (50)</td>
<td>15 (11)</td>
<td>7.9 (4.34, 14.45)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>You’ve got to die of something. So why give up the things you enjoy?</td>
<td>24 (20)</td>
<td>5 (3.6)</td>
<td>6.3 (3.0, 13.08)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Women will try to give up smoking and drinking for their children even if they won’t try for themselves</td>
<td>61 (51)</td>
<td>62 (44)</td>
<td>1.3 (0.98, 1.79)</td>
<td>0.065</td>
</tr>
<tr>
<td>In our community it’s OK to smoke when you are pregnant</td>
<td>Smokers (n=119)</td>
<td>Non-smokers (n=141)</td>
<td>Adjusted OR** (95% CI)</td>
<td>p-value**</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Agree n (%)</td>
<td>Agree n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 (25)</td>
<td>20 (14)</td>
<td>2.2 (1.16, 4.20)</td>
<td>0.016</td>
<td></td>
</tr>
<tr>
<td>Most women have bigger problems to deal with than trying to quit smoking and drinking</td>
<td>47 (40)</td>
<td>21 (16)</td>
<td>3.2 (1.78, 5.69)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Health care providers should tell pregnant women to quit smoking tobacco</td>
<td>89 (75)</td>
<td>107 (77)</td>
<td>0.8 (0.45, 1.40)</td>
<td>0.423</td>
</tr>
<tr>
<td>Health care providers should tell pregnant women to quit using alcohol and drugs</td>
<td>90 (77)</td>
<td>109 (78)</td>
<td>0.8 (0.40, 1.46)</td>
<td>0.404</td>
</tr>
</tbody>
</table>

* 2 smokers and 2 non-smokers did not answer any of the knowledge and attitude questions
** OR and p-value (Wald test) for agreement with each item for smokers relative to non-smokers after controlling for years at school, post-secondary education, parity and state, and adjusting for clustering
a: Smoking tobacco during pregnancy is not known to be associated with increased risk of high blood pressure
b: Local colloquial names (yarndi, gunja) for cannabis were used in the questionnaire
Table 2.4: Knowledge of risks and attitudes towards smoking tobacco during pregnancy among smokers who reported quitting during pregnancy and those who continued smoking, adjusted for confounders (n=149*)

<table>
<thead>
<tr>
<th>Knowledge of risks</th>
<th>Quit smoking (n=30)</th>
<th>Continued smoking (n=119)</th>
<th>Adjusted OR** (95% CI)</th>
<th>p-value**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking tobacco during pregnancy increases the risk of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscarriage (losing the baby)</td>
<td>25 (83)</td>
<td>63 (53)</td>
<td>3.6 (1.28, 9.87)</td>
<td>0.015</td>
</tr>
<tr>
<td>Low birth weight of baby</td>
<td>26 (87)</td>
<td>82 (69)</td>
<td>2.3 (0.76, 6.72)</td>
<td>0.140</td>
</tr>
<tr>
<td>Breathing problems and sickness in infant</td>
<td>28 (93)</td>
<td>79 (66)</td>
<td>4.7 (0.93, 23.93)</td>
<td>0.061</td>
</tr>
<tr>
<td>Mother having high blood pressure and increased heart ratea</td>
<td>23 (77)</td>
<td>64 (54)</td>
<td>2.4 (0.98, 5.80)</td>
<td>0.055</td>
</tr>
<tr>
<td>Behavioural problems in childhood</td>
<td>17 (57)</td>
<td>41 (35)</td>
<td>2.2 (0.94, 5.21)</td>
<td>0.067</td>
</tr>
<tr>
<td>Attitudes</td>
<td>Quit smoking (n=30)</td>
<td>Continued smoking (n=119)</td>
<td>Adjusted OR** (95% CI)</td>
<td>p-value**</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>It’s good to have a smaller baby</td>
<td>1 (3.5)</td>
<td>13 (11)</td>
<td>0.3 (0.04, 2.0)</td>
<td>0.203</td>
</tr>
<tr>
<td>I think my baby will be born healthy</td>
<td>27 (93)</td>
<td>97 (82)</td>
<td>3.4 (0.82, 14.08)</td>
<td>0.091</td>
</tr>
<tr>
<td>Light smoking does not cause harm to unborn babies</td>
<td>1 (3.3)</td>
<td>23 (19)</td>
<td>0.2 (0.03, 1.57)</td>
<td>0.128</td>
</tr>
<tr>
<td>Stopping smoking increases the chance of having a healthy baby</td>
<td>27 (90)</td>
<td>77 (65)</td>
<td>3.3 (1.03, 10.33)</td>
<td>0.045</td>
</tr>
<tr>
<td>If you are around a lot of smoke from other people you might as well keep smoking yourself</td>
<td>9 (30)</td>
<td>41 (34)</td>
<td>0.8 (0.33, 1.79)</td>
<td>0.545</td>
</tr>
<tr>
<td>It’s OK to drink alcohol when you’re pregnant as long as you don’t drink a lot</td>
<td>2 (6.7)</td>
<td>20 (17)</td>
<td>0.4 (0.08, 1.68)</td>
<td>0.195</td>
</tr>
<tr>
<td>Quitting smoking is just too hard. It’s not worth the effort</td>
<td>0 (0)</td>
<td>25 (21)</td>
<td>-</td>
<td>0.005***</td>
</tr>
<tr>
<td>Statement</td>
<td>Quit smoking (n=30)</td>
<td>Continued smoking (n=119)</td>
<td>Adjusted OR** (95% CI)</td>
<td>p-value**</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>----------------------</td>
<td>---------------------------</td>
<td>------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Cannabis(^b) is OK when you’re pregnant because it’s natural</td>
<td>0 (0)</td>
<td>8 (6.8)</td>
<td>-</td>
<td>0.135***</td>
</tr>
<tr>
<td>It’s harder to quit smoking during pregnancy because of all the worries</td>
<td>2 (6.7)</td>
<td>60 (50)</td>
<td>0.07 (0.02, 0.36)</td>
<td>0.001</td>
</tr>
<tr>
<td>You’ve got to die of something. So why give up the things you enjoy?</td>
<td>2 (6.7)</td>
<td>24 (20)</td>
<td>0.4 (0.08, 1.50)</td>
<td>0.160</td>
</tr>
<tr>
<td>Women will try to give up smoking and drinking for their children even if they won’t try for themselves</td>
<td>15 (50)</td>
<td>61 (51)</td>
<td>0.8 (0.35, 1.87)</td>
<td>0.616</td>
</tr>
<tr>
<td>In our community it’s OK to smoke when you are pregnant</td>
<td>3 (10)</td>
<td>29 (25)</td>
<td>0.3 (0.09, 0.90)</td>
<td>0.032</td>
</tr>
<tr>
<td>Most women have bigger problems to deal with than trying to quit smoking and drinking</td>
<td>4 (13)</td>
<td>47 (40)</td>
<td>0.3 (0.07, 0.96)</td>
<td>0.044</td>
</tr>
<tr>
<td></td>
<td>Quit smoking (n=30)</td>
<td>Continued smoking (n=119)</td>
<td>Adjusted OR** (95% CI)</td>
<td>p-value**</td>
</tr>
<tr>
<td>-----------------------------------------------------------------</td>
<td>---------------------</td>
<td>---------------------------</td>
<td>------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>n (%): Health care providers should tell pregnant women to</td>
<td>Agree n (%)</td>
<td>Agree n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>quit smoking tobacco</td>
<td>28 (93)</td>
<td>89 (75)</td>
<td>3.9 (0.59, 25.64)</td>
<td>0.158</td>
</tr>
<tr>
<td>Health care providers should tell pregnant women to</td>
<td>28 (93)</td>
<td>90 (77)</td>
<td>3.1 (0.37, 26.89)</td>
<td>0.294</td>
</tr>
<tr>
<td>quit using alcohol and drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 2 of the continuing smokers did not answer any of the knowledge and attitude questions

** OR and p-value (Wald test) for agreement with each item for quitters relative to continuing smokers after controlling for years at school, post-secondary education, parity and state, and adjusting for clustering

*** p-value for univariate Pearson’s chi-squared test as logistic regression analysis not possible as smoking status predicts response to this item perfectly

a: Smoking tobacco during pregnancy is not known to be associated with increased risk of high blood pressure
b: Local colloquial names (yarndi, gunja) for cannabis were used in the questionnaire
Quitters and continuing smokers

Table 2.4 presents a similar comparison of knowledge and attitudes by reported quitting status, among women who smoked at the beginning of pregnancy. For the variables related to knowledge of risk, there were large differences between the groups, but this difference was only significant at the 5% level for miscarriage. This is likely due to the small numbers and low power for these analyses. Only 63 (53%) of the women who continued to smoke agreed that smoking increased the risk of miscarriage, compared to 83% of women who quit smoking. In relation to the attitudinal items, there were a number of significant differences, all of which were also significantly different between smokers and non-smokers. Only one item which was significant in the smoker/non-smoker comparison did not differ between quitters and continuing smokers – “You’ve got to die of something. So why give up the things you enjoy”. However, the lack of significance was likely due to the small sample size.

Discussion

The results indicate that the majority of women reported attempting to reduce the harms associated with smoking during pregnancy by either quitting smoking completely or reducing the amount smoked. Non-smokers were more educated and of lower parity than continuing smokers. They also had better understanding of the risks associated with smoking, and were less likely to express attitudes which indicated that quitting was very difficult, given the other challenges they faced, including the worries associated with pregnancy (e.g. “quitting smoking is just too hard. It’s not worth the effort”; “Most women have bigger problems to deal with than trying to quit smoking...”). Disturbingly, a small proportion of women reported increasing the amount they smoked during their pregnancy.

A North Queensland study with pregnant Indigenous women found no differences in risk knowledge between smokers and non-smokers, with differences on only one attitudinal item27. They also found no differences in education or parity by smoking status, but had a smaller sample, limiting their ability to detect differences. The reasons for the differences in findings between their study and our own are unclear,
but may include that our participants were younger, less educated and drawn from a broader population (two jurisdictions, including rural and remote communities) with different knowledge and attitudes to a North Queensland city.

Knowledge of risks associated with antenatal smoking was poorer among women who continued to smoke than among non-smokers, despite controlling for education, parity and state. A study with pregnant women in 13 Hungarian cities found a high prevalence of smoking (51%) and a strong association between knowledge of risk and continued smoking\textsuperscript{28}. Differences in perception of risk between pregnant smokers and non-smokers have been demonstrated in a range of populations\textsuperscript{29-31}. Previous research with Indigenous people has indicated that despite wide recognition that smoking is bad for your health, knowledge of specific risks is poor\textsuperscript{23,32,33}, including among pregnant women\textsuperscript{9,34}. In our study, the majority of women smoking at the beginning of pregnancy reported taking steps to reduce the associated harm to their foetus. Providing additional information on specific risks from smoking and the benefits of quitting may help motivate more women to quit smoking altogether. A parallel study with clinicians providing antenatal care to Indigenous women also identified gaps in knowledge of risks, particularly in relation to ongoing problems in childhood\textsuperscript{35}. Development of appropriate resources for use by antenatal providers may assist them to better explain the risks associated with antenatal smoking. Mass media messages addressing the harms of smoking during pregnancy would reinforce provider messages and raise awareness of these risks in the broader Indigenous community\textsuperscript{8,16}.

There is a wealth of literature indicating that disadvantaged women and those experiencing stressful lives have higher rates of smoking\textsuperscript{36-38} and are less likely to quit while pregnant\textsuperscript{39-45}. A socio-economic gradient in smoking among Indigenous people\textsuperscript{46}, including pregnant Indigenous women\textsuperscript{15,47}, is also recognised. Similar to our own findings, a study among low income pregnant women in the United States found that, compared to continuing smokers, those who quit were more likely to disagree with the statement, “Too many other problems in life to stop smoking”, and to
perceive a greater risk to the foetus. Gilligan et al. identified high levels of daily stress as an independent predictor of continuing smoking among Indigenous women. The responses to the attitudinal variables related to stress in our study suggest that women who continue to smoke are experiencing stressful situations which make quitting smoking “just too hard”. This is borne out in other studies among Indigenous people, in which stress is cited as a contributor to smoking and a major impediment to quitting, including among pregnant women. These stressors include high rates of unemployment and consequent poverty, overcrowded homes, violence, relationship difficulties, impacts of colonisation, and grief and loss, with many of these issues exacerbated by a new pregnancy. These high levels of stress may account for the increases in smoking reported by some women. Addressing underlying stressors in conjunction with smoking cessation support is likely to improve cessation outcomes. At a minimum, this should include both emotional and practical support through sensitive inquiry about potential stressors, acknowledgement that these problems make quitting difficult, assistance with identified issues, and referral to other services as appropriate. Strategies shown to be successful with other low income pregnant and non-pregnant women should be evaluated with Indigenous women. These include skills training in coping strategies and problem solving, and support groups incorporating education, social support, relaxation and other stress reduction techniques. Approaches that address multiple psychosocial and behavioural problems in an integrated and culturally sensitive approach, tailored to an individual woman’s need, and using a combination of emotional and practical support, skills training, and psychological therapies, may yield the greatest benefit.

A number of limitations should be considered in interpreting our findings. Firstly, we relied on self-reported smoking status. Under-reporting of smoking is likely, due to social desirability bias. Secondly, the smaller than anticipated sample limited our ability to detect any but large differences, particularly in comparisons between women who quit smoking and those who continued. In both jurisdictions, recruitment was stopped due to timing constraints. Thirdly, presenting respondents with a list of possible risks may overestimate their level of knowledge, as women may want to
appear knowledgeable and, if uncertain, err on the side of indicating agreement. Nonetheless, this approach enabled us to detect differences between smokers and non-smokers. Finally, in a cross-sectional survey any associations found cannot be considered causal. It is possible that the responses reflect a rationalisation by the respondents to explain their behaviour. Future longitudinal research would allow better understanding of the importance of the differences detected. However, an important strength of the study was the high response rate.

Conclusions

Increasing awareness of the risks of antenatal smoking and the benefits of quitting may help motivate women to attempt to quit smoking, and increase community support for these quit attempts. Given that level of education was significantly associated with smoking status, this will need to be addressed in both non-school and school environments. However, knowledge alone is unlikely to be sufficient, considering the difficult and stressful life circumstances experienced by many Indigenous women. Addressing the social environment and daily stressors they face, particularly those exacerbated by pregnancy, is critical to supporting quit attempts. In the longer term, addressing the social determinants of health, including school retention, housing and employment, is required.
References


PAPER THREE

Tobacco, alcohol and cannabis use during pregnancy: clustering of risks

Use of alcohol and cannabis are higher among people who smoke tobacco than among people who do not, with this pattern recognised among both Indigenous and non-Indigenous Australians. While antenatal tobacco smoking is collected and reported in the National Perinatal Dataset, use of other substances is not consistently collected. Consequently, little is known about the patterns of use of alcohol and cannabis during pregnancy, the factors associated with their use, or the interaction between tobacco smoking and use of other substances. This information is important in understanding the potential role these other substances play in acting as a barrier to smoking cessation.

Paper Three uses data from a survey with pregnant Aboriginal and Torres Strait Islander women in New South Wales and the Northern Territory. The paper presents an analysis of women’s self-reported use of tobacco, cannabis and alcohol, changes in use during pregnancy, and the factors associated with use of one or more substances. This paper has been accepted for publication in Drug and Alcohol Dependence and is available online as a preprint version (Appendix 1.3).

Tobacco, alcohol and cannabis use during pregnancy: clustering of risks

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Abstract

Background

Antenatal substance use poses significant risks to the unborn child. We examined use of tobacco, alcohol and cannabis among pregnant Aboriginal and Torres Strait Islander women, and compared characteristics of women by the number of substances reported.

Methods

A cross-sectional survey with 257 pregnant Indigenous women attending antenatal services in two states of Australia. Women self-reported tobacco, alcohol and cannabis use (current use, ever use, changes during pregnancy); age of initiation of each substance; demographic and obstetric characteristics.

Results

Nearly half the women (120; 47% (95% CI: 40%, 53%) reported no current substance use; 119 reported current tobacco (46%; 95% CI: 40%, 53%), 53 (21%; 95% CI: 16%, 26%) current alcohol and 38 (15%; 95% CI: 11%, 20%) current cannabis use. Among 148 women smoking tobacco at the beginning of pregnancy, 29 (20%; 95% CI: 14%, 27%) reported quitting, with 80 of 133 (60%; 95% CI: 51%, 69%) women quitting alcohol and 25 of 63 (40%; 95% CI: 28%, 53%) women quitting cannabis. Among 137 women reporting current substance use, 77 (56%; 95% CI: 47%, 65%) reported one and 60 (44%; 95% CI: 35%, 53%) reported two or three. Women using any one substance were significantly more likely to also use others. Factors independently associated with current use of multiple substances were years of schooling and age of initiating tobacco.

Conclusions

While many women discontinue substance use when becoming pregnant, there is clustering of risk among a small group of disadvantaged women. Programs should address risks holistically within the social realities of women’s lives, rather than focusing on individual tobacco smoking. Preventing uptake of substance use is critical.
Keywords: Indigenous, Aboriginal and Torres Strait Islander, prenatal care, prevention, Australia, tobacco
Introduction

Antenatal substance use is associated with significant risks to the unborn child. Smoking tobacco increases the risk of low birth weight (LBW), pre-term birth, intrauterine growth retardation (IUGR) and perinatal death. Alcohol is teratogenic, and use during pregnancy may result in foetal alcohol syndrome as well as LBW, pre-term birth and perinatal death. While less well-established, smoking cannabis is associated with adverse outcomes, including LBW, pre-term birth, IUGR and admission to the neonatal intensive care unit. Antenatal exposure to any of these substances is also related to adverse child behavioural and cognitive outcomes, including Attention Deficit Hyperactivity Disorder, increased externalising behaviour and decreased cognitive function.

In Australia, pregnant Aboriginal and Torres Strait Islander (hereafter referred to as Indigenous) women are more likely to smoke tobacco than non-Indigenous pregnant women, with 50% of Indigenous women reporting smoking antenatally. Smoking rates are also elevated among pregnant Indigenous women in Canada, New Zealand and the United States. National data on antenatal alcohol and cannabis use are not available; however, nearly one third of Indigenous Australian women aged 15 to 45 years report alcohol consumption at risky levels, and one in ten used cannabis in the last 12 months. Studies among pregnant Indigenous Australian women have identified rates of alcohol consumption between nine and 38%, and cannabis use between nine and 12%. High rates of substance use among Indigenous peoples have been attributed to social and historical factors, including socio-economic disadvantage, marginalisation, impacts of colonisation, and grief and loss. Associations between use of these substances are well-recognised. Alcohol consumption is associated with higher rates of tobacco and cannabis smoking and lower rates of smoking cessation. Similarly, the prevalence of tobacco smoking is higher among cannabis smokers, including among Indigenous Australians. Studies among pregnant women have examined relationships between use of tobacco and illicit drugs or alcohol, but few have specifically explored concurrent use of...
tobacco, alcohol and cannabis. Dutch women using cannabis in early pregnancy were more likely to use alcohol and tobacco during early pregnancy and continue to smoke tobacco\textsuperscript{20}. Among pregnant Danish women, alcohol intake was associated with tobacco smoking, but too few women used cannabis to allow statistical testing\textsuperscript{21}. English and Spanish studies have also found associations between antenatal use of cannabis, alcohol and tobacco\textsuperscript{22,23}.

We identified only two studies exploring concurrent use of alcohol, tobacco and cannabis among pregnant Indigenous women. The Western Australian Aboriginal Child Health Survey interviewed mothers of children aged 0 to 17 years about substance use during their pregnancy, and reported high rates of use (tobacco 49%, alcohol 23% and cannabis 9%), with women using one substance also more likely to use others\textsuperscript{11}. A study among Canadian Inuit women reports high rates of use of each substance and strong associations between alcohol consumption and use of tobacco and cannabis\textsuperscript{24}. Given the significant harm associated with antenatal use of these substances and the high rates of use among non-pregnant Indigenous Australian women, better understanding of use during pregnancy is important in developing appropriate programs to reduce the associated harms and improve birth outcomes.

\textit{Aims}

This paper:

- examines self-reported and concurrent use of tobacco, alcohol and cannabis among pregnant Indigenous women
- compares characteristics of women by the number of current substances reported.

\textit{Methods}

Cross-sectional surveys with pregnant Indigenous women were undertaken in the Northern Territory (NT) and New South Wales (NSW). The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW to enhance cultural security.
Recruitment

Settings

22 of 28 Aboriginal Maternal and Infant Health Strategy (AMIHS) teams providing antenatal care in community settings agreed to participate (Appendices 4.3, 4.4, 4.5.1,). From July to December 2009, eligible women receiving antenatal care at these sites were invited to participate by the midwife or Aboriginal Health Worker. Aboriginal Health Workers are health professionals who work in a range of roles within the health system to facilitate engagement between Indigenous Australians and the health system. Each site was asked to recruit five to 20 consecutive women, proportional to the number who received antenatal care in the previous year. A female Aboriginal research assistant recruited eligible women from the antenatal clinic of a major hospital from July to September 2010 and April to June 2011 (Appendix 5.6).

Client sample

Women were eligible if pregnant and if they or their partner were Indigenous. They were excluded if they were aged less than 16, being treated for mental illness, or unable to provide informed consent. The staff explained the study and provided eligible women with information sheets (Appendices 4.5.2 and 5.7). Written consent was obtained (Appendices 4.6 and 5.8). Recruitment staff offered assistance to complete the questionnaire (Appendices 4.8 and 5.9) if required. Staff completed a recruitment log to track participation rates but did not collect data on non-participants.

Questionnaire development and contents

The questionnaire development is described in detail elsewhere\textsuperscript{25}. In brief, it involved initial review of published literature on substance use during pregnancy and/or among Aboriginal peoples to develop the draft questionnaire. This was critically reviewed by the CRG and colleagues experienced in Aboriginal health research, tobacco control and questionnaire design, to assess face and content validity, reduce redundancy and refine the wording to ensure cultural appropriateness. Minor revisions included removal of some redundant questions and addition of others. The revised questionnaire was pilot-tested with 15 pregnant Aboriginal women in NSW and...
Western Australia. The CRG discussed feedback from these women, with further minor changes.

The final questionnaire had a grade 6 Flesch-Kincaid reading level and took 15–20 minutes to complete. The items relevant to this paper covered:

- **Demographic and obstetric characteristics:** age, education, if the pregnancy was planned, gestation, parity, and number of antenatal visits
- **Tobacco smoking status and changes during pregnancy:** smoking status – current daily smoker, current occasional smoker, ex-smoker or never smoked. Current and ex-smokers were asked the age they started smoking, and changes to their smoking status since becoming pregnant
- **Cannabis smoking status and changes during pregnancy:** the same questions as for tobacco
- **Alcohol consumption and changes during pregnancy:** any alcohol in the previous month (never, only once, 2 to 4 times in the month, 2 to 3 times a week, or ≥4 times a week). Current and ex-drinkers were asked the age they started drinking and changes to drinking status in pregnancy.

**Statistical analysis**

Summary statistics of respondent characteristics were obtained. Age, years of school, parity and gestation were categorised, and the number and percentage in each category reported. The numbers of antenatal visits are presented as medians due to non-normal distributions.

For each substance (tobacco, alcohol, cannabis), women were classified as current users, having quit during pregnancy, having quit prior to pregnancy, or never having used the substance, based on self-report. Women were also categorised as currently using zero, one, or two to three substances. Proportions in each category are presented with 95% confidence intervals (CI). The age at which they reported initiating use of each substance was categorised into <15 years, ≥15 years or never.
Two-way tables were generated for each combination of substances. Odds ratios and exact 95% confidence intervals were generated to assess associations between use of one substance and use of each of the others, as well as between quitting one substance during pregnancy, and quitting each of the others.

Univariate associations of demographic and obstetric variables with number of substances currently used (0, 1, ≥2) were examined using Pearson’s chi-square test for categorical explanatory variables and the non-parametric Kruskal-Wallis test for continuous variables. Multinomial logistic regression was used to determine associations between explanatory variables and the number of substances used, adjusting for clustering by site. Initially, all variables with a \( p \)-value <0.25 in the univariate analyses were included in the model. Wald tests, adjusted for clustering of women within sites, were used to test the significance of each parameter estimate, with stepwise removal of variables with a \( p \)-value ≥0.1. Jurisdiction (state/territory) was retained regardless of statistical significance, as the differences in social context between jurisdictions were considered important.

We aimed to recruit 400 women but only recruited 264 within the study period. This sample allowed estimation of the prevalence of current substance use with 95% confidence intervals within ±6% of the point estimate. Assuming that approximately a third of women would be in each of the three substance use categories (0, 1, ≥2), and with a design effect of 1.2, the study would be able to detect differences between groups of slightly more than 20%.

**Ethical approval**

The study was approved by the Human Research Ethics Committees of the University of Newcastle, Hunter New England Health, the Aboriginal Health & Medical Research Council, NT Department of Human Services, and Menzies School of Health Research (Appendices 4.2 and 5.1).
Results

At the hospital, 137 women were invited, and 107 (78%) consented. At community sites, 157 women consented. Of these, 128 were from the 15 sites which returned participation records documenting the number of women approached and consenting. These sites had invited 146 women, giving a response rate of 88%. The remaining seven sites returned 29 questionnaires but no participation records; thus, the consent rate is unknown for these sites. Of the 264 questionnaires returned, 257 had data on current use of all three substances and are used in this analysis.

The women had a median age of 23 years. Only 45 (18%) had completed year 12 at school (the final year of secondary school in Australia), with 75 (30%) not completing year 10. The majority (189, 77%) were greater than 20 weeks gestation, with 8% in their first trimester, 35% in their second trimester and the remaining 56% in their third trimester, although gestational age was missing for 11 women. Eighty-two (32%) were primiparous, and 73 (29%) reported that the pregnancy was planned.

Self-reported use of tobacco, alcohol and cannabis

Current use

Almost half the women (120 (47%; 95% CI: 40%, 53%)) reported no substance use at the time of the survey. Tobacco was the most commonly reported substance currently used, with 119 (46%; 95% CI: 40%, 53%) women smoking tobacco, 53 (21%; 95% CI: 16%, 26%) drinking alcohol and 38 (15%; 95% CI: 11%, 20%) smoking cannabis. Women currently smoking tobacco reported a mean of 10 cigarettes per day, while those currently smoking cannabis reported a mean of seven cones or joints per day.

Ever use

Tobacco was the most commonly reported substance ever used, with 162 (63%; 95% CI: 57%, 69%) women having smoked tobacco, 141 (55%; 95% CI: 49%, 61%) having drunk alcohol, and 84 (33%; 95% CI: 27%, 39%) having smoked cannabis at some time.
Quitting during pregnancy
Among 148 women smoking tobacco at the beginning of their pregnancy, 29 (20%; 95% CI: 14%, 27%) reported quitting prior to the survey, with corresponding figures being 80 of 133 (60%; 95% CI: 51%, 69%) women quitting alcohol and 25 of 63 (40%; 95% CI: 28%, 53%) women quitting cannabis.

Concurrent substance use
Of 137 women who reported currently using any tobacco, alcohol or cannabis, 77 (56%) used only one substance, while 60 (44%) used more than one. Figure 3.1 shows the number of women reporting current use of each substance. Seven distinct groups were identified.

**Figure 3.1:** Self-reported current substance use
(NB: Cells with fewer than 5 participants have been combined, consistent with ethical requirement to not present results which may allow identification of individuals)
No substances
120 women (47%) reported no current substances. Among these women, 64 (53%) had used one or more substances previously, with 24 (20%) quitting tobacco, 44 (37%) quitting alcohol and 12 (10%) quitting cannabis since becoming pregnant; 20 (17%), 11 (9%) and 10 (8%) had quit tobacco, alcohol and cannabis respectively, prior to becoming pregnant. Thirteen of these women reported being in their first trimester.

Tobacco only
60 women (23%) reported current tobacco use only, with 26 (43%) of these having quit alcohol and seven (12%) having quit cannabis since becoming pregnant. Two of these women were in their first trimester.

Alcohol only
13 women (5%) reported currently consuming alcohol only. One woman was in her first trimester.

Cannabis only
Five women (2%) reported only smoking cannabis. None of these women was in the first trimester.

Tobacco and alcohol only
26 women (10%) reported current tobacco and alcohol use but not cannabis use. Two of these women were in their first trimester.

Tobacco and cannabis only
20 women (8%) reported smoking both tobacco and cannabis but not consuming alcohol. None of these women was in the first trimester.

Tobacco, alcohol and cannabis
13 women (5%) reported current use of all three substances. Two of these women were in their first trimester.

Only 18 (13%) women who did not currently smoke tobacco reported use of any other substance, compared to 59 (50%) women who smoked tobacco. Current tobacco
smokers had higher odds of reporting current alcohol consumption (OR: 4.32; 95% CI: 2.12, 9.13) and cannabis use (OR: 10.21; 95% CI: 3.73, 34.52) than women who didn’t report current tobacco smoking. Women who reported alcohol consumption also had higher odds of reporting cannabis use than those who did not currently consume alcohol (OR: 2.69; 95% CI: 1.17, 5.97).

Women who reported quitting tobacco since becoming pregnant had higher odds of also having quit alcohol (OR: 5.32; 95% CI: 1.52, 23.36) and cannabis (OR: 12.69; 95% CI: 1.19, 617.8) than women who had not quit tobacco. Similarly, women who quit alcohol had higher odds of also reporting quitting cannabis (OR: 3.7; 95% CI: 0.93, 15.8) than women who had not quit drinking ($\chi^2=4.51, p=0.034$)

**Characteristics of women by current number of substances reported**

One hundred and twenty women (47%; 95% CI: 40%, 53%) reported no current substances, while 77 (30%; 95% CI: 24%, 36%) reported one and 60 (23%; 95% CI: 18%, 29%) reported two or three. Characteristics of women by number of substances currently used are shown in Table 3.1. Jurisdiction of residence, years of schooling, post-secondary education (vocational training and/or university), and number of antenatal visits with a doctor were all significantly associated with number of substances. Starting to use tobacco, alcohol or cannabis when younger than age 15 were each significantly associated with number of substances currently used.
Table 3.1: Characteristics of respondents by level of reported current substance use (n=257)

<table>
<thead>
<tr>
<th></th>
<th>No substances</th>
<th>1 substance</th>
<th>2-3 substances</th>
<th>( p )-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 120</td>
<td>n = 77</td>
<td>n = 60</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
</tr>
<tr>
<td>Jurisdiction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>64 (53%)</td>
<td>46 (60%)</td>
<td>46 (77%)</td>
<td>0.010</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>56 (47%)</td>
<td>31 (40%)</td>
<td>14 (23%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>30 (25%)</td>
<td>12 (16%)</td>
<td>13 (22%)</td>
<td>0.497</td>
</tr>
<tr>
<td>20 – 29</td>
<td>62 (52%)</td>
<td>47 (61%)</td>
<td>36 (60%)</td>
<td></td>
</tr>
<tr>
<td>≥ 30</td>
<td>28 (23%)</td>
<td>18 (23%)</td>
<td>11 (18%)</td>
<td></td>
</tr>
<tr>
<td>Highest year at school&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>25 (22%)</td>
<td>19 (25%)</td>
<td>31 (53%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>10 – 11</td>
<td>62 (53%)</td>
<td>43 (57%)</td>
<td>25 (42%)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>29 (25%)</td>
<td>13 (17%)</td>
<td>3 (5.1%)</td>
<td></td>
</tr>
<tr>
<td>Post-secondary education</td>
<td>58 (48%)</td>
<td>33 (43%)</td>
<td>15 (25%)</td>
<td>0.011</td>
</tr>
<tr>
<td>Planned pregnancy&lt;sup&gt;a&lt;/sup&gt;</td>
<td>37 (32%)</td>
<td>23 (32%)</td>
<td>13 (22%)</td>
<td>0.372</td>
</tr>
<tr>
<td>Gestation: ≤20 weeks&lt;sup&gt;a&lt;/sup&gt;</td>
<td>24 (21%)</td>
<td>17 (23%)</td>
<td>16 (28%)</td>
<td>0.630</td>
</tr>
<tr>
<td>Primiparous</td>
<td>47 (39%)</td>
<td>21 (27%)</td>
<td>14 (23%)</td>
<td>0.058</td>
</tr>
<tr>
<td>Age started smoking tobacco&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 15</td>
<td>13 (11)</td>
<td>15 (20)</td>
<td>37 (65)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥ 15</td>
<td>27 (24)</td>
<td>51 (68)</td>
<td>19 (33)</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>75 (65)</td>
<td>9 (12)</td>
<td>1 (1.8)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Chi-square analysis.
<table>
<thead>
<tr>
<th>Age started drinking alcohol</th>
<th>No substances</th>
<th>1 substance</th>
<th>2-3 substances</th>
<th>p-value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 120</td>
<td>n = 77</td>
<td>n = 60</td>
<td></td>
</tr>
<tr>
<td>&lt; 15</td>
<td>8 (6.7)</td>
<td>9 (12)</td>
<td>21 (36)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥ 15</td>
<td>45 (38)</td>
<td>34 (44)</td>
<td>24 (41)</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>67 (56)</td>
<td>34 (44)</td>
<td>13 (22)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age started smoking cannabis&lt;sup&gt;a&lt;/sup&gt;</th>
<th>No substances</th>
<th>1 substance</th>
<th>2-3 substances</th>
<th>p-value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 120</td>
<td>n = 77</td>
<td>n = 60</td>
<td></td>
</tr>
<tr>
<td>&lt; 15</td>
<td>9 (7.6)</td>
<td>5 (6.5)</td>
<td>19 (32)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>≥ 15</td>
<td>12 (10)</td>
<td>15 (20)</td>
<td>24 (41)</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>98 (82)</td>
<td>57 (74)</td>
<td>16 (27)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antenatal doctor visits&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Median(Q1, Q3)</th>
<th>Median(Q1, Q3)</th>
<th>Median(Q1, Q3)</th>
<th>Median(Q1, Q3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenatal midwife visits&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4 (2,6)</td>
<td>4 (2,6)</td>
<td>3 (1,5)</td>
<td>0.007</td>
</tr>
</tbody>
</table>

<sup>a</sup> Missing data – school years=7; planned pregnancy=8; gestation=9; antenatal doctor visits=17; antenatal midwife visits=22; age started smoking tobacco=10; age started drinking alcohol=2; age started smoking cannabis=2

<sup>b</sup> p-value for Pearson’s chi-squared test for categorical variables; non-parametric Kruskal-Wallis test for continuous explanatory variables in which the median is presented
Table 3.2: Multinomial model of associations with number of current substances reported, with no substances as the reference group (n=240)

<table>
<thead>
<tr>
<th></th>
<th>1 substance</th>
<th>p-value&lt;sup&gt;c&lt;/sup&gt;</th>
<th>2-3 substances</th>
<th>p-value&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>95% CI</td>
<td>OR</td>
<td>95% CI</td>
</tr>
<tr>
<td><strong>Jurisdiction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Territory&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.88</td>
<td>0.398, 1.932</td>
<td>1.42</td>
<td>0.510, 3.941</td>
</tr>
<tr>
<td>NSW</td>
<td>0.745</td>
<td>0.330, 2.252</td>
<td>0.12</td>
<td>0.018, 0.772</td>
</tr>
<tr>
<td>Highest year at school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.93</td>
<td>0.395, 2.182</td>
<td>0.33</td>
<td>0.116, 0.933</td>
</tr>
<tr>
<td>10 – 11</td>
<td>0.76</td>
<td>0.342, 1.697</td>
<td>0.12</td>
<td>0.018, 0.772</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>0.12</td>
<td>0.018, 0.772</td>
</tr>
<tr>
<td>Age started smoking tobacco</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 15&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.56</td>
<td>0.663, 3.646</td>
<td>0.30</td>
<td>0.124, 0.710</td>
</tr>
<tr>
<td>≥ 15</td>
<td>1.697</td>
<td>0.342, 1.697</td>
<td>0.12</td>
<td>0.018, 0.772</td>
</tr>
<tr>
<td>Never</td>
<td>0.11</td>
<td>0.032, 0.361</td>
<td>0.01</td>
<td>0.001, 0.053</td>
</tr>
</tbody>
</table>

<sup>a</sup> 17 women had data missing on at least one of the included variables
<sup>b</sup> Reference category
<sup>c</sup> Variables with p-value<0.05 from the Wald test are shown in bold
Factors associated with the number of substances currently used

Multinomial logistic regression was used to identify factors independently associated with the number of different substances currently used by women, with “No substances” as the reference group (Table 3.2). Never having started smoking tobacco was the only variable significantly associated with current use of one substance, relative to use of none. For current use of two or more substances, number of years of schooling and age of initiating tobacco use were significant. Among women who had 10 or 11 years of high school education, the odds of using two or more substances was one-third that for women who had less than 10 years schooling, and for women who had completed year 12, the odds were 0.12, relative to those with less than 10 years. Women who started smoking tobacco at age 15 or more had odds of reporting two or more substances approximately one-third that of women who started smoking before turning 15. Women who had never smoked tobacco had extremely low odds (OR=0.01, 95% CI: 0.001, 0.053) of currently using two or more substances.

Discussion

This paper is the first we are aware of to explore concurrent use of tobacco, alcohol and cannabis during pregnancy among Indigenous Australian women. Nearly half the women reported currently not using any of these substances, and many had quit at least one substance since becoming pregnant. However, over half reported current use of at least one substance, with tobacco the most common (46%), followed by alcohol (21%) and cannabis (15%). A small proportion of these women were in their first trimester and may subsequently have ceased use of these substances. The rates reported here are consistent with other studies\textsuperscript{5,10-12}. We identified significant concurrent use, such that women currently using any one substance were significantly more likely to also be using others. Many women reported quitting these substances since becoming pregnant, with both a greater number (80) and a greater proportion (60%) of those using alcohol at the beginning of their pregnancy reporting quitting, than those smoking tobacco (29 women; 20%) or cannabis (25 women; 40%) at the beginning. There was a strong association between quitting one substance and quitting others. Finally, while the majority of women currently used either no substance, 5% used one substance, 37% used two substances, and 50% used three substances.
substances or only one, those reporting multiple substances were characterised by other risks, including low educational achievement, early initiation of substance use and fewer antenatal visits.

Our findings highlight several fundamental issues for policy and clinical practice: clustering of risks among a disadvantaged sub-set of women, and the need to address risks holistically within the social realities of women’s lives; concurrent use of substances and the need to address these substances together; and the importance of prevention and addressing the social determinants of health.

**Clustering of risks and the need to address them holistically**

Traditionally, policy and service delivery have targeted individual risks such as tobacco, while neglecting consideration of clustering of risks and interactions between risks. This failure to address risk modification holistically limits our ability to address the complexity of risk behaviour within the context of people’s lives and may contribute to disparities in risk behaviour and health outcomes. This is exemplified by the case of antenatal tobacco smoking, where guidelines recommend a 5As approach to advising women to quit smoking\textsuperscript{26,27} focusing on the individual woman, with little consideration of other substance use, or the social realities of many disadvantaged women’s lives.

A strong socio-economic gradient in smoking during pregnancy is well-documented\textsuperscript{28-30}, including among Indigenous Australians\textsuperscript{31}, and there is evidence that this gradient is related to psycho-social stressors\textsuperscript{28,32,33}. Several studies have demonstrated clustering of psycho-social and behavioural risks among disadvantaged pregnant women\textsuperscript{30,32,34,35}. Thus, women who continue to smoke during pregnancy are likely to also experience other risks, including other substance use, financial stress, domestic violence and depression, suggesting that a holistic approach to risk modification is required. In our study, women currently using multiple substances had less education and had initiated substance use at earlier ages than women not currently using any substance. Although we did not measure other socio-economic or psycho-social risks, it is likely that poorly educated women will experience other disadvantage, including unemployment, family poverty and housing stress, all of which are more common among Indigenous than
Among Indigenous Australians, stress is repeatedly cited as a major barrier to cessation, including among pregnant women. Factors contributing to the high prevalence of smoking among Indigenous Australians are similar to those for other disadvantaged groups; in addition to socio-economic disadvantage, poor housing, high unemployment, and associated social problems, many people are surrounded by other smokers, increasing cigarette availability, providing frequent smoking cues and “normalising” smoking. For Indigenous Australians, other factors include experiences of racism, a history of grief and loss associated with colonisation and its aftermath, and the importance of smoking in maintaining relationships within community social networks. Among pregnant Indigenous women, poor knowledge of risks of antenatal smoking, high levels of stress and partner smoking are associated with continued smoking. Failure to acknowledge these environmental contributors to antenatal smoking has resulted in programs focusing on the individual woman, while providing little support to address household or community smoking, or to provide individuals with resources and skills to deal with these problems.

**Concurrent substance use**

In our study the most commonly reported drug was tobacco, with 46% of women currently smoking. Among these women, 50% reported current use of cannabis and/or alcohol, compared to only 13% of women who didn’t smoke tobacco. Continued tobacco smoking is therefore a potentially useful indicator of possible other drug use. Recent Canadian research also identified heavy smoking as a marker for other lifestyle risk factors including substance use. Thus, assessment of smoking status helps identify women (tobacco smokers) for whom more careful assessment of alcohol and cannabis use should be undertaken, and who may need additional support to address these and other risks.

**Prevention**

Women who were not currently using any substance were better educated, and many had never initiated any substance use, while those who had, had tended to start later.
By contrast, those using multiple substances were less educated and had initiated substance use at younger ages. This suggests that preventing uptake of substance use, through measures which focus on the early years, is required. Supporting girls to stay in school and providing opportunities for positive engagement with society through improved educational, sporting and employment prospects are likely to yield considerable benefits.

**Limitations**

The results from this study need to be considered in light of its limitations. Due to the small sample size there is adequate power to detect only large differences between groups. Secondly, the study relies on self-report. It is likely that some women under-reported substance use due to social desirability bias and concerns about the consequences of admitting substance use, particularly cannabis, as it is illegal. However, previous studies have confirmed reasonable validity of self-report for tobacco use among pregnant Indigenous Australian women\(^42\). Nonetheless, some under-reporting is likely. Finally, we did not collect data on many socio-economic and psycho-social factors. Further research to identify characteristics of women most likely to use multiple substances and to experience other psycho-social risks is required. Longitudinal designs and larger sample size would enable better exploration of the relationships between these factors.

**Implications**

*For research*

While there is a substantial body of evidence demonstrating a correlation between socio-economic disadvantage, psycho-social stress, substance use and poor birth outcomes, only a small number of interventions specifically addressing multiple risks among disadvantaged pregnant women have been trialled\(^34,43\), and to date this issue has been largely neglected in health policy and practice. It is critical that interventions addressing multiple risks, including tobacco and other substances, be developed and tested in rigorously designed trials. These should be developed specifically for disadvantaged pregnant women, including Indigenous women, and include strategies to address social risks as well as substance use.
**For service delivery**

Antenatal services providing care for Indigenous women, or other disadvantaged groups, need to be aware of the complexity of tobacco smoking within the context of other psycho-social and behavioural risks, and the realities of women’s lives. In addition to assessing tobacco status, clinicians should explore use of other substances, particularly among tobacco smokers, and support women to quit multiple substances, if appropriate. This should happen as early as possible in the pregnancy to maximise benefits to the foetus. It may be possible within the antenatal setting, but may require partnerships with, or referral to, specialised drug and alcohol services. Antenatal providers should also identify other problems women face, and address these themselves or through referral, as these problems may impede women’s ability to address their substance use and may themselves pose a risk. In particular, smoking cessation should not just focus on the individual, but also on the woman’s partner, family and social environment, using a holistic approach consistent with Indigenous models of health and wellbeing\(^44\).

**Preventing the problem**

Greater focus on prevention through addressing the social determinants of poor health is required to reduce the number of women using substances at the beginning of their pregnancies. Community level interventions may also help shift attitudes to tobacco use and increase knowledge of risk\(^45\), thus shifting community norms related to tobacco use, and in the longer term reducing uptake. Current government initiatives to reduce Indigenous smoking through the health promotion roles of the Regional Tackling Smoking Teams\(^46\) may help in this regard.
References


Clinicians providing antenatal care for Aboriginal and Torres Strait Islander women have an important role in addressing smoking behaviour. A small body of research has explored issues related to Aboriginal Health Workers providing smoking cessation advice to their clients. However, there has been no research specifically exploring the knowledge and attitudes of clinicians providing antenatal care in relation to smoking and cessation during pregnancy, or their current behaviour regarding smoking cessation support. This information is critical in understanding the barriers to providing smoking cessation support and ways to improve the support provided to pregnant Indigenous women.

Paper Four presents data from a survey of clinicians providing antenatal care to pregnant Indigenous women in New South Wales and remote communities in the Northern Territory. It explores their knowledge and attitudes regarding smoking and cessation and the factors associated with self-reported assessment of women’s smoking status. This paper has been published in *BMC Public Health* (Appendix 1.4).

Knowledge, attitudes and other factors associated with assessment of tobacco smoking among pregnant Aboriginal women by health care providers: a cross-sectional survey

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2. School of Medicine and Public Health, Faculty of Health, University of Newcastle, David Maddison Building, King St, Newcastle, NSW 2300, Australia
Abstract

Background

As with many Indigenous peoples, smoking rates among Aboriginal Australians are considerably higher than those of the non-Indigenous population. Approximately 50% of Indigenous women smoke during pregnancy, a time when women are more motivated to quit. Antenatal care providers are potentially important change agents for reducing the harms associated with smoking; yet little is known about their knowledge, attitudes or skills, or the factors associated with providing smoking cessation advice.

Methods

This paper aimed to explore the knowledge and attitudes of health care providers caring for pregnant Australian Aboriginal women with regard to smoking risks and cessation, and to identify factors associated with self-reported assessment of smoking. A cross-sectional survey was undertaken with 127 staff providing antenatal care to Aboriginal women from two jurisdictions: the Northern Territory and New South Wales, Australia. Measures included respondents’ estimate of the prevalence of smoking among pregnant women, optimal and actual assessment of smoking status, knowledge of risks associated with antenatal smoking, knowledge of smoking cessation, attitudes to providing cessation advice to pregnant women, and perceived barriers to and motivators for cessation for pregnant women.

Results

The median provider estimate of the smoking prevalence was 69% (95% CI: 60, 70). The majority of respondents considered assessment of smoking status to be integral to antenatal care and a professional responsibility. Most (79%) indicated that they assess smoking status in 100% of clients. Knowledge of risks was generally good, but knowledge of cessation was poor. Factors independently associated with assessing smoking status among all women were employer service type ($p=0.025$), cessation knowledge score ($p=0.011$), and disagreeing with the statement that giving advice is not worth it given the low level of success ($p=0.011$).
Conclusions

Addressing knowledge of smoking risks and cessation counselling is a priority and should improve both confidence and ability, and increase the frequency and effectiveness of counselling. The health system must provide support to providers through appropriate policy and resourcing, to enable them to address this issue.
**Background**

Reducing smoking among Australia’s Indigenous people has been identified as a government priority in its efforts to “Close the Gap” between Indigenous and non-Indigenous life expectancy\(^1\). Approximately half the adult Indigenous population smokes, with similar rates for men and women\(^2\). Identified drivers of smoking among Indigenous Australians include a history of colonisation and dispossession, socio-economic disadvantage and marginalisation, acceptability and normalisation of smoking within Aboriginal social networks, and the role of tobacco in social exchange\(^3-7\).

Addressing tobacco smoking during pregnancy could bring significant health gains. Studies with pregnant Australian Indigenous women report smoking prevalence rates between 50% and 67\(^%\)\(^8-14\), approximately three times that in the non-Indigenous population\(^14\). Smoking during pregnancy is associated with increased risk of maternal and infant adverse outcomes. For the mother, these include higher rates of placental abruption, placenta praevia, premature labour and premature rupture of membranes\(^15,16\). For the baby, adverse outcomes include low birth weight, preterm birth, intra-uterine growth retardation, perinatal death and Sudden Infant Death Syndrome\(^15,16\). Examination of population-level data confirm these adverse outcomes among Aboriginal women\(^10\).

Pregnancy is considered a “teachable moment” – a time when women are more motivated to modify their behaviour than at other times\(^17\). Numerous studies in the general population have demonstrated high spontaneous quit rates, with additional women reducing the amount smoked\(^17-21\). There is also some evidence to support pregnancy as a “teachable moment” among Aboriginal women. A qualitative study with pregnant Aboriginal women from Western Australia found that a few women quit smoking when they became pregnant, but the majority preferred to try to reduce the number of cigarettes smoked, as quitting was too difficult and the benefits of smoking outweighed those of quitting\(^6\). A recent survey of pregnant Aboriginal women in New South Wales (NSW) and the Northern Territory (NT) found that 21% of women...
smoking at the beginning of their pregnancy reported quitting, while a further 46% reported reducing their smoking\textsuperscript{22}. However, smoking during pregnancy among Aboriginal women remains common, perinatal data indicate low quit rates\textsuperscript{13}, and audits have revealed gaps in provision of advice\textsuperscript{23}, suggesting that more could be done to capitalise on this opportunity.

Antenatal care providers see pregnant women multiple times throughout their pregnancy, with national data indicating that 77\% of Indigenous women attended for at least five antenatal visits\textsuperscript{24}. There is strong evidence that provision of smoking cessation counselling in the antenatal period is effective\textsuperscript{25}. In other populations, studies have confirmed that women consider provision of smoking cessation support within the antenatal clinic setting to be appropriate\textsuperscript{26-28}, that information on smoking is best provided by health professionals\textsuperscript{29}, and that this advice is an important factor in helping women quit smoking\textsuperscript{30}. However, the approach and manner of this advice are important\textsuperscript{31}.

Providers caring for pregnant Aboriginal women are thus potentially important change agents for addressing the harms associated with smoking. Assessment of client smoking is an essential first step in providing tailored cessation advice and support. Exploring the knowledge and views of providers on the value and effectiveness of addressing smoking with pregnant Aboriginal women and factors associated with provision of care will assist in determining the best approaches to optimising their effectiveness. To date, there have been no studies published on this topic.

**Aims**

This paper explores perceptions of health care providers who provide care to pregnant Aboriginal women regarding:

a. their estimate of the prevalence of smoking among Aboriginal women in their community
b. optimal and actual assessment of smoking status
Methods

A cross-sectional survey was undertaken with staff providing antenatal care from two jurisdictions: those working in remote medical services in the NT; and those providing care through the Aboriginal Maternal and Infant Health Strategy (AMIHS) in NSW. AMIHS teams are comprised of community midwives and Aboriginal Health Workers (AHWs) working together to provide outreach antenatal care for Aboriginal women in multiple sites across NSW. While both professionals work together, the midwives usually focus on the clinical aspects of antenatal care, and the AHWs address health education, community development and social needs. In the NT, staffing of remote clinics varies, with most clinics employing midwives or nurses to provide clinical aspects of antenatal care, and AHWs supporting clinical care and providing health education. Aboriginal Health Workers are a specific category of Australian health professional, working in both government health services and Aboriginal Community Controlled Health Organisations. They are usually members of the local community and work to help bridge the cultural gap between Aboriginal people and the western medical system.

A community reference group (CRG) of Aboriginal women and service providers from rural NSW was formed to guide the study and ensure it was conducted in a culturally secure manner. The CRG provided input into the content and wording of the questionnaire, and interpretation of findings, and endorsed the reports and papers from the study.

Recruiting participants

Staff providing antenatal care to Aboriginal women in each jurisdiction were identified by the relevant health departments. Staff were eligible if they provided antenatal care to Aboriginal women as a part of their normal role. In the NT, the Department of
Health and Family (DHF) provided a list of staff working in remote medical services who potentially provided antenatal care (i.e. staff who were not specialists in another field such as mental health). The medical services were then contacted by the research team to establish which staff were actively involved in providing antenatal care, and these staff were considered eligible for the survey. In NSW, lists of AMIHS staff were provided by the AMIHS co-ordinator in each Area Health Service. All AMIHS staff were considered eligible for the survey as this is a specific program for provision of antenatal care to Aboriginal families. Eligible staff in both jurisdictions were sent invitation letters (Appendices 4.4 and 5.2), information sheets (Appendices 4.5.1 and 5.4) and self-completion questionnaires (Appendices 4.7 and 5.5). The staff included AHWs, midwives, nurses and doctors. They were asked to complete the anonymous questionnaires and return them in pre-paid envelopes. To maximise response rates and reduce bias, reminder letters (Appendix 5.3), with additional copies of the questionnaire and information sheet, were sent three weeks after the initial invitation and again a month later to all staff. Return of the questionnaire was considered to indicate implied consent. The study was conducted between September 2008 and July 2009.

**Questionnaire development and contents**

**Literature review**

Concepts included in the questionnaire were derived from a review of the published literature on knowledge and attitudes of clinicians to providing advice on smoking to pregnant women and the literature on substance use in pregnancy in general and specifically among Aboriginal peoples. Specific questions related to knowledge of risks and attitudes towards smoking during pregnancy were adapted from a questionnaire used with pregnant Aboriginal women. Additional questions derived from our research exploring the knowledge and attitudes of pregnant Aboriginal women were also included.
Consultation with experts

The draft questionnaire was critically reviewed by several groups with a view to assessing content validity, reducing redundancy and refining the wording of questions to ensure cultural appropriateness. These groups included the CRG, the NT DHF and colleagues of the authors who were experienced in Aboriginal health research, tobacco control and questionnaire design. Minor revisions were made to question order and wording, with removal of some redundant questions and addition of others.

Pilot testing

The revised questionnaire was pilot-tested with 12 service providers, including seven midwives and five AHWs in NSW and Western Australia, who provided additional comments. Further minor modifications were made to the wording of some questions in consultation with the CRG, prior to finalisation of the instrument.

The final questionnaire had a Flesch-Kincaid reading level of grade 9, and took approximately 15 minutes to complete. The items in the final questionnaire covered:

- estimated prevalence of smoking among pregnant and non-pregnant women in the local community
- the perceived percentage of pregnant women that should be assessed for smoking with optimal care, and the percentage actually assessed
- knowledge of smoking cessation and of risks associated with smoking during pregnancy
- attitudes to providing advice to pregnant women
- perceived barriers and motivators to smoking cessation for pregnant women
- respondents’ ethnicity, gender, position and their own smoking status (current daily smoker, current occasional smoker, ex-smoker and never-smoker).

Questions related to knowledge and attitudes were presented as statements, and respondents were asked to indicate their agreement on a four-point Likert scale (strongly agree to strongly disagree), with the addition of a “not sure” option for the knowledge questions.
**Statistical methods**

The questionnaires were designed to be computer-scannable. Data were analysed using Stata 9.2. Summary statistics of respondent characteristics were obtained. Due to the non-normal distribution, respondents’ estimates of prevalence of smoking among Aboriginal women are presented as medians with 95% confidence intervals. Responses to the questions about optimal and actual assessment of smoking were dichotomised into “100% of women” or “fewer than 100% of women”. These classifications were used as they were considered to be a proxy for whether or not the respondent included assessment of smoking as a core part of routine antenatal care, or as an optional element. Responses to knowledge questions were dichotomised to “correct” or “incorrect”, with “not sure” classified as incorrect. The number and percentage correct are presented. Knowledge scores were generated as the sum of the correct responses for knowledge of risk and of cessation separately. Responses to attitude questions were dichotomised to “agree” or “disagree”, and the number and percentage of respondents agreeing with the statements presented.

Univariate associations with reported assessment of smoking status were examined using the Fisher’s exact chi-square test for categorical explanatory variables and the non-parametric Mann-Whitney test for continuous explanatory variables. Multivariable logistic regression was used to determine which factors were associated with self-reported assessment of smoking status for all clients when adjusted for confounders. Initially, all variables with a \( p \)-value <0.25 in the univariate analyses and cell size \( \geq 4 \) were included in the model, with stepwise removal of variables based on the \( p \)-value from the likelihood ratio test, with variables with a \( p \)-value <0.1 retained in the model. Jurisdiction was retained in the model regardless of statistical significance, as the differences in social context and service delivery between jurisdictions were considered important. Records with missing data for relevant variables were excluded from the multivariable analysis.

Based on initial information provided by the NT DHF and the NSW AMIHS program, we anticipated that there would be 260 eligible service providers across both jurisdictions,
and with a response rate of 70% there would be 182 respondents. This would allow an estimate of the proportion of providers who assess 100% of women with 95% confidence interval within ±7% of the point estimate if at least 60% of providers reported assessing 100% of women. It would also allow detection of differences in characteristics between providers who do and those who do not assess smoking status of 100% of pregnant women, of 22% or more with 80% power and 5% significance level.

**Ethical approval**

The NT survey was approved by the Human Research Ethics Committees of the University of Newcastle, the Northern Territory Department of Human Services and the Menzies School of Health Research (Appendix 5.1). The NSW survey was approved by the University of Newcastle, Hunter New England, and the Aboriginal Health & Medical Research Council Human Research Ethics Committees (Appendix 4.2).

**Results**

**Respondent characteristics**

In total, 184 eligible providers were identified, of whom 127 (69%) responded to the survey. Of these 33 (26%) were Aboriginal, 30 (24%) were AHWs, 89 (70%) were midwives or nurses and eight were doctors (5%), with the majority (n=96; 76%) employed in government services and the remainder in Aboriginal Community Controlled Health Services. Nineteen respondents (15%) reported being current smokers, with smoking significantly more common among the AHWs (34%) than others (9.4%) (OR=5.1; 95% CI 1.8, 14.2).

**Estimated prevalence of smoking**

The median estimate of the prevalence of smoking among pregnant Aboriginal women was 69% (95% CI: 60, 70). The median clinician estimate of the prevalence of smoking among pregnant women was slightly but non-significantly lower than that for non-pregnant women in the community (75%; 95% CI: 70, 80).
Optimal and actual assessment of client smoking status

The majority of respondents (n=103; 86%) indicated that “with optimal care” they should know the smoking status of all their clients, with 96 (79%) indicating that they “actually ask” the smoking status of all their clients. Those who indicated that with optimal care they should know the smoking status of all clients were significantly more likely to claim they asked all clients (p<0.001). Further univariate analyses revealed that current smokers, AHWs and staff employed by a community-controlled organisation were significantly less likely to report assessing the smoking status of all their clients, relative to non-smokers, other health professionals and those employed by government services respectively (Table 4.1). There were no differences in self-reported assessment by jurisdiction.

Table 4.1: Socio-demographic characteristics of providers by self-reported assessment of tobacco smoking (n=122)

<table>
<thead>
<tr>
<th></th>
<th>Provider assesses 100% of women&lt;sup&gt;a&lt;/sup&gt; (n = 96)</th>
<th>Provider assesses fewer than 100% of women&lt;sup&gt;a&lt;/sup&gt; (n = 26)</th>
<th>p-value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jurisdiction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>54 (56)</td>
<td>11 (42)</td>
<td>0.269</td>
</tr>
<tr>
<td>NT</td>
<td>42 (44)</td>
<td>15 (58)</td>
<td></td>
</tr>
<tr>
<td><strong>Smoking status – current</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>11 (12)</td>
<td>8 (32)</td>
<td>0.026</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>84 (88)</td>
<td>17 (68)</td>
<td></td>
</tr>
<tr>
<td><strong>Position</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHW</td>
<td>16 (17)</td>
<td>11 (42)</td>
<td>0.008</td>
</tr>
<tr>
<td>Midwife/Nurse/Dr</td>
<td>80 (83)</td>
<td>15 (58)</td>
<td></td>
</tr>
<tr>
<td><strong>Service</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community-controlled</td>
<td>16 (17)</td>
<td>11 (42)</td>
<td>0.008</td>
</tr>
<tr>
<td>Government</td>
<td>80 (83)</td>
<td>15 (58)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> 5 missing values on question asking about actual assessment of smoking status  
<sup>b</sup> Fisher’s exact test
Knowledge of risks associated with smoking during pregnancy and of smoking cessation

Respondents’ knowledge of smoking-related risks was high (see Table 4.2), although the majority incorrectly indicated that smoking increased the risk of maternal pre-eclampsia. Two respondents did not agree that smoking increased the risk of low birth weight, both of whom reported not always assessing smoking status. There were no other significant differences in knowledge of risks or the total knowledge of risk score between those who did and did not report assessing smoking among all their clients.

The majority of respondents considered that gradual reduction was an effective method of smoking cessation (n=92 (75%)), while only 61 (50%) thought that stopping suddenly and completely was effective. Correct responses did not differ significantly by reported assessment of smoking status among clients (Table 4.2). Recognition that nicotine replacement therapy (NRT) could be used in pregnancy was significantly associated with reported assessment, as was the total smoking cessation score.

Table 4.2: Knowledge of risks and of smoking cessation, by self-reported assessment of tobacco smoking

<table>
<thead>
<tr>
<th>Provider assesses 100% of women (n = 96)</th>
<th>Provider assesses fewer than 100% of women (n = 26)</th>
<th>p-value(^a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct n (%)</td>
<td>Correct n (%)</td>
<td></td>
</tr>
<tr>
<td>Smoking during pregnancy increases the risk of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscarriage (losing the baby)</td>
<td>90 (94)</td>
<td>21 (81)</td>
</tr>
<tr>
<td>Low birth weight of baby</td>
<td>96 (100)</td>
<td>24 (92)</td>
</tr>
<tr>
<td>Breathing problems and sickness in infant</td>
<td>93 (97)</td>
<td>25 (96)</td>
</tr>
<tr>
<td></td>
<td>Provider assesses 100% of women (n = 96)</td>
<td>Provider assesses fewer than 100% of women (n = 26)</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Mother having high blood pressure and increased heart rate (pre-eclampsia)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3 (3)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Behavioural problems in childhood</td>
<td>55 (57)</td>
<td>13 (50)</td>
</tr>
<tr>
<td><strong>Total knowledge of risk score (median (Q1,Q3))</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4 (3, 4)</td>
<td>3.5 (3, 4)</td>
</tr>
<tr>
<td><strong>Knowledge of cessation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicotine replacement therapy (patches, gum, etc) can help women quit</td>
<td>85 (89)</td>
<td>20 (77)</td>
</tr>
<tr>
<td>Nicotine replacement therapy shouldn’t be used in pregnancy</td>
<td>71 (74)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>An effective way to quit during pregnancy is to just stop altogether, right away</td>
<td>48 (50)</td>
<td>13 (50)</td>
</tr>
<tr>
<td>An effective way to quit during pregnancy is to reduce by 1 to 2 cigarettes each day&lt;sup&gt;c&lt;/sup&gt;</td>
<td>26 (27)</td>
<td>4 (15)</td>
</tr>
<tr>
<td><strong>Total knowledge of smoking cessation score (median( Q1,Q3))</strong></td>
<td>2 (2, 3)</td>
<td>2 (1, 2)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Fisher’s exact test, except for knowledge scores which used the non-parametric Mann-Whitney test

<sup>b</sup> Smoking during pregnancy is not associated with increased risk of pre-eclampsia<sup>16</sup>

<sup>c</sup> Gradual reduction alone has not been shown to be an effective strategy for smoking cessation in pregnancy<sup>25</sup> and is not recommended in Australian national guidelines on managing smoking in pregnancy<sup>41</sup>
Attitudes to providing advice and perceptions of barriers and enablers to quitting

The majority of respondents agreed with statements that advising women to quit smoking was one of the main things they could do to help women have healthy babies, and that it was a service responsibility to do so, with no difference by assessment status (Table 4.3). There were also no differences by assessment status in the proportion indicating that helping women quit smoking made them feel proud of their role or that the Aboriginal community saw this as a priority. However, there were significant differences on several other attitudinal variables, with those who don’t assess all women more likely to agree that advising women to quit smoking was not worth it given the low success rate; that they didn’t have the skills; that other risks faced by women were greater; that they didn’t want to push women away from antenatal care; and that smoking was the woman’s choice and not their responsibility. There were no significant differences by assessment status for any of the listed barriers or motivators for quitting (Table 4.3).
<table>
<thead>
<tr>
<th>Attitudes to advising pregnant women to quit smoking</th>
<th>Provider assesses 100% of women (n = 96)</th>
<th>Provider assesses fewer than 100% of women (n = 26)</th>
<th>p-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is one of the main things that can be done to help women have healthy babies</td>
<td>91 (95)</td>
<td>24 (92)</td>
<td>0.640</td>
</tr>
<tr>
<td>Giving advice about smoking to these women is not worth it given the small level of success</td>
<td>4 (4)</td>
<td>11 (42)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>My health service has a responsibility to encourage pregnant women to quit</td>
<td>94 (98)</td>
<td>24 (96)</td>
<td>0.504</td>
</tr>
<tr>
<td>I’d like to give anti-smoking advice but I don’t have the skills</td>
<td>14 (15)</td>
<td>12 (48)</td>
<td>0.001</td>
</tr>
<tr>
<td>The harms of smoking in pregnancy are minor compared with other risks women face</td>
<td>8 (8)</td>
<td>8 (32)</td>
<td>0.005</td>
</tr>
<tr>
<td>I don’t want to push women away from antenatal care by telling them to quit smoking</td>
<td>17 (18)</td>
<td>13 (52)</td>
<td>0.001</td>
</tr>
<tr>
<td>It’s an individual choice. It’s not up to me to tell a woman to quit smoking</td>
<td>4 (4)</td>
<td>6 (24)</td>
<td>0.005</td>
</tr>
<tr>
<td>Our Aboriginal community sees helping pregnant women quit smoking as a high priority</td>
<td>55 (58)</td>
<td>15 (65)</td>
<td>0.638</td>
</tr>
<tr>
<td>Helping women quit smoking makes me feel proud of my role</td>
<td>78 (82)</td>
<td>18 (82)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived barriers and motivators to smoking cessation</th>
<th>Strongly agree/Agree n (%)</th>
<th>Strongly agree/Agree n (%)</th>
<th>p-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy is a time when most women are more motivated to quit than usual</td>
<td>74 (77)</td>
<td>22 (92)</td>
<td>0.155</td>
</tr>
</tbody>
</table>

<sup>a</sup> Calculated using Fisher’s exact test for all comparisons.
<table>
<thead>
<tr>
<th>Provider assesses 100% of women (n = 96)</th>
<th>Provider assesses fewer than 100% of women (n = 26)</th>
<th>p-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree/Agree n (%)</td>
<td>Strongly agree/Agree n (%)</td>
<td></td>
</tr>
<tr>
<td>It’s harder to quit during pregnancy than other times</td>
<td>18 (19)</td>
<td>6 (26)</td>
</tr>
<tr>
<td>There is no point in stopping smoking late in pregnancy</td>
<td>3 (3)</td>
<td>3 (12)</td>
</tr>
<tr>
<td>Women will try to quit for their children even if they won’t try for themselves</td>
<td>72 (76)</td>
<td>18 (75)</td>
</tr>
<tr>
<td>Women who smoke cannabis find it harder to quit tobacco</td>
<td>66 (71)</td>
<td>14 (61)</td>
</tr>
<tr>
<td>Women smoke to bury their pain</td>
<td>59 (63)</td>
<td>14 (56)</td>
</tr>
<tr>
<td>Women smoke to suppress their emotions</td>
<td>61 (66)</td>
<td>16 (64)</td>
</tr>
<tr>
<td>Most women who quit in pregnancy, start again when the baby is born</td>
<td>67 (71)</td>
<td>17 (74)</td>
</tr>
</tbody>
</table>

N.B. up to 6 missing responses for some variables
<sup>a</sup> Fisher’s exact test

**Factors independently associated with assessment of smoking status**

Logistic regression identified three variables which were independently and significantly associated with increased odds of self-reported assessment of smoking status, controlling for jurisdiction: working for a government health service; higher smoking cessation knowledge score; and disagreeing with the statement that giving advice is not worth it given the low level of success. Three other variables, although not significant at the 5% level, were significant at the 10% level and also retained in the model: smoking status; and disagreeing with the statements, “I’d like to give smoking cessation advice but I don’t have the skills” and “I don’t want to push women away from antenatal care by telling them to quit smoking” (Table 4.4).
Table 4.4: Multivariable model of associations with assessing 100% of women for smoking status

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jurisdiction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>2.487</td>
<td>0.681, 9.080</td>
<td>0.168</td>
</tr>
<tr>
<td>NT *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Smoking status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current smoker</td>
<td>0.244</td>
<td>0.054, 1.103</td>
<td>0.067</td>
</tr>
<tr>
<td>Current non-smoker *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community-controlled</td>
<td>0.183</td>
<td>0.041, 0.811</td>
<td>0.025</td>
</tr>
<tr>
<td>Government *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking cessation knowledge score</td>
<td>1.757</td>
<td>0.985, 3.135</td>
<td>0.011</td>
</tr>
<tr>
<td><strong>Giving advice about smoking to these women is not worth it given the small level of success</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.095</td>
<td>0.015, 0.590</td>
<td>0.011</td>
</tr>
<tr>
<td>Disagree *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I’d like to give anti-smoking advice but I don’t have the skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.285</td>
<td>0.078, 1.041</td>
<td>0.057</td>
</tr>
<tr>
<td>Disagree *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don’t want to push women away from antenatal care by telling them to quit smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.330</td>
<td>0.094, 1.159</td>
<td>0.084</td>
</tr>
<tr>
<td>Disagree *</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Reference category
Discussion

In this study we found that better smoking cessation knowledge, a positive attitude towards providing cessation advice and being employed by a government health service were significantly associated with higher rates of self-reported assessment of smoking status while providing antenatal care to pregnant Aboriginal women. There is some indication that being a non-smoker, and disagreeing with statements expressing concern that women would be pushed away from antenatal care or about having inadequate skills, were also associated with higher rates of assessment, but these relationships were not statistically significant at the 5% level.

To our knowledge, this is the first study to specifically explore the knowledge and attitudes regarding smoking among service providers caring for pregnant Aboriginal women in Australia. The study was undertaken in two jurisdictions among antenatal care providers in remote, regional and urban Australian settings. The number of eligible providers was less than anticipated, and the consequent small sample may have limited our ability to identify other significant associations. However, the response rate was good, and the sample is likely to represent this group of service providers reasonably well.

Consistent with studies among other antenatal care providers, the majority of respondents considered that assessing smoking status of all women was integral to good antenatal care and a professional and service responsibility. The majority also indicated that they do ask all women about their smoking. However, over one-fifth reported not always asking all women, indicating a missed opportunity for addressing a major preventable risk factor for adverse birth outcomes. While there may be over-estimation of rates of assessment due to social desirability bias, the positive attitudes expressed by the majority of respondents are an asset with potential to be enhanced by training and skills development.

In general, knowledge of risks associated with smoking was high, particularly in relation to birth outcomes and infant illness, but not for childhood health problems.
An earlier study of Australian directors of antenatal clinics identified poor specific knowledge of risks. Others have reported that providers did not consider smoking a serious risk to infant health. The uncertainty regarding risks of ongoing problems in childhood indicates gaps in knowledge and lost opportunities for conveying the true burden of antenatal smoking. As provider knowledge of risk is essential for conveying clear messages regarding risk to women, education of providers regarding the specific risks associated with smoking is essential.

Knowledge of smoking cessation was poor and inversely associated with level of assessment. Only half the respondents recognised that complete and sudden cessation was an effective quitting method, three-quarters incorrectly indicated that gradual reduction was effective, and one-third incorrectly indicated that NRT shouldn’t be used in pregnancy, despite national guidelines stating that NRT can be used in pregnancy. Other studies have also identified a preference among antenatal providers for advising reduction rather than complete cessation. Smoking cessation interventions are poorly covered in nursing curricula and in training for Aboriginal Health Workers, which may explain the low level of knowledge and that approximately one-fifth felt they didn’t have the skills to provide advice. Perceived skill level is associated with provision of tobacco interventions, and lack of skills has repeatedly been identified as a barrier to smoking cessation counselling by practitioners. In our study, both knowledge scores and perceptions of skills were related to level of smoking assessment, suggesting that provision of culturally appropriate, pregnancy-specific training and resources would increase confidence and skills and consequently assessment and management of antenatal smoking.

Although only a small proportion of respondents agreed that giving advice was not worth it, this perception was strongly associated with level of reported assessment, suggesting that pessimism regarding the impact of advice may contribute to non-assessment of smoking status. Pessimism about the effectiveness of interventions has been identified as a barrier to providing cessation counselling in other Australian antenatal settings and internationally. The poor knowledge of smoking
cessation identified is likely to contribute to low efficacy of any advice provided, further contributing to a perception that advising cessation is futile. Within the context of providing care to women with multiple complex care needs with constrained resources, providers who anticipate low success rates may prioritise other activities which are easier to implement or have greater chance of success.

Provider smoking has been shown to be negatively associated with smoking cessation counselling, and smoking is perceived to be a barrier to providing cessation counselling among Aboriginal Health Workers. Several studies have suggested assisting AHWs to quit in order to increase their comfort in providing cessation support. Although only 19 (15%) of the respondents smoked, provision of smoking cessation support to those who do is likely to be beneficial for the individuals, enhance their willingness to provide cessation supports, and give them personal experience in quitting.

One-quarter of the respondents indicated concern that providing advice might push women away, and this was associated with lower smoking assessment, although this was not significant at the 5% level in the multivariable analysis. In a Western Australian study of smoking during pregnancy, AHWs expressed discomfort about raising smoking as they wished to maintain positive relationships with women. Similar concerns have been identified in other studies with AHWs, although they report feeling more comfortable discussing smoking with pregnant smokers than with other smokers. In other antenatal settings, a perception that clients are not interested or do not expect advice has been identified as a barrier, and midwives have expressed concern about potentially damaging their relationship with women if they address their smoking. By contrast, women consider provision of smoking cessation advice within antenatal care to be acceptable, and state that it doesn’t affect their relationships with their midwives. However, the manner of providing care is important, and should not be authoritarian. Greater community and provider understanding of the real risks of smoking and benefits of cessation may
increase community support and help providers feel more comfortable addressing smoking.

Limitations to this research should be considered in interpreting the findings. In addition to the small sample size and potential social desirability bias mentioned above, the cross-sectional nature of the survey prevents assessment of causality in the relationship between assessment and the knowledge and attitudinal variables. Factors other than the knowledge and attitudinal variables included in our study may be determining respondents’ smoking cessation activities, and the reported attitudes may then reflect a rationalisation on the part of respondents to justify their behaviour. Trials of interventions that aim to address knowledge and attitudes would be beneficial in assessing this. A further limitation is that the study did not assess the amount or type of advice that the clinicians provide to women.

**Conclusions**

This study has identified factors constraining the provision of evidence-based antenatal care in relation to tobacco use, but has also found strengths on which to build. The majority of providers recognised that smoking increases the risk of adverse outcomes, considered that giving cessation advice was important, and believed that providing advice was their responsibility. The majority reported assessing all women for smoking and saw it as part of optimal antenatal care.

The poor knowledge of providers regarding smoking cessation reinforces the call from others for development of culturally appropriate training and resources for providers caring for Aboriginal peoples\textsuperscript{5,47,55,60}, including those specific to pregnancy\textsuperscript{6,61}. Addressing knowledge of risks and smoking cessation counselling among antenatal providers is a priority and should improve both confidence and ability, and increase the frequency and effectiveness of counselling. Programs designed to support pregnant women to quit smoking need to address the many drivers of smoking, including high levels of stress and disadvantage, and social norms of smoking\textsuperscript{4-7}. Additionally, the health system must provide support to providers through appropriate
policy and resourcing, to enable them to address this issue. Recent government initiatives in Indigenous smoking are likely to raise recognition of the importance of addressing smoking at every opportunity and should be accompanied by broader efforts to address Indigenous disadvantage.
References


The survey with clinicians reported in Paper Four found that the majority of clinicians report routinely assessing all women for their smoking status. However, it is possible that the clinicians surveyed may have over-reported their assessment of smoking status due to a bias towards reporting socially expected behaviours. It is therefore important to confirm the clinician reports by asking pregnant Aboriginal and Torres Strait Islander women about their experience of receiving smoking cessation assessment and advice.

Paper Five is a brief paper providing additional information from the surveys with pregnant Indigenous women in New South Wales and the Northern Territory. It presents their reported experience of being assessed for smoking status, being advised to quit smoking and being offered support to achieve this. It also assesses factors associated with this care. This paper has not been published, but is currently under editorial review.
Antenatal smoking cessation support reported by pregnant Aboriginal and Torres Strait Islander women

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Abstract

Background

Guidelines recommend assessment of smoking status, with advice and support for smoking cessation, as a routine and integral part of antenatal care. Approximately 50% of pregnant Aboriginal and Torres Strait Islander women smoke through pregnancy, a rate which is three times that of other pregnant Australian women.

Findings

Surveys among 261 pregnant Aboriginal and Torres Strait Islander women assessed pregnant women’s recollection of antenatal provider assessment, advice and support for smoking cessation. The majority of women (90%, 95% CI: 85%, 93%) reported being asked their smoking status, 81% (95% CI: 73%, 87%) of smokers reported being advised to stop smoking, and 62% (95% CI: 53%, 71%) of smokers were offered support to stop.

Conclusions

Despite most pregnant Aboriginal and Torres Strait Islander women who smoke being offered advice and support to quit, the persisting high prevalence of smoking suggests that the advice and support offered is insufficient to overcome the many factors pushing women to smoke. Improving the support provided to women will require empowering the antenatal providers with adequate skills, appropriate resources and effective interventions. Current guidelines are based on research from non-Indigenous populations, as there are no published effective interventions for Indigenous pregnant women. Trials of interventions designed specifically for pregnant Aboriginal and Torres Strait Islander women are urgently needed. While evidence of effective interventions with other disadvantaged groups of pregnant women may be useful to inform approaches for Aboriginal and Torres Strait Islander women, the lack of detail in many published studies impedes this. There is therefore a need for more detailed reporting of interventions to enable adaptation and implementation.
Introduction

Smoking rates among pregnant Aboriginal and Torres Strait Islander women are three times the rate of other pregnant Australian women, contributing to the disparity in birth and other health outcomes for Indigenous Australians\(^1\). Antenatal smoking increases the risk of numerous adverse outcomes for the mother and baby. Risks for the mother include premature labour, premature rupture of membranes, and placental abnormalities\(^2,3\). For the baby, the consequences can be even greater, with increased risk of perinatal death, low birth weight, preterm birth and sudden infant death syndrome\(^2,3\). Smoking is the single most important modifiable cause of adverse foetal outcomes in western countries, and consequently, addressing antenatal smoking is a critical component of antenatal care\(^4\). Guidelines recommend assessment of smoking status, with advice and support for smoking cessation, as a routine and integral part of antenatal care\(^5,6\).

There is evidence that despite guideline recommendations, provision of smoking cessation advice and support during antenatal care is sub-optimal. A recent review of studies assessing health care providers’ self-reported provision of antenatal smoking cessation care found that assessment of smoking status is common (73% to 100% in the 14 studies included)\(^7\). However, offers of support to achieve cessation are lower, ranging from 27% to 99% for assistance with quitting, and from 6% to 42% for arranging follow-up care\(^7\). Pregnant women also report receiving low rates of assessment and support. An Irish study found that 86% of women attending for their first antenatal visits reported being assessed for smoking, compared with only 18% of women attending for subsequent visits\(^8\). Among smokers, only 25% reported being advised to stop smoking\(^8\). Australian studies with pregnant women have reported reasonably high rates of assessment of smoking status (80% to 89%), with lower rates of advice to quit (37% to 75%) and advice on how to achieve cessation (22% to 65%)\(^9-11\). There have been no studies asking pregnant Aboriginal and Torres Strait Islander women about the advice and support they have received for smoking cessation for their antenatal providers.
**Aims**

To estimate the extent to which pregnant Aboriginal and Torres Strait Islander women report having their smoking status assessed and being offered advice and support for smoking cessation by their antenatal care providers.

**Methods**

This paper reports additional data from surveys with pregnant Aboriginal and Torres Strait Islander women in New South Wales (NSW) and the Northern Territory (NT), Australia. The detailed methods have been previously reported\(^{12,13}\). Briefly, pregnant Aboriginal and Torres Strait Islander women receiving antenatal care through community-based antenatal services and a large hospital antenatal clinic completed a questionnaire (Appendices 4.8 and 5.9) on use of tobacco and other substances during pregnancy. The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW to enhance cultural security. Ethical approval for the research was provided by the Human Research Ethics Committees of the University of Newcastle, Hunter New England Health, the Aboriginal Health & Medical Research Council, the NT Department of Human Services and the Menzies School of Health Research (Appendices 4.2 and 5.1).

Women were invited to participate by the antenatal team providing their care, or by a trained female Aboriginal research assistant (Appendices 4.5.2, 5.6 and 5.7). Women were eligible if they were pregnant and if they or their partner were Aboriginal and/or Torres Strait Islander, and were excluded if they were aged 16 years or less, were being treated for mental illness, or were unable to provide informed consent. All women provided written consent to participate (Appendices 4.6 and 5.8).

A draft questionnaire was developed based on a literature review of smoking during pregnancy and smoking among Indigenous people. The draft questionnaire was reviewed by the CRG and colleagues with expertise in Indigenous health research and questionnaire design. Following revisions, the questionnaire was pilot tested with pregnant Aboriginal and Torres Strait Islander women in Western Australia and NSW,
with further changes made in consultation with the CRG. The final questionnaire took approximately 15 to 20 minutes to complete and had a Flesch-Kincaid reading level of grade 6. Women were offered assistance to complete the questionnaire if desired. The questionnaire covered demographic and obstetric characteristics, self-reported substance use (tobacco, alcohol, cannabis), changes in substance use in pregnancy, knowledge of risks and attitudes to smoking in pregnancy and views on potential strategies to support pregnant women to quit smoking.

In this paper we report women’s responses to the questions:
1. Has your doctor, health worker or midwife asked you whether you smoke tobacco in this pregnancy? Response options were “Yes”, “No”, or “I don’t remember”.
   Women who smoked were then asked to answer two additional questions:
2. If you are a smoker, did they advise you to quit smoking during the pregnancy?
3. If you are a smoker, did they offer to support you to quit smoking during the pregnancy?
   For these two questions, the response options were “Yes”, “No”, “I don’t remember” or “I’m not a smoker”.

Data were analysed to calculate proportions and 95% confidence intervals (CI) for each response. Analysis for the latter two questions was restricted to those indicating they were smokers.

Results

In total, 264 women completed questionnaires. Response rates for the entire sample are not known as some sites recruiting women did not return their participation logs. Among those sites returning participation logs, the response rate was 88% in the community sites and 78% in the hospital antenatal clinic.

Of the 264 women completing the survey, 261 answered the questions reported here; of these, 120 were current smokers. The women had a median age of 23 years and a median gestation of 30 weeks, and 84 (32%) were primiparous. Only 46 (18%) had completed secondary school (year 12).
Responses to the questions related to assessment and support for smoking cessation are presented in Table 5.1. There were high levels of routine assessment (90%), with 81% of women reporting advice to quit but only 62% reporting offers of support to do so. There were no differences by age, education or parity, with the exception that women who were primiparous were more likely to report being offered support to quit (72%), compared with 59% of women of higher parity (p=0.025) (data not shown in table).

Table 5.1: Assessment of smoking status and advice and support for cessation reported by pregnant Indigenous women

<table>
<thead>
<tr>
<th>Asked about smoking status (n=261)</th>
<th>Advised to quit smoking (n=120)*</th>
<th>Offered support to quit smoking (n=119)**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%       (95% CI)</td>
</tr>
<tr>
<td>Yes</td>
<td>234</td>
<td>90% (85%, 93%)</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>7% (4%, 10%)</td>
</tr>
<tr>
<td>Don’t remember</td>
<td>10</td>
<td>4% (2%, 7%)</td>
</tr>
</tbody>
</table>

* Only includes current smokers
** One respondent did not answer this question

Discussion

The results suggest that the majority of Aboriginal and Torres Strait Islander women participating in these surveys were routinely assessed for their smoking status, and that advice to quit smoking and support to do so were offered to most smokers. The results are similar to those reported from a major metropolitan Australian hospital following an implementation strategy to enhance assessment and support for smoking cessation, in which approximately 75% of women reported being advised to quit smoking and 65% reported being offered support\(^{11}\). The rate of assessment is also similar to that reported from a state-wide survey in Victoria following a guideline
implementation program, in which 89% of women reported being asked their smoking status\textsuperscript{10}.

The high levels of assessment are to be expected, as smoking status of pregnant women is now routinely collected and reported in Australian national datasets\textsuperscript{14}, requiring providers to assess smoking status for all women. However, while guidelines recommend advising smokers to quit, with ongoing support\textsuperscript{5}, data on advice and support are not routinely collected.

The majority of smokers report being provided with advice and offers of support for cessation, although the quality of this advice and support cannot be ascertained from the very limited questions included in our survey. Previous surveys with antenatal providers caring for pregnant Aboriginal and Torres Strait Islander women have identified poor knowledge of smoking cessation, with some expressing low levels of confidence in their skills\textsuperscript{15}. There is also little evidence for effective approaches to supporting pregnant Indigenous women to quit smoking, with no successful trials yet published\textsuperscript{16}. The only published trial of a smoking cessation intervention specifically designed for pregnant Aboriginal and Torres Strait Islander women did not demonstrate a significant effect of the intervention\textsuperscript{17}. Thus, current antenatal smoking cessation guidelines are not specific to Aboriginal and Torres Strait Islander women, for whom the drivers of continued smoking, and the barriers to cessation, are particularly intense. These include a high prevalence of smoking within the household, numerous personal and social stressors, socio-economic disadvantage, low priority placed on smoking cessation relative to other issues, and use of other substances such as alcohol and cannabis\textsuperscript{12,13,16,18-20}. Rather, the guidelines are based on evidence from non-Indigenous populations, do not address the common barriers to cessation experienced by Aboriginal and Torres Strait Islander women, and do not address issues of cultural security in provision of care\textsuperscript{20,21}. Trials of smoking cessation support programs specifically designed to address the issues faced by Aboriginal and Torres Strait Islander women are therefore urgently needed.

Until evidence specific to Aboriginal and Torres Strait Islander women becomes available, adaptation of approaches successfully used with other disadvantaged groups
of pregnant women may assist providers and policy-makers to develop effective, evidence-informed approaches to support. However, a barrier to implementation of effective interventions is the lack of sufficiently detailed information usually reported in clinical trials. A recent review of the quality of reporting of smoking cessation trials for pregnant women identified clear gaps in the detail provided, with 77% of the trials not reporting the method of quit advice provided, 79% not providing details on training given, and 94% not reporting the type of care provided to women who relapsed\textsuperscript{22}. This lack of detail is clearly a significant impediment to implementation and translation of effective interventions into policy and practice.

Despite the majority of pregnant Aboriginal and Torres Strait Islander women who smoke being offered advice and support to quit, the persisting high prevalence of smoking suggests that the advice and support offered is insufficient to overcome the many factors pushing women to smoke. Improving the support provided to women will require empowering the antenatal providers with adequate skills, appropriate resources and effective interventions. Trials of interventions designed specifically for pregnant Aboriginal and Torres Strait Islander women are urgently needed. There is also a need for more detailed reporting of interventions with pregnant women to enable adaptation and implementation.
References


In developing new approaches or programs to support pregnant Aboriginal and Torres Strait Islander women to quit smoking, it is critical to have an understanding of the perceptions of both the key stakeholder groups – the pregnant women and their antenatal care providers – regarding different strategies. Some research in remote communities has previously explored community and provider preferences for different approaches to smoking cessation support for Aboriginal people, but this did not focus specifically on the unique situation of pregnancy.

Paper Six reports results from surveys with pregnant Indigenous women and their antenatal care providers in New South Wales and the Northern Territory, which asked respondents to indicate how helpful they thought each of a list of possible strategies would be. This paper has been accepted for publication in the *Maternal and Child Health Journal* and is available online as a preprint version (Appendix 1.5).

Supporting pregnant Aboriginal and Torres Strait Islander women to quit smoking: views of antenatal care providers and pregnant Indigenous women

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Abstract

Objectives

To assess support for 12 potential smoking cessation strategies among pregnant Australian Indigenous women and their antenatal care providers.

Methods

Cross-sectional surveys of staff and women in antenatal services providing care for Indigenous women in the Northern Territory and New South Wales, Australia. Respondents were asked to indicate the extent to which each of a list of possible strategies would be helpful in supporting pregnant Indigenous women to quit smoking.

Results

Current smokers (n=121) were less positive about the potential effectiveness of most of the 12 strategies than the providers (n=127). For example, family support was considered helpful by 64% of smokers and 91% of providers; between 56% and 62% of smokers considered advice and support from midwives, doctors or Aboriginal Health Workers likely to be helpful, compared to 85% to 90% of providers. Rewards for quitting were considered helpful by 63% of smokers and 56% of providers, with smokers rating them more highly and providers rating them lower than most other strategies. Quitline was least popular for both.

Conclusions

This study is the first to explore views of pregnant Australian Indigenous women and their antenatal care providers on strategies to support smoking cessation. It has identified strategies which are acceptable to both providers and Indigenous women, and therefore have potential for implementation in routine care. Further research to explore their feasibility in real-world settings, uptake by pregnant women and actual impact on smoking outcomes is urgently needed, given the high prevalence of smoking among pregnant Indigenous women.
**Introduction**

Tobacco smoking among pregnant Aboriginal and Torres Strait Islander women remains three times as common as among non-Indigenous Australian pregnant women, with approximately 50% of Indigenous women smoking during pregnancy\(^1\). Addressing this disparity is a priority for reducing the gap in health outcomes between Indigenous and non-Indigenous Australians. Disparities in smoking rates between Indigenous and non-Indigenous pregnant women are also marked in the United States, Canada and New Zealand\(^2-^4\). While interventions to reduce antenatal smoking are known to be effective in non-Indigenous populations\(^5\), to date effective interventions for pregnant Indigenous women have not been identified\(^6-^8\).

Previous reviews of interventions for smoking cessation in Indigenous peoples have concluded that approaches that specifically target Indigenous populations can be successful\(^9,^10\), and that interventions targeting individuals, such as counselling and nicotine replacement therapy (NRT), which are known to be effective in other populations, are likely to be effective for Indigenous people\(^11\). However, these reviews did not include trials with pregnant Indigenous women. A review of smoking cessation interventions specifically for pregnant Indigenous women identified only two relevant trials, neither of which increased cessation, highlighting the need for further research to identify effective strategies\(^8\). In addition to considering approaches found to work in other pregnant population groups, a useful starting point for developing interventions is an exploration of the views of pregnant Indigenous women and the staff providing their antenatal care.

**Aims**

To assess support for a range of potential smoking cessation program strategies among pregnant Indigenous women who currently smoke tobacco, pregnant ex-smokers, and their antenatal care providers.
Methods

Cross-sectional surveys with antenatal care providers and pregnant Indigenous women were undertaken in the Northern Territory (NT) and New South Wales (NSW). The project was guided by a community reference group (CRG) to ensure cultural security. The CRG was composed of Aboriginal women from the community (some of whom were pregnant), Aboriginal Health Workers (AHWs) and Community Midwives. Ethical approval for the research was provided by the Human Research Ethics Committees of the University of Newcastle, the NT Department of Human Services and Menzies School of Health Research, Hunter New England Health Service and the Aboriginal Health & Medical Research Council of NSW (Appendices 4.2 and 5.1).

Recruitment

The detailed methodology for both surveys is described elsewhere\textsuperscript{12,13}. A brief summary follows.

Staff survey

Briefly, staff providing antenatal care in remote medical services in the NT and through the Aboriginal Maternal and Infant Health Service (AMIHS) in NSW were eligible and were identified by their relevant health departments and services. All staff worked in community-based services. Between September 2008 and July 2009, eligible staff were sent invitation letters (Appendices 4.3, 4.4 and 5.2), information sheets (Appendices 4.5.1 and 5.4) and self-completion questionnaires (Appendices 4.7 and 5.5). They were asked to complete the anonymous questionnaires and return them in pre-paid envelopes. Reminder letters (Appendix 5.3) with additional copies of the documents were sent twice – three weeks after the initial invitation and again one month later. Return of the questionnaire was considered to imply consent.

Women’s survey

Women were recruited by the AMIHS teams from July to December 2009, and from the maternity outpatient clinic of a major hospital from July to September 2010 and April to June 2011. Women were eligible if pregnant and if they or their partner were
Indigenous. They were excluded if aged less than 16, being treated for mental illness, or unable to provide informed consent. Consecutive eligible women were invited to participate by the midwife, AHW or a female Aboriginal research assistant, who explained the study and provided women with information sheets (Appendices 4.5.2 and 5.7). Written consent was obtained (Appendices 4.6 and 5.8). Recruiting staff offered assistance to complete the questionnaire (Appendices 4.8 and 5.9) if required. Staff were asked to invite all eligible women to participate and to complete a recruitment log to track participation rates.

**Questionnaire development and contents**

Draft questionnaires were critically reviewed by the CRG and colleagues experienced in Indigenous health research and smoking cessation, to assess content validity, reduce redundancy and refine the wording to ensure cultural appropriateness. Minor revisions were made prior to pilot-testing with 12 antenatal service providers and 15 pregnant Indigenous women, in NSW and Western Australia. Further minor modifications were made in consultation with the CRG.

The final questionnaires had Flesch-Kincaid reading levels of grade 9 (staff) and grade 6 (women), and both took 15–20 minutes to complete. The questionnaires for staff and women differed with regard to some content, but, of relevance to this paper, both included a question on strategies. For staff, the wording was “Please indicate how useful you think each of the following would be in helping pregnant women quit smoking”. They were then presented with a list of 12 possible strategies, and asked to indicate if they considered them to be “very helpful”, “somewhat helpful”, “maybe helpful”, “not helpful” or “harmful”. The women were asked, “How useful do you think each of the following would be in helping pregnant women to quit smoking”, with the same list of strategies and response options. Additionally, both the staff and women’s questionnaires included a question on smoking status – current daily smoker, current occasional smoker, ex-smoker or never smoked. The women’s questionnaire also asked the usual number of cigarettes smoked each day, and their age, education, and parity.
Statistical analysis

Responses to the question on smoking status were categorised into current smokers (current daily or occasional smokers), ex-smokers or never smokers. Responses to the questions on the helpfulness of the strategies were dichotomised into “very or somewhat helpful” or “other”. For the women’s survey, only responses from smokers and ex-smokers were included in the analysis.

Summary statistics of respondent characteristics were obtained. For the women, mean age and number of cigarettes smoked were calculated. Years of school, and parity were categorised, and the number and percentage in each category reported. For the staff, the number and percentage for each profession was calculated.

The proportion of each group (women who were current smokers, ex-smokers and service providers) who considered each strategy “very or somewhat helpful” was calculated and 95% confidence intervals generated. We also assessed the proportions in each group indicating that each strategy was “maybe helpful”, “not helpful” or “harmful”.

Results

Description of the sample

In total, 264 women responded to the survey, of whom 121 were current smokers and 55 were ex-smokers and included in this analysis. The response rate could not be calculated as not all teams returned recruitment logs, but among the teams which did, the response rate was 88%. The majority of smokers (85, 70%) reported smoking every day, with the remaining 36 (30%) smoking occasionally. The smokers reported an average of 10 cigarettes per day. Other characteristics of the current smokers and ex-smokers are presented in Table 6.1.
Table 6.1: Characteristics of women who were current smokers (n=121) and ex-smokers (n=55)

<table>
<thead>
<tr>
<th></th>
<th>Current smokers n = 121</th>
<th>Ex-smokers n = 55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age: mean (standard deviation)</td>
<td>24.9 (5.69)</td>
<td>24.4 (6.02)</td>
</tr>
<tr>
<td>Completed year 12 at school: n (%)</td>
<td>14 (12)</td>
<td>10 (18)</td>
</tr>
<tr>
<td>Post-secondary education: n (%)</td>
<td>40 (33)</td>
<td>32 (58)</td>
</tr>
<tr>
<td>Primiparous: n (%)</td>
<td>29 (24)</td>
<td>21 (38)</td>
</tr>
</tbody>
</table>

127 of 184 (69%) eligible service providers responded, of whom 30 (24%) were AHWs, 89 (70%) were nurses or midwives, and eight (5%) were doctors. Nineteen (15%) reported being current smokers (10 AHWs (33%) and nine midwives (10%)).

Perceived helpfulness of suggested strategies

The numbers of participants indicating that they thought each strategy would be very or somewhat helpful for pregnant women in quitting smoking are shown in Table 6.2 and are presented in order of the proportion of current smokers indicating they thought the strategy would be helpful. Overall, a greater proportion of service providers were likely to consider each of the strategies helpful than the current smokers, with the ex-smokers generally between the providers and the current smokers. Four of the six strategies rated most highly by smokers (family support, advice and support from the midwife, doctor or AHW) were also in the top five supported strategies for ex-smokers and the top four for providers. Interestingly, rewards were the most popular strategy among ex-smokers (83%) and the second most popular with current smokers (63%) but equal tenth among providers (56%). Community activities were less supported by ex-smokers (51%) than by either current smokers (59%) or providers (74%). Access to Quitline was supported by less than 50% of respondents in all three groups. For each strategy, respondents who did not consider it likely to be helpful were split fairly evenly between “maybe helpful” and “not helpful”. The only strategies considered harmful by more than one person in any
group were free NRT, which was considered harmful by eight providers, five current smokers and one ex-smoker; and rewards for quitting, which were considered harmful by six providers, one current smoker and one ex-smoker (not shown in table).
Table 6.2: Proportion of respondents considering each strategy very or somewhat helpful among antenatal service providers, pregnant women who smoke and pregnant ex-smokers

<table>
<thead>
<tr>
<th>Strategy*†</th>
<th>Very or somewhat helpful</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for the whole family to help others quit</td>
<td>74</td>
</tr>
<tr>
<td>Rewards for women who stop smoking with vouchers to get things for the mother or baby</td>
<td>74</td>
</tr>
<tr>
<td>Advice and support from the midwife</td>
<td>74</td>
</tr>
<tr>
<td>Advice and support from the doctor</td>
<td>72</td>
</tr>
<tr>
<td>Community activities about quitting</td>
<td>68</td>
</tr>
<tr>
<td>Advice and support from the AHW</td>
<td>66</td>
</tr>
<tr>
<td>Free nicotine replacement therapy</td>
<td>66</td>
</tr>
<tr>
<td>Peer support groups</td>
<td>60</td>
</tr>
<tr>
<td>Brochures: harms of smoking and advice on quitting</td>
<td>61</td>
</tr>
<tr>
<td>Strategy*†</td>
<td>Very or somewhat helpful</td>
</tr>
<tr>
<td>-----------</td>
<td>--------------------------</td>
</tr>
<tr>
<td></td>
<td>Women</td>
</tr>
<tr>
<td></td>
<td>Current smokers</td>
</tr>
<tr>
<td>Stress management programs</td>
<td>57 49 (39, 58)</td>
</tr>
<tr>
<td>Support person</td>
<td>55 47 (38, 57)</td>
</tr>
<tr>
<td>Access to a Quitline</td>
<td>54 46 (37, 56)</td>
</tr>
</tbody>
</table>

* Ordered by proportion of current smokers perceiving strategies to be very or somewhat helpful
† 0-5 missing responses for each variable
Discussion

This paper is the first we are aware of that explores the degree to which pregnant Indigenous women and antenatal care providers consider particular strategies helpful for antenatal smoking cessation. In general, current smokers were least supportive of most strategies, and providers were most supportive. The majority of strategies were supported by over half the participants in each group. The reasons for the lower support among current smokers than among ex-smokers and providers on most strategies is not known, but may reflect their personal struggles with quitting and recognition of the difficulty of quitting, or a general sense of hopelessness regarding the prospects of success. While these results reflect the opinions of respondents, not the actual efficacy of strategies, establishing acceptability is a useful starting point for developing intervention trials.

Rewards for smoking cessation

A similar proportion of current smokers and providers considered rewards likely to be helpful (63.3% and 55.6% respectively), but a higher proportion of ex-smokers indicated they thought rewards would be helpful (83%), with rewards the most popular strategy in this group, second most popular among current smokers and equal tenth among providers.

The Cochrane review of antenatal smoking cessation interventions identified provision of incentives, or rewards, as the most effective intervention, with incentives reducing smoking by 24%, compared to 6% for all interventions combined. Incentives are considered most effective for simple, time-limited behaviours such as completing immunisation, but may be less effective where the required behaviour change is complex. For maintaining complex behaviour change, financial incentives may be a useful addition to multi-faceted programs that address the complex individual, social and economic factors affecting behaviour.

Incentives for antenatal smoking cessation are already used in some parts of the British NHS; yet their use for health behaviour change remains controversial. In a survey of pregnant Australian women, the majority did not support paying pregnant
smokers to quit, but smokers were more likely to do so\textsuperscript{17}. A qualitative study with social service staff and clients found that clients were supportive of rewards for quitting, while staff were less so, and expressed concerns about the feasibility of implementation\textsuperscript{18}. Our results add to this body of work, identifying significantly greater support for rewards among ex-smokers than among providers. Given the apparent efficacy of incentives in antenatal smoking cessation, further research is required to explore the reasons for the low support among providers, relative to their support for other strategies.

**Involving family**

The strategy rated highest by both current smokers and providers was “support for the whole family to help others quit”. Smokers who are supported by their partners are more likely to succeed, but a recent systematic review of interventions aimed at enhancing partner support to improve smoking cessation found little evidence for effective interventions\textsuperscript{19}. Family-based interventions have been recommended for Indigenous Australians because of the importance of family in influencing smoking behaviour\textsuperscript{20,21}. The endorsement by women and service providers in our study provides additional evidence for their acceptability and further support for their inclusion in future trials to assess their efficacy.

**Health professionals**

Advice and support from the range of health professionals were each rated reasonably highly by all groups. Good evidence exists for efficacy of advice from doctors and nurses\textsuperscript{22,23}, however midwives, including midwives caring for Indigenous women, have expressed reluctance to address smoking, concerned that they may damage their relationship with their clients\textsuperscript{12,24}. Similar concerns have been expressed by AHWs, with the additional concern that AHW smoking may impede providing advice\textsuperscript{25}. However, over half the women in our study indicated that support from each of the health professionals was likely to be helpful, suggesting this approach is acceptable, is perceived to be effective, and may be a fruitful approach.
Other strategies

Community activities were rated fifth and sixth by current smokers and providers respectively but tenth by ex-smokers. The reasons for the lower support among ex-smokers are not known. Previous studies have emphasised the preference of Indigenous Australians for programs to be community-based\textsuperscript{21}. Although community interventions increase knowledge of risks, change attitudes to smoking and increase quit attempts, they have not been shown to reduce the prevalence of smoking\textsuperscript{26,27}. Other activities considered helpful by at least half of each group included free NRT, support groups and brochures. NRT is efficacious in non-pregnant populations, but evidence for its effectiveness in pregnancy is inconclusive\textsuperscript{28}. Pregnant Indigenous women have previously been found to have relatively low levels of nicotine dependency\textsuperscript{29}, which may contribute to the lower rating for NRT in our study. Current guidelines state that NRT should be considered if a pregnant woman is otherwise unable to quit\textsuperscript{30}, and it would therefore be reasonable to include free NRT as a component of future cessation trials. In non-pregnant populations, group programs are more effective than self-help and other low-intensity interventions, but the limited research in this area has not provided an adequate evidence base to determine whether they are more effective than intensive individual counselling, or whether they provide additional benefit as an adjunct to individual support\textsuperscript{31}. Although generally supported by respondents in each group, the logistic challenges of running groups, particularly in rural areas, would need to be overcome if they were to be included in future smoking cessation trials. Low-intensity interventions, including providing verbal or written advice, demonstrated a small benefit in the Cochrane review on antenatal smoking cessation\textsuperscript{5}. While unlikely to have a large impact, culturally appropriate brochures and other resources may be a useful prop to use when discussing smoking cessation.

Interestingly, less than half the current smokers thought that stress management programs would be helpful. Research on smoking among Indigenous Australians has emphasised stress as an impediment to cessation\textsuperscript{21,32}. Although stress contributes to pregnant women failing to quit, and stress management techniques are included in some cessation programs, the evidence on their benefit is inconclusive\textsuperscript{33}.  
Limitations

A number of limitations need to be considered in interpreting the results from this study. The response rate was higher among the women than the service providers. The reasons for this difference are unknown, but it may be due to differences in recruitment, with providers recruited by letter, and women recruited through a personal approach. Secondly, the sample is fairly small, despite the reasonably good response rates. However, Indigenous women are a small proportion of the population, and engaging them in research can be challenging. One of the strengths of this study is that it includes women from across two different states, and they are representative of pregnant Indigenous women nationally with regard to age and parity. Thirdly, a delay between the providers’ and the women’s surveys may have impacted on the results. However, we are unaware of any specific programs or initiatives which occurred between the two surveys that could be considered to impact on the findings. A fourth limitation is that the data are drawn from cross-sectional surveys, with no opportunity to explain the proposed strategies in more detail, or to explore the reasons for support or opposition to the strategies. More importantly, the apparent support may not translate into implementation or uptake, or into actual changes in smoking behaviour. Further intervention research is required to explore the feasibility of implementing these strategies in real-world settings, their uptake by pregnant women, and their actual impact on smoking rates and health outcomes.

Conclusions

Exploring the views of stakeholders involved in antenatal smoking cessation – the providers and the pregnant women – has identified the strategies which are most acceptable, and thus the ones most likely to be implemented if introduced in routine care. These strategies, if known to be effective in other pregnant populations, should be included in interventions and tested in trials to assess their real-world uptake and their impact on smoking behaviours and health outcomes. Given the apparent efficacy of rewards in other population groups, further research is required to assess their efficacy among pregnant Indigenous women and to identify reasons for their lower support by providers.
References


PAPER SEVEN

How will we close the gap in smoking rates for pregnant Indigenous women?

Systematic reviews are considered the gold standard for evidence to inform policy and practice. Previous systematic reviews on the effectiveness of interventions for smoking cessation among pregnant women have not assessed the evidence separately for Indigenous women. Similarly, systematic reviews of the effectiveness of smoking cessation interventions for Indigenous peoples have not considered pregnant women separately from the larger Indigenous population. It is therefore valuable to undertake a systematic review of smoking cessation interventions specifically for pregnant Indigenous women in order to inform program and policy development in this critically important area.

Paper Seven reports a systematic review of smoking cessation interventions specifically targeting pregnant Indigenous women. The paper has been published in the *Medical Journal of Australia* (Appendix 1.6). An additional table, not included in the published paper, is in Appendix 6.1.


CONCLUSIONS, LESSONS LEARNT AND NEXT STEPS
Conclusions, lessons learnt and next steps

Why is this research important and significant?

The persisting disparities in health and wellbeing between Aboriginal and Torres Strait Islander peoples and non-Indigenous Australians remain a national shame and require urgent and persistent action. Smoking has been identified as the most important modifiable risk factor contributing to the poor health outcomes of Aboriginal and Torres Strait Islander peoples, responsible for 17% of the total health gap in burden of disease\(^1\). Smoking is also the most important modifiable risk factor for adverse birth outcomes\(^2\), and pregnancy is a time when women are motivated to make changes for the sake of their babies\(^3\). Thus, pregnancy provides an opportunity to have a significant impact on the health of both the mother and the baby, with potential lifelong benefits for both\(^4\). If ways can be found to support women to quit smoking during their pregnancies, there are immediate benefits for both mother and baby. If women can then be supported to remain non-smokers, the benefits will persist for the mother and the family. Currently, 50% of pregnant Aboriginal and Torres Strait Islander women smoke during pregnancy – three times the rate for non-Indigenous women\(^5\). There are, therefore, few other opportunities with the same potential for reducing smoking-related harm and reducing the disparities in health for Aboriginal and Torres Strait Islander peoples.

Despite the obvious potential opportunity that pregnancy provides for reducing smoking and improving health among Indigenous Australians, there has been relatively little research on this topic. Prior to the commencement of this doctoral research, there had been little research specifically exploring factors related to antenatal smoking for Indigenous women, minimal exploration of women’s views, beliefs or their actual behaviour, little research exploring the social context of smoking among rural Indigenous peoples, little research on why girls started smoking, no research exploring antenatal provider knowledge, beliefs and attitudes, and no published trials of interventions specifically addressing smoking during pregnancy among Indigenous women. Most of the published research on antenatal smoking was confined to...
individual services and communities, with little at state or national level. Much of the literature on Indigenous smoking more broadly was based on research in remote communities, which may not be applicable to rural or urban settings. While there has been more research in this area in recent years, the research conducted for this thesis has contributed significantly to the field.

Finding ways to reduce the prevalence of antenatal smoking requires an understanding of the multiple and inter-related factors contributing to the high prevalence. These factors may relate to the individual woman, her social environment, or the support provided by health and other services for cessation. Although these divisions are somewhat artificial, given the considerable interactions among them, they help to provide a framework for considering the opportunities for action. Factors contributing to women’s smoking behaviour play out over the life course, with a range of factors contributing to initiation of smoking, and others to continued smoking or to decisions to quit. Quit attempts may be successful or not, depending on a number of social and personal elements, in addition to the support received. This thesis has attempted to explore this complexity, although many questions remain.

**Understanding the social and structural drivers of smoking**

**Rationale**

The marked variability in smoking between countries, within countries and between different sub-populations highlights the importance of social, cultural and structural drivers in smoking behaviour\(^6,7\), affecting both the uptake of smoking and subsequent smoking or quitting. The socioeconomic differential in smoking is well-recognised, with more disadvantaged peoples generally over-represented among the smoking population\(^7,8\). Social environments can impact behaviour through social and cultural norms, exposure to behaviours, access to resources, knowledge and skills, beliefs, motivation, aspirations and values. It is therefore important to understand the social environments and factors contributing to smoking initiation among young Indigenous girls and women, as well as how these environments influence women’s ability to quit.
smoking. Understanding the behaviour in context is crucial to designing effective interventions.

How I approached this issue

In order to understand the social context of smoking for Indigenous women, and the impact this has on smoking initiation and smoking during pregnancy, this thesis has reviewed the literature on drivers of smoking behaviour among Indigenous Australians, including during pregnancy (Introduction), and explored women’s own views and stories (Paper One). All findings were discussed extensively with the project’s Community Reference Group (CRG). Interpretation and discussions with the CRG were critical to understanding women’s experiences, particularly in relation to stigma, racism and marginalisation.

What do the findings suggest for reducing maternal smoking?

The findings confirm the complex social, cultural and structural drivers of smoking among Indigenous women. Both historical and contemporary factors contribute to persisting marginalisation and disadvantage, resulting in numerous social drivers of smoking, many of which cannot be addressed by antenatal care providers, but require broader policy and social responses.

At the policy level, the findings highlight the importance of preventing initiation of smoking, as the uptake of smoking is the major determinant of the prevalence of smoking among women when they become pregnant. Quitting smoking tends to occur in response to perceived personal threat. Most Indigenous ex-smokers are older, having already experienced the physical consequences of their smoking⁹. By contrast, most pregnant women are young and they have not yet reached the age where their health is declining due to smoking. Although pregnant women may want to quit for the sake of their babies well-being, many women still begin their pregnancy as smokers. Reducing smoking initiation is thus critically important in reducing antenatal smoking, and will require a mix of policy approaches. These approaches may include addressing the social determinants of poor health to improve young girls perceived and real options and life choices, ensuring media messages have salience for young Indigenous
girls and their families and are available through multiple mechanisms including social media, and recruiting Indigenous leaders to help reframe cigarette smoking as something that is not a part of traditional Aboriginal and Torres Strait Islander culture. Additionally, the findings in this thesis and other research\textsuperscript{10,11} highlight the impact that the family and community have on smoking initiation and cessation through role modelling, availability of cigarettes and exposure to second-hand smoke. Raising awareness of these issues among Aboriginal and Torres Strait Islander communities will help guide community and family choices and behaviour, providing opportunities to reduce uptake of smoking among their children and to support pregnant women to quit.

The findings in this thesis also suggest that it is critical that antenatal providers understand and acknowledge the social drivers of smoking when providing support to pregnant women to quit, including involving family and other social networks in quit attempts whenever possible. Providers need to acknowledge the challenges, recognising that many women have stressful lives and may lack personal power within their domestic situations. Additionally, as observed by members of the CRG, many women may have little previous experience of personal success, resulting in low self-efficacy and low expectation of their own ability to quit. Antenatal providers thus need to celebrate all successes, no matter how small, and use an empowerment approach, building on women's own values and strengths\textsuperscript{12}.

**Future research directions related to addressing the social drivers of smoking**

The study reported in Paper One was undertaken in one rural area in NSW, necessarily limiting its generalisability to other Indigenous communities. While the findings related to the social influences on smoking largely resonated with previous research on Indigenous smoking\textsuperscript{13,14}, there has been less research specifically exploring influences on smoking initiation among Aboriginal and Torres Strait Islander youth. A recent study from the Northern Territory also identified family and peer social influences and the normalisation of smoking as critical influences in the uptake of smoking among Indigenous youth, with these social influences more widespread for Indigenous than
Additional research in other urban and rural locations is needed to better understand the drivers for initiation in a variety of settings and, more importantly, to understand what would reduce uptake. This research – exploring who, what, where, when and how – would help Indigenous adolescents not to smoke, and should be followed by trials testing empirically derived interventions. Related to this issue would be exploration of the impact of recent tobacco control policy and legislation, especially “plain packaging” of cigarettes, on smoking initiation among Indigenous youth.

In the last six years there has been significant investment from the Australian Government in initiatives directed at reducing smoking among Aboriginal and Torres Strait Islander peoples. The Indigenous Tobacco Control Initiative was launched in 2008 and funded a range of community-based projects specifically addressing tobacco use. In 2009 this initiative was followed by the Indigenous Chronic Disease Package, a national program aimed at reducing chronic disease among Indigenous peoples, with a focus on reducing risk factors and improving health and wellbeing. Within this package, the Tackling Indigenous Smoking program aims to reduce smoking rates through community-level initiatives provided by a network of regional tobacco coordinators and tobacco action workers. It is critical that this program be rigorously evaluated to assess its impact, recognising that multiple outcomes, beyond just the prevalence of smoking, are important. In addition to considering the impact on initiation and cessation, it will be helpful to consider the intermediaries to changes in prevalence: knowledge and beliefs about smoking and its harms; the salience and relevance of the various messages regarding smoking; quit attempts; and use of cessation supports. Exploration of the impact of these initiatives on social behaviour related to smoking would also be beneficial. This may include changes in knowledge, attitudes and behaviours regarding smoking around others, sharing cigarettes, and supporting others’ quit attempts.

Given the importance of family and community influences on smoking behaviour identified in this thesis and by others, antenatal smoking cessation trials that
include family and community components would also be valuable. These components may be trialled either alone, or within a program providing direct support to individual pregnant women, and will require study designs using the community as the unit of intervention.

**The role of individual characteristics**

**Rationale**

Some women never start smoking, others are able to quit smoking when they become pregnant, while others continue to smoke. Understanding this variability and the factors that contribute to it will assist in identifying appropriate levers for change in order to develop effective programs to support more women to quit. This analysis may also identify factors which are amenable to broader policy initiatives addressing the social drivers of smoking.

It is critical that we have a clearer picture of the current situation with regard to women’s smoking and cessation behaviour during pregnancy. National and state datasets do not provide sufficient information to be able to assess individual changes, including reduction in the number of cigarettes smoked and individual cessation\(^5\), and few previous studies have explored women’s actual behaviour. Reporting of smoking status at the first antenatal visit potentially misses identifying women who have already quit smoking since becoming pregnant, and underestimating pregnancy as a motivational driver of cessation for women. Exploring the barriers and enablers to quitting for individual women will assist in designing interventions that address or overcome the barriers, while enhancing enablers and drawing on the motivators for cessation.

Within any analysis of individual-level factors, we must also recognise that individual characteristics are moulded and shaped by prior and current social and environmental influences (including community and family characteristics, the broader social and political environment, and personal opportunities and experiences) and avoid stigmatising or blaming individuals for their smoking behaviour. Rather, an exploration
of individual characteristics associated with quitting or continued smoking helps to identify critical leverage points and factors which need to be addressed within quitting programs, and assists with appropriate targeting to those most in need.

How I approached this issue

The results of the surveys of pregnant women presented in Papers Two and Three help address these issues. In Paper Two, the impact of pregnancy on women’s smoking behaviour was assessed, identifying that the majority of women who smoked reported quitting or cutting down since becoming pregnant, confirming the motivational impact of pregnancy. In the same paper, the relationship between women’s smoking behaviour and their knowledge of risks, and attitudes to smoking and cessation, were explored. In Paper Three, an assessment of the role of other substance use in women’s smoking behaviour confirmed clustering of risks among a small group of very disadvantaged and vulnerable women. The surveys were undertaken in both NSW and the Northern Territory, with high response rates, and thus provide data of sufficient quality to explore these issues, although they do rely on self-report.

What do the findings suggest for reducing maternal smoking?

The findings confirm that Aboriginal and Torres Strait Islander women are currently making considerable efforts to reduce smoking-related harms for their unborn babies. Many women quit smoking, and the majority of those who continue to smoke report significantly reducing the amount smoked. Nonetheless, poor knowledge of the real impact of smoking, combined with other risks including poor education, high levels of stress, other substance use and early smoking initiation, are associated with persistent smoking during pregnancy (Papers One to Three). Combined, these findings suggest that women are highly motivated to minimise harms to their babies, but need additional support, firstly to decide to quit rather than just cut down, and secondly to succeed in their quit attempt.

In supporting women to make these changes, recognition of the importance of family and relationship obligations (see Paper One), and the primacy they may hold over
individual health concerns may help frame messages which are more salient to women than messages focused on individual health risks and fear\textsuperscript{12,17}. It is important that women are provided with information on the harms of smoking and benefits of quitting. However, framing these messages positively, with a focus on immediate and short-term benefits to their babies and families if they quit smoking, is likely to be more persuasive than messages focused on harms and long-term impacts\textsuperscript{12,17}. It is critical that women who decide to try to quit smoking are well-supported in their attempts. The findings from this thesis and other research\textsuperscript{14,18} confirm that many women face numerous challenges to quitting. Simply providing advice to quit, or motivating them to make a quit attempt, without providing adequate support is both unfair and unethical, as it risks increasing “shame” and further disempowering women. While there is currently no evidence of what works in smoking cessation for pregnant Indigenous women, a “best bets” approach suggests that providing support will need to be tailored to individual circumstances, with engagement of partners and other household members to support women, assessment for use of other substances, with appropriate management, and support to address stressors if at all possible (see Paper Seven). Continuation of support for abstinence in the post-partum period is critical to prevent relapse and support women to become permanent non-smokers\textsuperscript{19}. Again, messages focusing on the benefits to the family may be more effective than messages focused on the long-term harms to the mother\textsuperscript{12,17}. These benefits may include improved family finances, reduced exposure of children to second-hand smoke, and the impact of positive role modelling.

At the population level, social marketing and community-level campaigns may support antenatal smoking cessation by focusing on ways that other people can support women to quit. Focusing exclusively on the individual woman runs the risk of shaming pregnant smokers. Building a broader awareness and understanding of ways to support women to quit shares the responsibility and provides friends and family with information on how they can help.
Future research directions related to supporting individual women to quit smoking

There is a critical and urgent need to develop and trial smoking cessation support programs for pregnant Indigenous women, that address the complex issues identified in this thesis. Such programs must be developed, implemented and evaluated with Indigenous women to ensure they are culturally secure and sensitive to women’s issues\(^20\). Trials of these programs must be conducted in a rigorous manner in order to develop high-quality evidence to guide policy development and subsequent practice. Antenatal care providers have a duty of care to provide smoking cessation support\(^21\) and are in frequent contact with pregnant women\(^5\). It is therefore important to test programs that are designed to be delivered by antenatal providers, within routine care settings. Initial feasibility and acceptability studies should precede larger scale trials, and interventions should be tested in urban, rural and remote settings, as both the feasibility of implementation and the effectiveness of different approaches may vary across these settings. These trials will require study designs, such as cluster randomisation or multiple baseline, that use the service as the unit of analysis rather than individual randomisation\(^22\). Given the current policy environment, with Tackling Tobacco Workers working in multiple communities across Australia, approaches that link with this program could also be considered. Strategic partnerships with this program would increase the options for community-level interventions to be provided in conjunction with those provided within the antenatal setting.

The effectiveness of different approaches, including the impact of intensive support programs, the use of various types of incentives and peer support groups, could be tested. Each of these approaches is resource intensive, and their differential impact could be tested using a step-wise implementation approach within services. The effectiveness of support to prevent relapse, both during pregnancy and in the post-partum period, should be included and tested in these trials, including among women who quit spontaneously early in pregnancy.
As part of these trials, or independent from them, there is a need for testing of the most effective ways to communicate messages related to antenatal smoking cessation. In the section above, it was argued that messages should focus on short-term benefits to the baby and family, as well as on the woman’s influence as a role model within the family, and that broader social marketing campaigns should address ways that friends and family can support pregnant women to quit. The content and mode of delivery of such messages is therefore an important area for future research. The use of brochures and pamphlets may be appropriate in the immediate antenatal setting, but social marketing approaches should also be explored. Tailoring to local culture and language will be important, and require additional testing of messages and modes of delivery in different contexts.

High levels of stress are perceived to make cessation extremely difficult (see Papers One and Two and Wood et al [14]), suggesting that another valuable direction for future research is testing interventions to help women better manage their stress. Interventions found to be effective for stress management with other population groups could be tested with Indigenous Australians, including pregnant women. The benefits from successful interventions are likely to reach well beyond smoking cessation and pregnancy.

*Support from antenatal providers*

**Rationale**

While there are both individual and environmental factors contributing to smoking behaviour, the health care system also contributes through the quality and amount of support provided for cessation. The majority of pregnant Indigenous women attend for antenatal care, seeing their antenatal providers repeatedly through their pregnancy. These providers are thus well-placed to provide smoking cessation advice. It is therefore important to understand what is currently being offered in relation to smoking cessation support, as well as to explore the motivators, barriers and enablers to providing advice and support. These issues have not previously been assessed in
relation to provision of smoking cessation support within antenatal care for Indigenous Australian women.

Wherever possible, policy and practice should be informed by the best available evidence. An understanding of the current evidence base for smoking cessation interventions for pregnant Indigenous women is therefore required. Where there is insufficient evidence of effective approaches, trials of new approaches are needed. In developing cessation support programs, exploring the views of both women and antenatal providers on different components will help identify those components likely to be most acceptable for inclusion in such trials.

**How I approached this issue**

Surveys with antenatal providers in both the Northern Territory and New South Wales explored their attitudes and behaviour related to assessing smoking status among pregnant women, as well as the factors associated with routinely assessing all pregnant women for smoking (Paper Four). The majority reported assessing all women in their care, but knowledge of smoking cessation was generally poor, and those with the poorest knowledge were least likely to assess women’s smoking behaviour. Those who did not report assessing all women were also more likely to indicate concern about “pushing women away from antenatal care” if they advised them to quit smoking. Paper Five confirmed that the majority of women reported being assessed for their smoking status, and the majority of smokers recalled being offered advice and support to quit. The study did not assess the quality or type of advice, which may not have been effective, given the limited knowledge of smoking cessation among providers and the continued smoking among these women. Paper Six explored the views of both the antenatal providers and pregnant women on various smoking cessation support strategies. Views on the role of antenatal providers in addressing smoking were also assessed, among women in Paper Two and among providers in Paper Four, with both groups confirming that supporting smoking cessation is an important part of antenatal care. A systematic review of the evidence for smoking cessation interventions specifically for pregnant Indigenous women identified only two
trials in this area, and that neither of the interventions tested\textsuperscript{23,24} had been effective (Paper Seven).

**What do the findings suggest for reducing maternal smoking?**

The findings in Paper Four suggest that antenatal providers need further training in providing effective smoking cessation support in order to increase their skill base, confidence and effectiveness in supporting women to quit smoking. As part of this training, it will be important to emphasise that pregnant women consider addressing smoking to be a component of antenatal care, and are not likely to be “pushed away” if assessment and advice are offered in a supportive and empathic manner. It will also be important to emphasise that smoking cessation advice should be provided by all members of the antenatal team (see Paper Six) and repeated throughout the pregnancy to maximise support for cessation\textsuperscript{21}. The potential of smoking cessation for improving birth outcomes should also be highlighted\textsuperscript{25}, in order to raise the priority placed on addressing smoking when providers are caring for women with multiple and competing concerns.

In the absence of a sound evidence base for smoking cessation programs specifically for pregnant Indigenous women, policy-makers and providers should consider developing approaches identified by women as likely to be helpful, and for which there is an evidence base in other pregnant populations. Documentation of feasibility and outcomes will also help generate information on the effectiveness of these approaches in real-world Australian Indigenous settings.

**Future research directions to improve support from service providers**

The lack of a solid evidence base for effective interventions for smoking cessation among pregnant Indigenous women severely hampers the efforts of providers to support women to quit. As suggested above, developing this evidence base is an urgent priority. Preliminary descriptive research could support this process by exploring the types of smoking cessation support currently available in different settings across Australia. This research may include a scoping study of antenatal
smoking cessation programs being offered, to identify approaches that appear to be both feasible and effective. Research related to implementation of the Tackling Indigenous Smoking program may also be informative, particularly in regard to feasibility, acceptability and perceived successes. Lessons learnt from both existing antenatal smoking cessation programs and the Tackling Indigenous Smoking program could then be used in developing interventions for formal trials.

Further research to assess barriers to antenatal clinicians providing smoking cessation support and identify factors that would facilitate implementation would also be useful. Exploration of ways to increase provider prioritisation of smoking cessation and provision of cessation care is needed. The common perception of smoking as a “lifestyle choice” may lead to smokers being blamed for their smoking, particularly if they are pregnant. This perception may contribute to discomfort among providers in addressing the problem. Ways to overcome these perceptions and increase the priority placed on smoking cessation are needed, and may benefit from research addressing these questions. Other research questions could address service capacity and options for cessation support. How do we increase service capacity to enable more intensive support for women, or to provide support for their family members as well? Do we need specialist smoking cessation services, or should this remain part of antenatal care? How much should the focus be on the individual and how much on the family and community? Are community-based interventions effective in reducing antenatal smoking?

More in-depth exploration of the views of both Indigenous women and antenatal providers on the use of incentives for smoking cessation is also warranted, specifically to determine the concerns related to their use. Although systematic reviews have identified the use of financial incentives as the most effective intervention for antenatal smoking cessation, the evidence base still faces major limitations. The published trials were largely undertaken in the United States, had relatively small sample sizes and did not include exploration of potential negative consequences. It would be helpful to undertake feasibility and acceptability studies with Indigenous
Australian women that include assessment of potential negative consequences, similar to one currently underway in the UK\textsuperscript{27}.

\textit{Final thoughts}

\textbf{Limitations and strengths}

The studies included in this thesis are weakened by a number of factors, including small sample sizes, self-report of behaviour, limited exploration of some issues, and the fact that they are descriptive, with the result that any associations detected do not necessarily reflect causation. The preferences for different strategies to support smoking cessation, described in Paper Six, do not necessarily identify effective strategies, but simply those considered likely to be helpful; their actual feasibility and effectiveness will need to be tested. The results presented from each of the surveys include respondents (both women and Aboriginal Health Workers) from remote regions. It is likely that these respondents have vastly different cultural backgrounds to the women from less remote regions. While it would have been preferable to be able to analyse these data separately, this was not possible due to the small sample size. Additionally, the NSW based community reference group may not have had sufficient cultural knowledge to assist with interpretation of findings from remote regions. These limitations have been described in more detail in each paper.

However, the research also has several strengths: the surveys were undertaken across two states, representing quite varied social and geographic settings; the response rates were generally high; the survey development was informed by initial qualitative research which helped to contextualise smoking; and the studies have provided the first data on many of these issues. The most critical factor strengthening the research was the input and support provided by the CRG, which contributed to every stage of the research, ensuring rigour, relevance and cultural security. The work was further strengthened by the collaboration with the Aboriginal Maternal and Infant Health Service staff who were involved in the project from the beginning and helped ground the work in the real-world context of Indigenous health service delivery.
More intervention research needed

Despite the fact that the research included is entirely descriptive, this thesis has repeatedly argued for the need for more intervention research in this field. This begs the question why there has only been one trial of a smoking cessation intervention for pregnant Aboriginal and Torres Strait Islander women and why there is such limited intervention research in Aboriginal and Torres Strait Islander health more broadly\(^28\text{-}30\). The answer lies, at least in part, in the challenges and complexity of conducting this research in an ethical and principled manner.

Principles for conducting Indigenous health research

Principles for conducting Indigenous health research are outlined in numerous guidelines and other documents, and have recently been summarised by a group of researchers with many years’ experience in Indigenous health research\(^20\). The authors list ten principles:

1. **Addressing a priority health issue as determined by the community**
   This requires researchers and communities to work as equal partners to ensure the researchers’ agendas do not override those of the community or communities.

2. **Conducting research within a mutually respectful partnership framework**
   The authors expand on this principle to highlight the need for transparency, long-term commitments to the relationship with the community and the need to identify key champions for the research within each community.

3. **Capacity building is a key focus of the research partnership, with sufficient budget to support this**
   This includes employing Indigenous staff and supporting them to develop their research careers, if possible. The authors also point out that this process also builds the capacity of non-Indigenous researchers to work with Indigenous communities.

4. **Flexibility in study implementation while maintaining scientific rigour**
   This may include modification of study protocols or inclusion criteria based on feasibility issues and community feedback. Involving community members and leaders
from the early stage of planning may help reduce the need for subsequent modifications.

5. **Respecting communities’ past and present experience of research**
   This includes acknowledging the broader history of colonisation, removal of children, social disadvantage and marginalisation, in addition to negative experiences of past research where the Indigenous people involved in the research had no control and received no benefit.

6. **Recognising the diversity of Indigenous Australian populations**
   There is great heterogeneity among Australia’s Indigenous groups. Recognising this diversity is especially important when planning research involving many different, culturally distinct groups.

7. **Ensuring extended timelines do not jeopardise projects**
   Research in Indigenous health may be delayed due to multiple factors including obtaining ethical approval, time required for community consultation, staff turnover and unforeseen community events. Allowing for this possibility in the planning phase is critical.

8. **Preparing for Indigenous leadership turnover**
   Many Indigenous leaders are under considerable pressure, both from external groups and their communities, and turnover is high. Researchers should not rely on a small number of leaders to promote and advocate for their study, but should engage more broadly.

9. **Supporting community ownership**
   Research projects are only sustainable when there has been substantive community input and ownership.

10. **Developing systems to facilitate partnership management in multicentre studies**
    It is necessary to establish fair and transparent processes to manage the study and all its processes, particularly where multiple sites and communities are involved.20.
Challenges for intervention research

These principles apply to all types of research, but may be more challenging to achieve for intervention trials, for a number of reasons.

1. **Study design issues**

Trials of interventions require comparison with a control group not receiving the intervention, in order to provide evidence that the intervention is responsible for any changes detected. Individually randomised trials are considered the gold standard but may not be feasible with behavioural interventions, such as smoking cessation, where the same clinicians provide care to both the intervention and the control groups. Additionally, individual randomisation may result in people who are closely related or connected through kinship and community ties being allocated to different groups, resulting in discord and dissatisfaction among participants, with services reluctant to participate in the process. Alternative designs such as cluster randomised trials or multiple baseline designs, with random allocation of services or communities, provide rigorous evidence of effectiveness but require involvement of multiple sites. Ensuring appropriate and respectful engagement with multiple sites and communities, including negotiating issues such as research questions, intervention design and capacity building, requires considerable investment of time, money and personnel. Despite this investment, initial negotiations may not result in sufficient sites agreeing to participate, or services may have a strong preference to receive the intervention, making it difficult to find services willing to risk being randomised to the control or delayed-intervention group. As a result, the trial may not progress.

2. **Inadequate resourcing of community/researcher engagement**

Lack of research funding to support initial community liaison, or for ongoing engagement and capacity building for the duration of a trial, hampers the capacity of researchers to engage with multiple communities to develop and implement intervention research, and has been identified as a critical barrier by a recent Commonwealth Government review of health and medical research. However, it is not only researchers who have limited capacity to engage in this process. Aboriginal communities and the Aboriginal Community Controlled Health Service (ACCHS) sector also have limited capacity to engage with researchers. ACCHSs are funded to provide
services for their community, not to negotiate with researchers. Peak bodies such as the National Aboriginal Community Controlled Health Organisation (NACCHO) and its state and territory affiliates are frequently approached by researchers interested in undertaking research, but do not have the staff or the time to become involved with multiple research projects, even those of high priority (Jenny Hunt, personal communication). Further challenges can relate to requirements for obtaining ethical approval for research. For example, the Health Research Ethics Committee of the Aboriginal Health & Medical Research Council, the peak body for the ACCHS sector in NSW, requires a letter of support from a local ACCHS in each community involved in the research \(^3^4\) (See Appendix 4.1 for letters of support from each ACCHS approached to request support for this research). These letters are required even if the research is being undertaken in collaboration with a government service and the local ACCHS is not involved in the research. A request from researchers for time to discuss research not involving their own service is potentially confusing to an ACCHS and places an additional strain on their limited resources.

3. **Sample size issues**

Recruiting sufficient participants for a study can be particularly challenging in research with Indigenous Australians \(^3^5\). The small number of potential participants in individual communities provides an additional requirement for involving multiple sites in research projects. Small sample sizes are especially a problem for intervention research related to less common conditions such as smoking during pregnancy. When trials are conducted across multiple sites, it is challenging and resource intensive to provide appropriate monitoring and supervision to ensure integrity in implementation of the research protocol. Additionally, given the diversity of Indigenous communities across Australia (from urban to remote), protocols need to be sufficiently flexible to allow implementation within local conditions while maintaining rigour and integrity. Finally, while ideally research related to Aboriginal and Torres Strait Islander health should involve Aboriginal and Torres Strait Islander people as senior members of the research team, there are still relatively few qualified Indigenous researchers \(^3^3\).
Long-term investment is required

Long-term strategic investment in Indigenous health research will be required to develop the evidence base to fully “Close the Gap” in Indigenous health outcomes. This investment should include funding and mechanisms to support research teams to better engage with Aboriginal and Torres Strait Islander communities and services, and to support the ACCHS sector to engage with researchers and drive the research agenda. Investment in training more Indigenous researchers is essential, while there is also the need to enhance the skills and capacity for non-Indigenous researchers to work appropriately and respectfully with Indigenous peoples. The NHMRC Road Map II outlines a framework and action areas to address the majority of these issues, and full implementation of this framework is critical. The establishment of the Lowitja Institute, Australia’s National Institute for Aboriginal and Torres Strait Islander Health Research (www.lowtija.org.au), to drive collaborative research to improve Aboriginal and Torres Strait Islander health is another positive advance, but a long-term funding commitment is required. Universities and research institutions must also play their part by recognising the requirements for conducting respectful and appropriate research with Aboriginal and Torres Strait Islander communities. These institutions must support their researchers to undertake research that respects the principles outlined above, while recognising the value of this work and placing less emphasis on traditional research metrics such as grant success and publications in academic journals. At a societal level, a greater respect and appreciation of the richness and diversity of Indigenous culture and heritage would facilitate collaboration among Aboriginal and Torres Strait Islander peoples, researchers and policy-makers, assisting us to move forward with eliminating the gap in health and wellbeing between our First Peoples and non-Indigenous Australians.
References


34. Aboriginal Health and Medical Research Council of New South Wales. AH&MRC Guidelines for Research into Aboriginal Health: Key Principles. Sydney Aboriginal Health and Medical Research Council; 2013.


36. National Health and Medical Research Council. The NHMRC Road Map II: A strategic framework for improving the health of Aboriginal and Torres Strait Islander people through research. Canberra: Commonwealth of Australia; 2010.
Understanding Smoking by Pregnant Aboriginal Women

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University of Newcastle

VOLUME 2
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Appendix 1
1.1 Published Paper One
“It’s almost expected”: rural Australian Aboriginal women’s reflections on smoking initiation and maintenance: a qualitative study

Megan E Passey¹*, Jennifer T Gale¹ and Robert W Sanson-Fisher²

Abstract

Background: Despite declining smoking rates among the general Australian population, rates among Indigenous Australians remain high, with 47% of the Indigenous population reporting daily smoking - twice that of other Australians. Among women, smoking rates are highest in younger age groups, with more than half of Aboriginal women smoking during pregnancy. A lack of research focused on understanding the social context of smoking by Aboriginal women in rural Australia limits our ability to reduce these rates. This study aimed to explore the factors contributing to smoking initiation among rural Aboriginal women and girls and the social context within which smoking behaviour occurs.

Methods: We conducted three focus groups with 14 Aboriginal women and service providers and 22 individual interviews with Aboriginal women from four rural communities to explore their perceptions of the factors contributing to smoking initiation among Aboriginal girls.

Results: Four inter-related factors were considered important to understanding the social context in which girls start smoking: colonisation and the introduction of tobacco; normalization of smoking within separate Aboriginal social networks; disadvantage and stressful lives; and the importance of maintaining relationships within extended family and community networks. Within this context, young girls use smoking to attain status and as a way of asserting Aboriginal identity and group membership, a way of belonging, not of rebelling. Family and social structures were seen as providing strong support, but limited the capacity of parents to influence children not to smoke. Marginalization was perceived to contribute to limited aspirations and opportunities, leading to pleasure-seeking in the present rather than having goals for the future.

Conclusions: The results support the importance of addressing contextual factors in any strategies aimed at preventing smoking initiation or supporting cessation among Aboriginal girls and women. It is critical to acknowledge Aboriginal identity and culture as a source of empowerment; and to recognise the role of persistent marginalization in contributing to the high prevalence and initiation of smoking.

Background

Addressing tobacco smoking among Australia’s Aboriginal and Torres Strait Islander population is critically important to reducing the excessive burden of disease borne by this group [1]. Tobacco smoking causes or exacerbates lung cancer, chronic obstructive pulmonary disease, asthma, other cancers, cardiovascular disease, pregnancy complications and low birth weight as well as numerous other conditions [2]. It is the largest preventable cause of morbidity and mortality for Aboriginal and Torres Strait Islander people [1]. Despite declining smoking rates among the general Australian population, rates among Indigenous Australians remain high, with 47% of the Indigenous population reporting daily smoking compared to 20.9% of the non-Indigenous population [3]. Smoking rates are similarly elevated among the Indigenous peoples of New Zealand, Canada and the United States [4-6].

Socio-economic disadvantage and associated stressors are recognised as drivers of smoking internationally
While it is acknowledged that the socio-economic disadvantage suffered by many Indigenous Australians contributes to the high prevalence, the rates of smoking are higher for Indigenous than non-Indigenous Australians within socio-demographic groupings. For instance stratifying by employment status, education or income, Indigenous Australians are almost twice as likely to smoke as their non-Indigenous counterparts [6]. Similarly in New Zealand, within all age, gender and socio-economic groupings, the prevalence of smoking among Maori is higher than among non-Indigenous New Zealanders [10] indicating that factors beyond socio-economic differentials are contributing to differences in smoking behaviour. However, there is still limited empirical evidence to increase our understanding of the processes driving this differential at the local level or the best approach to reducing it.

Among Australian Aboriginal peoples, the experience of colonisation has contributed to the use of tobacco through both the social consequences of colonisation and the introduction of tobacco [11-13]. Tobacco was used traditionally in northern Australia, through trade with Macassan fisherman, but its availability was seasonal and its use regulated through social control mechanisms [11,12,14]. In south-eastern Australia, tobacco was not used traditionally [11]. Following European colonisation tobacco became more widely available throughout Australia and was included in rations on missions and cattle stations [11]. Thus, although the traditional patterns of use varied, the coming of Europeans greatly increased supply, and created widespread use of tobacco among Aboriginal peoples. Social consequences of colonisation contributing to the high rates of smoking include the experience of land dispossession, loss of language, culture and social systems [15], and subsequently becoming a marginalised group with considerable socio-economic disadvantage and high levels of stress [11-14,16]. Normalisation of smoking in Aboriginal communities and the cultural value placed on maintaining interpersonal relationships through reciprocity and sharing of resources are also considered to contribute to the high prevalence of tobacco smoking [11-14,16].

Smoking is the most important preventable cause of foetal and perinatal mortality in western countries [17]. Indigenous births in Australia are characterised by a higher proportion of premature births, small for gestational age babies and low birth weight babies relative to births to non-Indigenous women [18,19]. Smoking is an independent predictor of these outcomes among Indigenous women [2,19,20]. In 2007 the prevalence of smoking among pregnant Indigenous women in Australia was 51.8% compared to 14.8% in non-Indigenous women [18]. In the same year, 12.5% of Indigenous births were low birth weight, and 13.7% were premature, compared with 5.9% and 7.9% respectively for non-Indigenous births [18].

Addressing smoking during pregnancy requires an understanding of factors influencing being a smoker at the beginning of pregnancy, and those influencing cessation or continuation during the pregnancy. A large body of work has explored the factors influencing tobacco initiation and identified the role of peers [21,22], the social and physical environment [23-25], and parental behaviour [26-28] as influential in uptake of smoking. Qualitative research with adolescent girls has emphasised the role of smoking in self-definition, making social distinctions and acquiring status [29]. However, there has been surprisingly little work exploring smoking initiation among Aboriginal people in Australia.

In a nation-wide consultation process on Aboriginal smoking more broadly, Lindorff identified the importance of children wanting to belong and be accepted by their peer group as contributing to smoking initiation [12]. In remote Northern Territory communities, family influences and intergenerational transmission were critical in shaping youth smoking behaviour [14]. A recent Western Australian study with both Indigenous and non-Indigenous adolescents found that smoking status had little relevance to friendship selection but that lower socio-economic and Aboriginal adolescents reported more peer pressure to try smoking [30]. Smoking rates are also elevated among Native American [31,32] and First Nations Canadian youth, relative to non-Indigenous youth in North America. Correlates of smoking among Indigenous North American adolescents include death or loss of a friend or family member and other stressful life events [36], and maternal smoking during and after pregnancy [37]. Greater academic orientation has been identified as having a protective effect [36]. Indigenous youth have also been found to have greater exposure to tobacco in the home environment [33], to have higher access to cigarettes and greater exposure to smoking peers than other groups [32].

While there is a growing body of research on Indigenous Australian smoking, particularly in remote communities, we are unaware of any work specifically examining the social context of smoking or its initiation by Aboriginal women in rural Australia, where 43% of the Indigenous population live [38]. Given the importance of contextual factors in shaping smoking behaviour, an understanding of the experiences of rural Aboriginal women is critical to developing effective approaches to reduce their tobacco use. In rural Australian towns, the Aboriginal population is generally a minority group living among a dominant non-Indigenous population, grouped together on housing estates and in Aboriginal communities. Due to earlier government policies including forced relocation, Aboriginal people from many parts of Australia live alongside the traditional owners. This contrasts with remote Australian
communities, where Aboriginal people are in the majority and are more likely to live on traditional lands, maintaining strong kinship ties and experiencing less cultural disruption. In this study we explore the factors contributing to smoking initiation among rural Aboriginal women and girls and the social context within which smoking behaviour occurs.

Methods
This exploratory qualitative study involved rural Australian Aboriginal women and service providers in focus groups and semi-structured interviews, to explore their perceptions of social and environmental factors contributing to the high prevalence of smoking; and the role of individual, family and community influences on smoking initiation. The approach was informed by a belief that the social reality for our participants could only be understood through their interpretations of their experiences [39]. The approach was also influenced by Indigenist methodology, which emphasises the importance of relationality, reciprocity and respect [40,41]. This was manifest through a collaborative approach with the local Aboriginal community from the inception of the study to its completion. The findings presented here are part of a larger project addressing smoking and smoking cessation during pregnancy. The study commenced in June 2007, with data collection between September 2007 and February 2008. Ethical approval for this study was obtained from the North Coast Area Health Service Human Research Ethics Committee and the Human Research Ethics Committee of the University of Newcastle.

Initial consultations were held with the local Elders Council. A community reference group (CRG) was formed on their advice, to guide the study and ensure it was conducted in a culturally secure manner [42]. The CRG was composed of five Aboriginal women from the community and five female Aboriginal Health Workers working in maternal and child health. Aboriginal Health Workers are a specific category of Australian health professional. They work in a variety of roles and settings to help bridge the cultural gap between Aboriginal people and the western medical system. The CRG provided advice on the research questions, study design, participant recruitment, interpretation and reporting of results, and met six times during the course of the study. The research team was comprised of non-Indigenous academics and a female Aboriginal community researcher. For this project we collaborated with the community Midwife and Aboriginal Health Worker from the local Aboriginal Maternal and Infant Health Strategy (AMIHS) antenatal team.

Study site
The research was undertaken in a coastal, river region of NSW. It is a rural area, with numerous small communities scattered among towns and regional centres, similar to other coastal areas of Australia. The area experiences considerable socioeconomic disadvantage, with the highest rates of people receiving unemployment benefits (7.7%) and disability or sickness benefits (13.2%) of any Health Area in NSW [43]. Within this area, the AMIHS team provides antenatal care in several communities, including a regional centre of 45,000 people, in which the Aboriginal population is clustered within two suburbs, a town of 17,000 people, a village of approximately 500 people and several Aboriginal communities located on community owned land. Aboriginal people, who make up approximately 3.7% of the population in the area [44], come from across Australia and are not necessarily related to each other.

Data collection
Focus groups
Three focus groups were held prior to the interviews. Focus groups were used initially to explore the range of issues and perspectives that could be elicited through this interactive approach to data collection [45]. They were also useful in understanding the most appropriate language and colloquial expressions to use, and to assess the acceptability of discussing potentially sensitive issues prior to the individual interviews. The first focus group was held with six Aboriginal Health Workers and one non-Indigenous midwife (the “clinician’s group”). Most of the participants were members of the local Aboriginal community and all provided services within the community and had extensive knowledge of both health behaviours and factors influencing behaviour locally. It was felt that their experiences in providing health care might provide additional valuable insights into smoking behaviour not identified through discussions with other participants. The second focus group was with older community women (over 25 years) and the third with younger women (less than 25 years). These two groups were held separately as their experiences and perspectives were likely to differ, and each may feel less constrained in separate forums. The participants were identified by members of the CRG as being articulate and knowledgeable members of the community. They included smokers and non-smokers, and women who were mothers and grandmothers and girls who had not had children. The focus groups, lasting approximately two hours, were conducted by two female researchers - one Aboriginal (JG) and one non-Indigenous (MP).

Semi-structured interviews
Following the focus groups, individual semi-structured interviews were held with 22 other local women who were either currently pregnant or had given birth within 12 months. Individual interviews were important for understanding individual views and experiences and for
capturing women’s personal stories [46]. As smoking during pregnancy was the focus of the larger study, it was important to recruit women with recent experiences of pregnancy. Interviews were conducted by the Aboriginal researcher at sites selected by the women to maximise their comfort with the interview. These included parks, riverbanks, a skatepark and private homes.

**Recruitment**

Women were recruited by the antenatal team or members of the CRG, who explained the study then provided contact details of interested women to the Aboriginal researcher. She contacted the women, provided written information and arranged the woman’s attendance at either a focus group or an individual interview as appropriate. Purposive sampling to maximise variation [47] ensured inclusion of smokers and non-smokers; women from a variety of locations; and with a range of ages and parity. Thematic saturation was achieved in relation to responses from women who smoked and from those who had quit during pregnancy. We were unable to recruit sufficient non-smokers to achieve saturation regarding never smoking or successful permanent quitting. All non-smoking clients of the antenatal service at the time were interviewed. All participants provided written consent.

**Topic areas**

Topics explored in both the focus groups and individual interviews were identified from a review of the literature on smoking initiation and Indigenous smoking; and through team and CRG discussions. A topic list guided the process, but respondents were encouraged to talk freely, telling their stories in their own way. The flexible interview guide, allowed exploration of additional issues raised by women within the interview and in subsequent interviews. Women were encouraged to discuss both their own experiences and their observations and perceptions of the behaviour of others. Topics included:

- Social and environmental factors: the social, cultural and physical environment, and people’s perceptions of how this influenced smoking behaviour; social norms and expectations related to smoking; general perceptions of smoking; prevalence of smoking; acceptability of smoking generally and for different groups or circumstances;
- Smoking initiation: experiences with starting smoking including the circumstances of starting; factors influencing decisions regarding smoking; role of others in starting smoking; views on why girls start smoking; access to and sources of cigarettes.

**Data management and analysis**

Focus groups and interviews were digitally recorded and transcribed verbatim. Each transcript was reviewed for accuracy then offered to participants for review and comment. A content analysis process was used to reveal codes relevant to themes related to the study topic and to identify additional themes [48]. Transcripts were read repeatedly by the first author to familiarise herself with the data. Initial codes were identified and the findings related to these codes summarised and presented to the CRG for discussion and further refinement. Initial codes either related specifically to the interview topics or were derived from the data. Transcripts were then line-by-line coded, with the codes revised from the CRG meeting, using N-Vivo 7. Further codes were developed as additional concepts were identified. The data were organised into themes based on patterns identified, with further review of themes and their relationships to each other and to various stages of smoking behaviour. Comparisons were made between responses from the focus groups and the individual interviews and between women based on the sampling approach (age, parity and location). The results were presented to the CRG at intervals throughout the analysis, to confirm interpretation and further elaborate issues.

**Results**

Fourteen women participated in the focus groups: seven in the clinician’s group, three in the older women’s group and four in the young women’s group. The focus group participants included smokers, ex-smokers and women who had never smoked. Some were mothers of young children or of teenagers; others were grandmothers or girls without children. The Aboriginal Health Workers came from both government and non-government services, and had all been working in the field in excess of 10 years. The characteristics of the 22 women interviewed individually are shown in Table 1.

Data from the focus groups and individual interviews were similar in providing individual, personal experiences, with the exception that the clinician’s focus group also discussed issues from the perspective of people providing community services. While there was some variation in responses between older women and younger women, as reported here, there was no clear pattern by parity or location. Women who had never smoked reported different personal experiences to those who smoked, but their views of the factors influencing smoking behaviour were similar to those who smoked.

Results on environmental factors influencing smoking are presented first, to provide the context for smoking behaviour, followed by the results specific to smoking initiation. In the following sections we elaborate on the four themes which provide insights into the social context in which Aboriginal girls in these communities start smoking: colonisation and the introduction of tobacco; separate Aboriginal social networks and normalization of smoking within these networks; disadvantage and stressful lives; and the importance of maintaining relationships.
Rich cultural and social norms surrounding smoking contributed to the high prevalence among Aboriginal women. These included cultural practices, family and community expectations, and the dynamics of social networks.

**Table 1 Characteristics of women interviewed (n = 22)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Mean (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>24.9</td>
<td>(17-41)</td>
</tr>
<tr>
<td>Educational status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 10 or less</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Year 11</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Certificate/diploma</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Income source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Welfare</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Pregnancy Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregnant now</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Recently pregnant</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Parity</td>
<td>2.1</td>
<td>(0-7)</td>
</tr>
<tr>
<td>Tobacco smoking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never smoked</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Quit during pregnancy</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Cut down during pregnancy</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>No change</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Increased</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Contextual factors contributing to the high prevalence of smoking**

**Colonisation and introduction of tobacco**

European colonisation created extensive disruption to Aboriginal society including dispossession of traditional lands, movement of people, removal of children, loss of traditional lifestyle and introduction of tobacco and alcohol [49]. The introduction of tobacco by Europeans together with other lifestyle changes, were raised by participants in each of the focus groups and by some older women in interviews. People no longer live traditionally and with the lifestyle changes, women reported less respect for elders and the loss of other traditional behavioural constraints. It was recognised that traditional smoking had occurred in other parts of Australia, but in the context of ritual and ceremony, with limits around smoking which no longer apply. Tobacco is now readily available with few social proscriptions on its use.

So there was things that were in place, there were controls put in place, whereas now we have no controls. Stuff comes in, anybody can smoke anything... there's no rituals.....

Clinician's focus group

We never had smoking from our previous ancestors, we never had smoking. It has a lot to do with Western society bringing it.... If it was never introduced, same as alcohol, then maybe we probably wouldn't have people smoking. yeah..... It's changed our whole way.

41 year old ex-smoker, mother of 6

**Social networks and community norms**

Despite mostly living in towns with large populations of non-Indigenous people, the Aboriginal population tends to remain relatively socially separated from the non-Indigenous population. This, combined with different social norms regarding smoking creates a situation where many people have limited interaction with non-smokers. The participants described very separate Aboriginal social networks embedded within the broader community. The CRG discussed this issue extensively and confirmed that local Aboriginal people mainly interact with other Aboriginal people. They indicated that this is partly due to a preference for socialising with relatives and others who share similar culture, values and history, and the strong social support gained through these networks. However, it was also thought to be due to experiences of exclusion or marginalisation from mainstream society in regard to participation in work, school and other civic activities. While some Aboriginal people in the community have jobs, many do not. For these people there are limited opportunities for interaction with the broader community’s social institutions and people, and the extent of social separation is greater.

The participants reported a high prevalence of smoking within the Aboriginal networks which then leads to a perception that smoking is normal and part of Aboriginal identity. The limited interaction with the broader community also limits exposure to non-smokers and to changing attitudes to smoking. Women reported that smoking was generally acceptable provided household rules around smoking outside or away from children or sick people were respected.

When you don’t smoke you stand out a bit, you feel a bit odd.... Cause everyone around you smokes. Everyone that I know smokes. Everyone in [town] who doesn't smoke. So like, it is a bit hard [not to smoke].

24 year old smoker

I reckon about 95 per cent of Koori people smoke........ Every household just about like I say, 95 percent have got people smoking.

33 year old smoker

**Disadvantage and stressful lives**

Women in these communities suffer from excessive levels of daily stress as a result of numerous social, emotional and financial pressures. High unemployment and associated poverty lead to difficulties finding affordable housing. Overcrowding is common as extended family and friends frequently stay for lengthy periods, exacerbating financial and social pressures. Relationship difficulties and loss of family members through death or removal of children further contribute to high stress

**Passey et al. BMC Women’s Health 2011, 11:55**

http://www.biomedcentral.com/1472-6874/11/55
levels. Participants considered that these frequent daily stressors contributed to the high prevalence of smoking and other substance use, as these were used to provide temporary relief.

Many participants spoke about grief and loss in their everyday lives. During the period of data collection there were many deaths in the Aboriginal community, including two of the participants. The frequent and often premature deaths mean that funerals become an everyday event, which both bind the community together and cause considerable grief. Several of the women interviewed had lost one or more of their parents as children, either through death or being removed from parental care. Others had experienced removal of their own children, and there were many stories of physical and sexual abuse of children. Many women had also experienced violence and/or sexual abuse as adults.

I was only with this bloke for 2 months - I got kicked out of my place, he had holes in my walls. I just left everything all my possessions,... and went to where I could get support from family..... Now back on my feet now all I need to do is get a place.

and

I was molested by the same people that looked after me, my mum's sister's husband. My mum died when I was like 8 and we didn't pretty much know dad. He died.... I nearly tried to kill myself.

Interviewer: And what did your aunty do...?
She didn't know nothing. I didn't tell her because she was dying of cancer..... I kept strong for her, held it in you know.

28 year old smoker

They also described experiences of perceived racism including difficulties finding housing and jobs, police harassment and being confronted with negative stereotypes. They felt this reflected the lack of interaction between Aboriginal and non-Indigenous people. The experience of racism, combined with grief and loss, ongoing violence, high unemployment and lack of housing, created high levels of stress in the women’s lives on an ongoing basis.

**Maintaining relationships and sharing**

Relationships with other members of the extended family and community are highly valued in Aboriginal culture and may be given priority over individual needs. Maintenance of these relationships involves considerable social interaction and reciprocity with obligations to share time and resources, including food and accommodation. Participants described extensive and complex relationships, both within the extended family and the larger Aboriginal community, with family and friendship networks extending over large geographic areas. Obligations to give cigarettes to others were described by nearly all participants and many also described an obligation to accept offered cigarettes. Sharing a cigarette and having a yarn, was an important social activity, contributing to a sense of belonging to the Aboriginal community.

While providing cigarettes to others was sometimes resented due to their high cost, they were seldom refused. Older women mentioned family arguments resulting from the obligation to share cigarettes, and themselves resorting to hiding part of a packet in order to reduce this obligation. The willingness to share appeared more common among younger women who possibly had fewer financial responsibilities or less established nicotine dependency.

**Don't believe in arguing over smokes, you got it, you give it, you don't, you can't.**

17 year old smoker

They'll ask (partner) and they'll get him on his own when I'm not around.... When he gives out smokes that's when I get shitty. Don’t give them smokes, come back here and gives us smokes first and then we'll give you a smoke, ’cause we ain't rich......

28 year old smoker

**Initiating smoking**

The 20 ever-smokers among the women interviewed individually reported starting at a mean age of 15 years (range 12-21) and becoming regular smokers at a mean age of 16 years (range 12-21). Every participant expressed the view that children were starting smoking at a younger age now than previously, with many children starting at age 12 or 13, and some starting younger.

Within the context of separate Aboriginal social networks, considerable disadvantage, and a high prevalence of smoking, young girls use smoking to attain status and assert their group membership and Aboriginal identity. Family and social structures, while providing strong supports, limit the capacity of individual parents to influence their children not to smoke, and provide children with ready access to cigarettes. The experience of marginalization is considered to contribute to limited opportunities and aspirations for young people, leading them to seek pleasure in the present rather than having goals for the future. We elaborate on these themes below.

**Peer influences and needing to belong, smoking as status**

Peer influences were manifested through girls wanting to be like others, socialise with them and belong to their group rather than through overt peer pressure. Transition from primary school to high school was a particularly vulnerable point where girls negotiated new relationships and used smoking as symbolic ‘adult’ behaviour to gain status and be accepted. In describing their own experiences, women emphasised the role of Aboriginal peers, particularly cousins and friends, in influencing them starting smoking. Most reported having their first cigarette because
of the social aspect of smoking, wanting to fit in with their friends and belong to the group. Some women reported having their first cigarette while drinking with friends or family and that smoking was just part of the whole social process. While most women did not feel pressured to start smoking, a few did describe feeling pressured, and despite not wanting to, smoking in order to belong. However, the emphasis expressed by the vast majority related to the desirability of belonging and participating in the social activities of the group, more than a pressure to smoke.

Friends, friends. Because when I first started smoking my influence was my friends were smoking and I thought well they're smoking so I've got to start smoking. Yeah, so it's more a friends thing, and sometimes it can be you see your parents do it as well.

24 year old, started age 15

Although they described some mimicry of smoking and experimentation with cigarettes among very young children, regular smoking among primary school children was uncommon and children would often tell adults they shouldn’t smoke. However, once children went to high school they rapidly took up the habit. Many participants felt that the main motivator among young high school students was to appear older, ‘cooler’ and to be accepted by older adolescents in the school. The transition to high school was difficult, particularly for children who didn’t engage well with the school system, and smoking was thought to be used by children to attain higher or ‘adult’ status.

Participant 1 As soon as they hit high school, that’s when they’re into it straight away.

Participant 2 Some of the young ones, like some young ones at home, that hang around with high school ones... and they think they’re real deadly and they’ll give them a couple of draws but they might not full on start, but once you get to high school - its gone!

Young women’s focus group

When I was a young girl, I was in this group and most were older than me and it was like a cool thing, all your friends are doing it. I felt left out so I just started asking. I thought I was a big woman [laugh]. I was only 13. I didn’t like it though

33 year old smoker

Development of identity

Growing up in a marginalised social group where smoking is a normalised and common behaviour, children are socialised to smoking from an early age and may incorporate it into their sense of identity. Internalisation of a smoking identity as part of their overall identity was described by many women and discussed by the CRG. For children growing up in Aboriginal families where smoking is common, smoking becomes incorporated into their identity and becomes blurred with their Aboriginal identity. The women felt that there was an unspoken expectation that children would become smokers.

Your mob smokes, so it’s in your blood to do it.

19 year old smoker

I dunno it’s almost expected isn’t it like?... I dunno, I never thought about that, but yeah. Probably it’s almost expected.

33 year old smoker

Social structure and parenting

The extended family structure and communal network among Aboriginal people are strong in both the geographically isolated communities and within the larger towns. Many households are large and fluid, with people coming and going, and extended family members of multiple generations living together for lengthy periods. Raising children is often communal, with extended family members or friends frequently caring for children. The social structure of Aboriginal communities and shared child-raising, when combined with the high smoking prevalence, was identified as contributing to children initiating smoking. Individual parents have less control over their own children’s behaviour, and there are fewer clear behavioural limits with children frequently exposed to many people smoking.

[People start smoking] younger in the Aboriginal community, because they’re all around each other.... all their family is one big family.... all together.... Most of the parents out there don’t teach their kids or it’s other people doing it for them. It’s other people because mainly someone’s always watching them.

23 year old smoker, mother of 2

Women expressed paradoxical views regarding parental ability to influence their children’s smoking behaviour. Although most women felt that the high prevalence of smoking among their parents and extended family had been influential in normalising smoking and making it more acceptable for them to start, they did not think that parents could influence children not to start smoking. Only one woman thought she would be able to influence her children not to smoke because neither she nor her partner smoked. Most women who were parents were resigned to the idea that their children would smoke.

Yeah I always think to myself I don’t want my boys to smoke cigarettes... but like if they’re going to do it then they’re going to do it. I can’t stop them from doing it. I’ll try, but I know I’m not going to be able to.

24 year old smoker, mother of 4

When asked where children obtained cigarettes the smokers reported that they had obtained cigarettes from friends and cousins, or by taking them from adults’ packets. The high prevalence of smoking, combined with the highly connected communal structure meant there were many possible sources of cigarettes. No one
was aware of shops which sold cigarettes to minors, but some reported adults buying packets for children, or giving them single cigarettes, particularly if they were related to them and felt obliged to share their cigarettes. Others reported that adults were less likely to give children cigarettes now than in the past, due to increased awareness of the problems with smoking.

### Lack of opportunity and present orientation

Limited opportunities for adolescents in rural towns and villages are exacerbated by marginalisation and felt more profoundly by disadvantaged groups with limited resources. Lack of opportunities may create boredom, limit aspirations and lead to a focus on immediate gratification. Participants believed that limited opportunities for Aboriginal children and adolescents in the region contributed to early initiation of smoking. In smaller communities, lack of local sports facilities combined with poor public transport, made it very difficult for children to engage in sports or other activities. The clinician’s focus group and some older women also thought that lack of employment prospects resulting from limited social connections and racism played a role, as it inhibited the ambitions of high school children. These children then perceived little benefit from applying themselves in school and had few aspirations for their future. The clinicians reported difficulty motivating children and adolescents, as it was difficult to demonstrate success.

**How are we supposed to stop people from having anything like that when, you know, it’s hard to even get them to keep going to school........ when they’re closer to leaving school age, and they know there’s nobody in their family or anybody has got a job...**

**Clinician’s focus group**

The boredom and lack of routine among unemployed adolescents who had left school also contributed, with some young people living hedonistic lifestyles with limited concern for the future. The participants in the young women’s focus group expressed an orientation toward pleasure rather than concern for their future health.

**Participant 1** That’s how you think - I’m going to die anyway, I might just do what I’m enjoying.

**Participant 2** Like we gunna die of something

**Participant 3** Yeah, instead of thinking ‘Oh, I could give up and go and have a really good, happy, healthy life and live longer’...... Like you don’t really think that way, you just think I enjoy this, I’m going to do it whatever.

**Young women’s focus group**

### Protective influences

Anti-smoking parental advice and role modelling; and success in school, sports or other activities provided a protective effect from early smoking initiation for girls. Involvement in competitive sports gave girls an incentive to keep fit, friends who were non-smokers and disapproved of smoking, and alternative ways to gain acceptability and status. Several women reported only initiating smoking after discontinuing competitive sports, and consequently had started later than the other participants. The women who had continued their education to year 10 or beyond had also started smoking later than women who left school earlier.

**Sport tends to help them. If they’re very into sport that usually will help them find another avenue, and also other non-smokers to go with. So it’s not cool then. They might say they’re bloody stupid or something.**

**Clinician’s focus group**

I started when I was 21.... I wish I was still fit, that I didn’t start smoking....because I never was interested in smoking, like I wasn’t even really into boys.... I was worried about school and my sport.

**24 year old smoker**

The two participants who had never smoked had been involved with sports, and one continued to play several sports. One also expressed concern with her health and emphasised the importance of her family influences - neither of her parents smoked and they had educated their children about the dangers of smoking, none of whom took up smoking. She described warning her own children about the dangers of smoking, and trying to ensure they weren’t exposed to other people’s smoke.

I didn’t like the stuff. And my parents made us aware of it growing up. They just, you know told us if you want to smoke you know it’s bad for your body, bad for your lungs and it’s better, best to be clean.

**25 year old, never smoked**

### Discussion

We used qualitative methods to explore Aboriginal women’s understandings of the social context of smoking and smoking initiation in rural communities in coastal NSW. The findings confirm the importance of the social and historical context in creating a pro-smoking environment with numerous external factors interacting with personal factors to drive the early initiation of smoking. Socio-economic disadvantage, housing shortages and high unemployment are associated with high levels of stress and contribute to the perpetuation of smoking. These findings support the importance of the social determinants of health in contributing to disparities in smoking rates. Further, they highlight the need to address these issues in strategies aimed at reducing Indigenous disadvantage [7,50,51].

The importance placed on maintaining relationships with the associated obligation to share resources was found to contribute to the high rates of smoking, consistent with earlier research [11-14,16]. Women derived clear social benefits from sharing cigarettes and a sense of belonging to the community through smoking. In
their work in two remote Northern Territory communities. Johnston & Thomas emphasised the value placed on reciprocity and sharing, and the role that cultural obligations play in smoking behaviour [14]. They argued that these cultural factors add another layer of complexity to social dynamics, resulting in qualitatively different drivers of smoking maintenance to those experienced by non-Indigenous disadvantaged groups with high smoking prevalence [14]. In our setting, Aboriginal people constitute a small minority of the population, and many come from other parts of Australia thus reducing kinship ties. However, the emphasis placed on sharing and reciprocity by our participants and the sense of connectedness and belonging to the Aboriginal community remained strong. Relative to remote communities, where Aboriginal people are usually in the majority, the situation for Aboriginal people in rural and urban Australia differs. Here, the experience of marginalization and cultural disruption is likely to be more complex [52]. In this context, the importance of smoking in establishing and maintaining group membership and Aboriginal identity is different, and may include stronger assertion of group identity.

In our setting, the separation of Aboriginal and non-Indigenous social networks was perceived to be important in both initiation and maintenance of smoking. Analysis of data from the Framingham Study demonstrated that smoking behaviour spreads through social networks, with smokers becoming increasingly socially marginalised [53]. In Australia, the role that separate social networks play in smoking behaviour among Aboriginal Australians has received little attention. However, research on psycho-social constructs mediating health behaviours related to cardiovascular disease in rural Victoria is of interest [54]. The authors identified the relationships that Aboriginal people have with the broader society as an important issue. Marginalisation, restricted access to mainstream services and institutions and racial stereotypes helped create separate social networks and impacted on health behaviours [54]. An exploration of social capital and identity among Indigenous people living in metropolitan Brisbane found that respondents had strong bonding social capital through their connections with family and the broader Indigenous community [55]. However, “In the context of an oppressive history and experiences of ongoing racism and discrimination, a second world of bridging social capital remains elusive to many Indigenous Australians” [55]. These findings resonate with our own in articulating the importance of Aboriginal identity in social network formation, and the role social networks play in perpetuating smoking behaviour, including initiating smoking.

Our findings on the perceived influences on initiating smoking emphasise the role of Aboriginal social networks in determining peer groups and the importance of smoking in order to belong to a these social groups. Arnett (2007), in his critique of the concept of peer influence, has argued that a more appropriate concept is that of peer context, which takes account of friendship selection in determining peer influences [56]. In our setting, Aboriginal children are largely forming friendships with other Aboriginal children in a marginalized social network where smoking is normalized. The choice of smoking then reflects a desire to fit in and belong to this group, driven by “self-pressure” [57]. Johnston & Thomas emphasised the importance of intergenerational transmission of smoking behaviour in remote Northern Territory communities, with initiation almost universally influenced by family smoking practices, rather than peers [14]. Similarities with our own study include the strong environmental cues for smoking and ready access to cigarettes. Smoking as a means of asserting membership in the Aboriginal community was not identified as an important factor in the Australian remote setting. This may be because Aboriginal people form the majority in remote communities, and thus ‘normalisation’ of smoking works through a different mechanism. Shared care of children also limits the amount of control parents are able to exert over their own children’s behaviour and their children’s exposure to other people smoking. A similar problem has been described in Canadian First Nations reserve communities, where family obligations and crowded housing create difficulties for women in reducing children’s smoke exposure [51].

In a review of the social context of smoking, Poland et al (2006) emphasised the importance of viewing smoking as a collective social practice, rather than just individual behaviour. They also highlighted the role of power relations in increasing social disparities in smoking behaviour; and the role of behaviour, including smoking, in constructing and maintaining a social identity [58]. In our study, lack of power and the experience of discrimination and marginalisation were perceived to work through several mechanisms to increase smoking initiation. These mechanisms included social separation from the broader society; a reduction in children’s aspirations; and children feeling disconnected from their schools leading them to smoke to attain status. Smoking was also used to establish an identity and group membership. Dixon & Banwell (2009) recently reviewed the application of social theories to understanding the temporal spread of health risk behaviours, in particular the spread of smoking, among different social groups [59]. They drew on Bourdieusian concepts to explain the persistence of smoking among some disadvantaged groups and proposed a fifth phase to the smoking transition model proposed by Lopez et al [60]. In this fifth phase, successive cohorts of disadvantaged groups continue to
adopt smoking despite widespread recognition of the harms. They suggest that intergenerational transmission of ‘habitus’, or way of life, combines with ‘doubling’ or copying others in the same social group, and the need for ‘distinction’ from other groups, to explain this continued initiation of harmful behaviours. Our own study provides some support for this, in that girls are thought to initiate smoking by adopting the behaviour of others within their social grouping, in order to assert their identity and membership of that group, and distinguish themselves from others.

Limitations and strengths
This study is one of the first that has explored the social context of smoking and smoking initiation among Aboriginal people in rural Australia, shedding new light on this important issue. The study benefited from input from Aboriginal women from its inception, including having a respected Aboriginal woman conduct all interviews. Assistance and input from the CRG helped optimise cultural security and the exploration and interpretation of key concepts. Additionally, local community engagement was enhanced by providing verbal feedback and a brief written report which was widely circulated.

The findings from this study must be considered within several limitations. The study was conducted in a limited geographic area and may not reflect the experiences of Aboriginal women elsewhere as there is considerable variation between Aboriginal communities. However, some of the issues identified relating to the social context may be similar in other rural Indigenous communities in Australia. We focused on female smoking and perspectives, with the majority of participants being poorly educated and unemployed. Capturing the voices of this marginalised group of women is valuable. However, it is likely that more educated, employed women may have different experiences [50] and it is important that experiences of these women and of men are explored in future studies. Additionally, we were unable to recruit many non-smokers and their story is clearly important for future research. A further limitation of the present study design is that smoking initiation may have taken place a long time in the past, given that the age of our interviewees ranged from 17 to 41 years. Contemporary influences and experiences of Aboriginal girls may differ and further research to extend our insights would be valuable.

Conclusions
Through listening to the stories of Aboriginal women and their health care providers, findings from this study provide insights into social and cultural influences concerning smoking initiation and maintenance by Aboriginal girls and women. The findings support the importance of addressing contextual factors in any strategies aimed at preventing smoking initiation or supporting cessation among Aboriginal women. Recognising the perceived benefits of smoking and finding alternative ways for young women to feel included and positive about a meaningful future are essential. This will include supporting them through school transitions and improving educational and employment opportunities. Community involvement is necessary to shift norms and expectations regarding smoking among Aboriginal people, with recognition that cigarette smoking is not part of traditional Aboriginal culture. Movement forward on this health issue will require acknowledgment of the importance of Aboriginal identity and culture as a source of strength and empowerment, while recognising the role of history, dispossession and persistent marginalization in perpetuating social and financial disadvantage and contributing to the high prevalence smoking.

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Authors’ contributions
MP designed the study and coordinated all phases, conducted the focus groups (jointly), oversaw data management, undertook the data analysis and interpretation, and drafted the paper. JG assisted with design, data collection, interpretation of the data and editing the paper. RSF contributed to study design, data interpretation and editing the paper. All authors read and approved the final manuscript.

Declaration of competing interests
The authors declare that they have no competing interests.

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References


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1.1.1 Statements of contribution from co-authors (for Paper One)
Statement Regarding Candidate Contribution

I, Robert William Sanson-Fisher, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed substantially in terms of initial conception of the study; study design and coordination; conduct of focus groups (jointly); data management; data analysis, manuscript drafting and revisions to the publication:


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Statement Regarding Candidate Contribution

In keeping with guidelines relating to publications, it is acknowledged that Megan Elizabeth Passey, a Research Higher Degree candidate, contributed the following components to the study and publication entitled "It's almost expected: Influences on smoking initiation and maintenance among Aboriginal women in rural Australia": initial conception of the study; study design and coordination; conduct of focus groups (jointly); data management; data analysis and drafting of the paper.

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1.2 Published Paper Two
Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions

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Abstract

Introduction and Aims. Smoking rates are three times as high for pregnant Indigenous women relative to non-Indigenous women, in Australia. This paper describes Indigenous women’s self-reported antenatal smoking behaviour and compares knowledge and attitudes of those who: (i) smoke and don’t smoke during pregnancy; and (ii) quit or continued to smoke since the beginning of pregnancy. Design and Methods. Cross-sectional surveys with 264 pregnant Indigenous women in two states collected data on smoking status, antenatal changes, risk knowledge, attitudes to smoking and sociodemographic characteristics. Multivariable logistic regression analyses assessed associations between knowledge and attitude variables and smoking status and antenatal changes in smoking status. Results. Forty-six per cent of the women (n = 121) reported currently smoking. The majority (68%) who smoked at the beginning of pregnancy reported quitting (21%) or reducing (47%). Relative to smokers, non-smokers had more schooling (P = 0.002), more post-secondary education (P = 0.023), lower parity (P = 0.003), better understanding of smoking-related risks (miscarriage P = 0.01; low birth weight P = 0.003; infant illness P < 0.001; childhood behavioural problems P = 0.007), and less frequently expressed attitudes indicating that quitting was very difficult given other problems they faced. Similar patterns were found for women who quit during pregnancy compared to those who continued smoking. Discussion and Conclusions. Increasing awareness of antenatal smoking risks and the benefits of quitting may motivate women to attempt to quit. However, knowledge alone is unlikely to be sufficient considering the life circumstances of many Indigenous women. Addressing the social environment and daily stressors, particularly those exacerbated by pregnancy, may be critical to supporting quit attempts. [Passey ME, D’Este CA, Stirling JM, Sanson-Fisher RW. Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions. Drug Alcohol Rev 2012;31:608–616]

Key words: health behaviour, harm reduction, Australia, pregnancy, Indigenous.

Introduction

The last few decades have seen considerable reductions in the prevalence of smoking in the general Australian population [1,2]. This benefit has not been shared by the Aboriginal and Torres Strait Islander (hereafter referred to as Indigenous) population, with the prevalence of smoking persisting above 50% for many years, although there has been a recent slight reduction [3,4]. Similarly, despite declining smoking rates among pregnant women generally, rates among pregnant Indigenous women remain three times those of non-Indigenous Australians (52% compared to 15%) [5]. Factors which may contribute to these disparities include socioeconomic disadvantage, marginalisation, stressful life circumstances, acceptability and normalisation of smoking within Indigenous social networks and the role of tobacco in social exchange [6–10].

The harms associated with smoking during pregnancy include risks to both mother and baby: higher rates of placental problems, low birth weight, preterm birth, intrauterine growth retardation and perinatal death [11–13]. Pregnancy is a time when many women are motivated to modify their behaviour [14]. However, smoking during pregnancy among Indigenous women...
remains common and perinatal data indicate low quit rates [15].

There is little assistance from the published literature to guide development of effective interventions to address antenatal smoking among Indigenous women [16]. Only two studies have assessed Indigenous women’s knowledge and attitudes to smoking during pregnancy [9,17]. A survey of pregnant Indigenous women in North Queensland found generally good knowledge of risks, with few differences between smokers and non-smokers on knowledge or attitude items [17]. By contrast, a qualitative study in Perth found women’s specific knowledge of risks to be poor, and that pregnancy had little impact on attitudes to cessation, with most women preferring to reduce the number of cigarettes smoked as the benefits of smoking outweighed those of quitting [9]. In order to develop effective strategies to reduce the harms from antenatal smoking, a greater understanding of the patterns of use, and of women’s attitudes and knowledge of risks is needed.

**Aims**

This paper:

1. Describes pregnant Indigenous women’s self-reported smoking behaviour during pregnancy.
2. Compares the knowledge and attitudes of those who:
   a. Smoke and don’t smoke during pregnancy.
   b. Quit smoking, and those who continue, among women smoking at the beginning of pregnancy.

**Methods**

This paper uses data from two cross-sectional surveys with pregnant Indigenous women—one from the Northern Territory (NT) and one from New South Wales (NSW). Both surveys used the same questionnaire. The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW.

**Recruiting participants**

**Northern Territory.** Women attending the antenatal clinic at Royal Darwin Hospital were invited to participate by a female Aboriginal research assistant from July to September 2010 and April to June 2011. The NT Department of Health and Family (DHF) policy recommends that women give birth in a regional hospital [18]. The majority of women from remote communities in the Top End of the NT are transferred to Darwin for their baby’s birth and attend Royal Darwin Hospital for antenatal care in the last part of their pregnancy [19].

**New South Wales.** At the time of the study, Aboriginal Maternal and Infant Health Strategy teams provided antenatal care at 28 sites across NSW. All teams were invited to participate through their management structure and 22 agreed. Women receiving antenatal care at these sites were invited by the midwife or Aboriginal Health Worker to participate from July to December 2009. The number of women to be recruited by each team varied depending on the team size and their catchment population, from 5 to 20 women.

In both NSW and the NT, women were eligible if they were pregnant and if they or their partner were Indigenous (Aboriginal and/or Torres Strait Islander). They were excluded if they were aged less than 16 years; being treated for mental illness; or unable to provide informed consent. The staff explained the study to eligible women and provided them with information sheets. Those willing to participate completed a consent form and written questionnaire. Assistance to complete the questionnaire was offered. Staff were asked to invite all eligible women to participate and to complete a recruitment log to track participation rates.

**Questionnaire development and contents**

**Literature review.** Concepts included were derived from a review of published literature on smoking during pregnancy and/or among Indigenous peoples [6,7,9,14,17,20–26]. Questions regarding knowledge of risks and attitudes towards smoking during pregnancy were adapted from a questionnaire used with pregnant Indigenous women [17].

**Consultation with professionals working in Indigenous health.** The draft questionnaire was critically reviewed by several groups to assess content validity, reduce redundancy and refine the wording of questions to ensure cultural appropriateness. These groups included the CRG, the NT DHF and colleagues experienced in Indigenous health research, tobacco control and questionnaire design. Minor revisions were made, with removal of some redundant questions and addition of others.

**Pilot testing.** The revised questionnaire was piloted with 15 pregnant Indigenous women in NSW and Western Australia. Feedback from these women was discussed by the CRG with further minor changes made to the questionnaire.

The final questionnaire had a Flesch–Kincaid reading level of grade 6 and took approximately 15–20 min to complete. The items covered:
• Demographic and obstetric characteristics: age, ethnicity, education, if the pregnancy was planned, gestation, parity and number of prior antenatal visits.
• Self-reported current smoking status and changes in pregnancy: smoking status—current daily smoker, occasional smoker, ex-smoker or had never smoked. Those who were current or ex-smokers were asked the amount they smoked, whether they had had a cigarette in the last 7 days (even a puff), the age they started smoking, and changes to their smoking status or quantity since becoming pregnant (increased, same, decreased or quit completely).
• Knowledge of risks and attitudes to smoking during pregnancy: questions were presented as statements and participants were asked to indicate if they agreed, disagreed or weren’t sure if the statement was correct.
• Assistance completing the questionnaire.

Statistical methods

The questionnaires were computer-scannable. Data were analysed using Stata 9.2 (StataCorp, College Station, TX, USA). Summary statistics of respondent characteristics were obtained. Age and years of school were categorised, and the number and percentage in each category reported. Gestation, parity and number of antenatal visits are presented as medians because of non-normal distributions. Smoking status and changes in pregnancy are reported as proportions with 95% confidence intervals (CIs).

Based on self-reported smoking status at the time of the survey, women were categorised as current smokers (daily or occasional smokers) or non-smokers (ex-smokers or never smokers). Based on reported changes during pregnancy, women smoking at the beginning of pregnancy were categorised as having ‘quit’ or ‘continued’ smoking. These categories are shown in Figure 1.

The number and percentage in each of these two groups agreeing with each knowledge and attitude statement are presented.

Univariate associations with reported smoking status and changes in pregnancy were examined using the Pearson’s chi-square test for categorical explanatory variables and the non-parametric Mann-Whitney test for continuous explanatory variables. Multivariable logistic regression was used to determine associations between knowledge and attitude variables and smoking status; and between knowledge and attitude variables and changes in smoking status during pregnancy, when controlling for potential confounders and adjusting for clustering by site (see Figure 1). Demographic and obstetric variables found to be significantly associated with smoking status (P-value <0.05) were included in multivariable models as potential confounders. State was also included in the multivariable models.

We aimed to recruit 220 women from NSW and 180 from the NT. This would allow an estimate of the prevalence of current smoking with 95% CI within ±7% of the point estimate and detection of differences in characteristics and attitudes between smokers and non-smokers of 15% or more, and between quitters and non-quitters of 20% or more, with 80% power and 5% significance level.

Ethical approval

The NT survey was approved by the Human Research Ethics Committees of the University of Newcastle and the NT Department of Human Services and Menzies School of Health Research. The NSW survey was approved by the University of Newcastle, Hunter New England and the Aboriginal Health and Medical Research Council Human Research Ethics Committees.

Results

A total of 264 women completed questionnaires. In the NT, 137 women were invited of whom 107 (78%)
agreed. In NSW, 157 women completed questionnaires. Of these, 128 were from the 15 sites which returned participation records documenting the number of women approached and consenting. These sites had invited 146 women, giving a response rate from these sites of 88%. The remaining seven sites returned 29 completed questionnaires but did not return participation records; thus the consent rate is unknown for these sites. Seventy-three women (28%) had assistance completing the questionnaire.

Respondent smoking status and characteristics

Respondents’ characteristics by current self-reported smoking status are shown in Table 1. One hundred and twenty-one women (46%; 95% CI: 40%, 52%) reported currently smoking daily ($n = 85$, 32%; 95% CI: 27%, 38%) or occasionally ($n = 36$, 14%; 95% CI: 10%, 18%). Fifty-six (21%; 95% CI: 16%, 27%) were ex-smokers and 87 (33%; 95% CI: 27%, 39%) had never smoked cigarettes. Among the 177 women who had ever smoked, 116 (66%) reported smoking in the previous 7 days and the mean age of initiation was 15.2 years. Current smokers reported smoking an average of 10 cigarettes per day.

Smokers reported significantly fewer years schooling and were less likely to have any post-secondary education than non-smokers (Table 1). Smokers had higher parity and were less likely to be primiparous relative to non-smokers, with 56 (40%) non-smokers being primiparous, compared to only 29 (24%) smokers ($\chi^2 = 6.93; P = 0.008$).

Changes in smoking during pregnancy

The majority of women [$n = 99$ (68%), 95% CI: 60%, 75%] who were smoking at the beginning of the current pregnancy reported either quitting completely or reducing (Table 2). There were 17 women (12%) who

---

**Table 1. Characteristics of survey respondents by current smoking status ($n = 264^a$)**

<table>
<thead>
<tr>
<th></th>
<th>Smokers ($n = 121$)</th>
<th>Non-smokers ($n = 143$)</th>
<th>Total ($n = 264$)</th>
<th>$P$-value$^b$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indigenous</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>79 (65)</td>
<td>78 (55)</td>
<td>157 (60)</td>
<td>0.076</td>
</tr>
<tr>
<td>NT</td>
<td>42 (35)</td>
<td>65 (45)</td>
<td>107 (41)</td>
<td></td>
</tr>
<tr>
<td><strong>State</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age group (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>22 (18)</td>
<td>35 (24)</td>
<td>57 (22)</td>
<td>0.358</td>
</tr>
<tr>
<td>20–24</td>
<td>41 (34)</td>
<td>46 (32)</td>
<td>87 (33)</td>
<td></td>
</tr>
<tr>
<td>25–29</td>
<td>33 (27)</td>
<td>28 (20)</td>
<td>61 (23)</td>
<td></td>
</tr>
<tr>
<td>≥30</td>
<td>25 (21)</td>
<td>34 (24)</td>
<td>59 (22)</td>
<td></td>
</tr>
<tr>
<td><strong>Highest year at school</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>47 (40)</td>
<td>30 (22)</td>
<td>77 (30)</td>
<td>0.002</td>
</tr>
<tr>
<td>10–11</td>
<td>57 (48)</td>
<td>77 (55)</td>
<td>134 (52)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>14 (12)</td>
<td>32 (23)</td>
<td>46 (18)</td>
<td></td>
</tr>
<tr>
<td><strong>Post-secondary education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40 (33)</td>
<td>67 (47)</td>
<td>107 (41)</td>
<td>0.023</td>
</tr>
<tr>
<td><strong>Planned pregnancy</strong></td>
<td>28 (24)</td>
<td>46 (33)</td>
<td>74 (29)</td>
<td>0.107</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Median (Q1, Q3)</th>
<th>Median (Q1, Q3)</th>
<th>Median (Q1, Q3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestation</td>
<td>30 (21, 37)</td>
<td>30 (22, 36)</td>
<td>30 (22, 36)</td>
</tr>
<tr>
<td>Parity</td>
<td>2 (1, 3)</td>
<td>1 (0, 2)</td>
<td>1 (0, 2.5)</td>
</tr>
<tr>
<td>Antenatal midwife visits</td>
<td>3 (2, 5)</td>
<td>3 (2, 6)</td>
<td>3 (2, 6)</td>
</tr>
<tr>
<td>Antenatal doctor visits</td>
<td>3 (2, 5)</td>
<td>4 (2, 6)</td>
<td>3 (2, 6)</td>
</tr>
</tbody>
</table>

$^a$Numbers may not add to 264 due to missing values. $^b$P-value for Pearson’s $\chi^2$-test for categorical variables and the non-parametric Mann–Whitney test for continuous explanatory variables. NSW, New South Wales; NT, Northern Territory.

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**Table 2. Self-reported changes in smoking during the current pregnancy among women smoking at the beginning of the pregnancy ($n = 146^c$)**

<table>
<thead>
<tr>
<th></th>
<th>$n$ (%)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased</td>
<td>17 (12)</td>
<td>7%, 18%</td>
</tr>
<tr>
<td>Stayed the same</td>
<td>30 (21)</td>
<td>14%, 28%</td>
</tr>
<tr>
<td>Reduced</td>
<td>69 (47)</td>
<td>39%, 56%</td>
</tr>
<tr>
<td>Quit completely</td>
<td>30 (21)</td>
<td>14%, 28%</td>
</tr>
</tbody>
</table>

$^c$Five current smokers did not answer this question. CI, confidence interval.
reported increasing the number of cigarettes smoked since becoming pregnant.

**Knowledge of risks and attitudes to smoking**

*Smokers and non-smokers.* Table 3 compares the knowledge and attitudes of women by their reported smoking status at the time of the survey. There were significant differences in knowledge of risks associated with smoking during pregnancy, with non-smokers more likely to agree that smoking increased the risk of each adverse outcome presented. There were also significant differences between smokers and non-smokers on several attitudinal items (Table 3).

Quitters and continuing smokers. Table 4 presents a similar comparison of knowledge and attitudes by reported quitting status, among women who smoked at the beginning of pregnancy. For the variables related to knowledge of risk, there were large differences between the groups, but this difference was only significant at the 5% level for miscarriage. This is likely due to the

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**Table 3. Smokers’ and non-smokers’ knowledge of risks and attitudes towards smoking tobacco during pregnancy, controlling for confounders and adjusting for clustering (n = 260)**

<table>
<thead>
<tr>
<th>Knowledge of risks</th>
<th>Smokers (n = 119)</th>
<th>Non-smokers (n = 141)</th>
<th>Adjusted OR&lt;sup&gt;b&lt;/sup&gt; (95% CI)</th>
<th>P-value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking tobacco during pregnancy increases the risk of:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscarriage (losing the baby)</td>
<td>63 (53)</td>
<td>104 (74)</td>
<td>0.4 (0.26, 0.71)</td>
<td>0.001</td>
</tr>
<tr>
<td>Low birth weight of baby</td>
<td>82 (69)</td>
<td>116 (83)</td>
<td>0.5 (0.33, 0.79)</td>
<td>0.003</td>
</tr>
<tr>
<td>Breathing problems and sickness in infant</td>
<td>79 (66)</td>
<td>119 (85)</td>
<td>0.4 (0.25, 0.58)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Mother having high blood pressure and increased heart rate&lt;sup&gt;c&lt;/sup&gt;</td>
<td>64 (54)</td>
<td>108 (77)</td>
<td>0.4 (0.24, 0.58)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Behavioural problems in childhood</td>
<td>41 (35)</td>
<td>78 (56)</td>
<td>0.5 (0.26, 0.81)</td>
<td>0.007</td>
</tr>
</tbody>
</table>

**Attitudes**

<table>
<thead>
<tr>
<th></th>
<th>Smokers (n = 119)</th>
<th>Non-smokers (n = 141)</th>
<th>Adjusted OR&lt;sup&gt;b&lt;/sup&gt; (95% CI)</th>
<th>P-value&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>It’s good to have a smaller baby</td>
<td>13 (11)</td>
<td>7 (5.0)</td>
<td>2.7 (0.62, 11.69)</td>
<td>0.189</td>
</tr>
<tr>
<td>I think my baby will be born healthy</td>
<td>97 (82)</td>
<td>128 (93)</td>
<td>0.4 (0.11, 1.24)</td>
<td>0.109</td>
</tr>
<tr>
<td>Light smoking does not cause harm to unborn babies</td>
<td>23 (20)</td>
<td>16 (11)</td>
<td>1.7 (0.80, 3.81)</td>
<td>0.161</td>
</tr>
<tr>
<td>Stopping smoking increases the chance of having a healthy baby</td>
<td>77 (65)</td>
<td>122 (87)</td>
<td>0.31 (0.17, 0.57)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>If you are around a lot of smoke from other people you might as well keep smoking yourself</td>
<td>41 (35)</td>
<td>39 (28)</td>
<td>1.3 (0.74, 2.40)</td>
<td>0.340</td>
</tr>
<tr>
<td>It’s OK to drink alcohol when you’re pregnant as long as you don’t drink a lot</td>
<td>26 (17)</td>
<td>14 (10)</td>
<td>1.7 (0.96, 2.95)</td>
<td>0.070</td>
</tr>
<tr>
<td>Quitting smoking is just too hard. It’s not worth the effort</td>
<td>25 (21)</td>
<td>6 (4.3)</td>
<td>5.5 (1.60, 18.82)</td>
<td>0.007</td>
</tr>
<tr>
<td>Cannabis&lt;sup&gt;d&lt;/sup&gt; is OK when you’re pregnant because it’s natural</td>
<td>8 (6.8)</td>
<td>2 (1.4)</td>
<td>4.8 (0.97, 23.96)</td>
<td>0.054</td>
</tr>
<tr>
<td>It’s harder to quit smoking during pregnancy because of all the worries</td>
<td>60 (50)</td>
<td>15 (11)</td>
<td>7.9 (4.34, 14.45)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>You’ve got to die of something, so why give up the things you enjoy?</td>
<td>24 (20)</td>
<td>5 (3.6)</td>
<td>6.3 (3.00, 13.08)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Women will try to give up smoking and drinking for their children even if they won’t try for themselves</td>
<td>61 (51)</td>
<td>62 (44)</td>
<td>1.3 (0.98, 1.79)</td>
<td>0.065</td>
</tr>
<tr>
<td>In our community it’s OK to smoke when you are pregnant</td>
<td>29 (25)</td>
<td>20 (14)</td>
<td>2.2 (1.16, 4.20)</td>
<td>0.016</td>
</tr>
<tr>
<td>Most women have bigger problems to deal with than trying to quit smoking and drinking</td>
<td>47 (40)</td>
<td>21 (16)</td>
<td>3.2 (1.78, 5.69)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Health-care providers should tell pregnant women to quit smoking tobacco</td>
<td>89 (75)</td>
<td>107 (77)</td>
<td>0.8 (0.45, 1.40)</td>
<td>0.423</td>
</tr>
<tr>
<td>Health-care providers should tell pregnant women to quit using alcohol and drugs</td>
<td>90 (77)</td>
<td>109 (78)</td>
<td>0.8 (0.40, 1.46)</td>
<td>0.404</td>
</tr>
</tbody>
</table>

<sup>a</sup>Two smokers and two non-smokers did not answer any of the knowledge and attitude questions. <sup>b</sup>OR and P-value (Wald test) for agreement with each item for smokers relative to non-smokers after controlling for years at school, post-secondary education, parity and state, and adjusting for clustering. <sup>c</sup>Smoking tobacco during pregnancy is not known to be associated with increased risk of high blood pressure. <sup>d</sup>Local colloquial names (yarni, gunja) for cannabis were used in the questionnaire. CI, confidence interval; OR, odds ratio.
Table 4. Knowledge of risks and attitudes towards smoking tobacco during pregnancy among smokers who reported quitting during pregnancy and those who continued smoking, adjusted for confounders (n = 149)

<table>
<thead>
<tr>
<th>Knowledge of risks</th>
<th>Quit smoking (n = 30)</th>
<th>Continued smoking (n = 119)</th>
<th>Adjusted ORb (95% CI)</th>
<th>P-valueb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agree</td>
<td>n (%)</td>
<td>Agree</td>
<td>n (%)</td>
</tr>
<tr>
<td>Miscarriage (losing the baby)</td>
<td>25 (83)</td>
<td>63 (53)</td>
<td>3.6 (1.28, 9.87)</td>
<td>0.015</td>
</tr>
<tr>
<td>Low birth weight of baby</td>
<td>26 (87)</td>
<td>82 (69)</td>
<td>2.3 (0.76, 6.72)</td>
<td>0.140</td>
</tr>
<tr>
<td>Breathing problems and sickness in infant</td>
<td>28 (93)</td>
<td>79 (66)</td>
<td>4.7 (0.93, 23.93)</td>
<td>0.061</td>
</tr>
<tr>
<td>Mother having high blood pressure and increased heart ratec</td>
<td>23 (77)</td>
<td>64 (54)</td>
<td>2.4 (0.98, 5.80)</td>
<td>0.055</td>
</tr>
<tr>
<td>Behavioural problems in childhood</td>
<td>17 (57)</td>
<td>41 (35)</td>
<td>2.2 (0.94, 5.21)</td>
<td>0.067</td>
</tr>
<tr>
<td>Attitudes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It’s good to have a smaller baby</td>
<td>1 (3.5)</td>
<td>13 (11)</td>
<td>0.3 (0.04, 2.0)</td>
<td>0.203</td>
</tr>
<tr>
<td>I think my baby will be born healthy</td>
<td>27 (93)</td>
<td>97 (82)</td>
<td>3.4 (0.82, 14.08)</td>
<td>0.091</td>
</tr>
<tr>
<td>Light smoking does not cause harm to unborn babies</td>
<td>1 (3.3)</td>
<td>23 (19)</td>
<td>0.2 (0.03, 1.57)</td>
<td>0.128</td>
</tr>
<tr>
<td>Stopping smoking increases the chance of having a healthy baby</td>
<td>27 (90)</td>
<td>77 (65)</td>
<td>3.3 (1.03, 10.33)</td>
<td>0.045</td>
</tr>
<tr>
<td>If you are around a lot of smoke from other people you might as well keep smoking yourself</td>
<td>9 (30)</td>
<td>31 (26)</td>
<td>0.8 (0.33, 1.79)</td>
<td>0.545</td>
</tr>
<tr>
<td>It’s OK to drink alcohol when you’re pregnant as long as you don’t drink a lot</td>
<td>2 (6.7)</td>
<td>20 (17)</td>
<td>0.4 (0.08, 1.68)</td>
<td>0.195</td>
</tr>
<tr>
<td>Quitting smoking is just too hard. It’s not worth the effort</td>
<td>0 (0)</td>
<td>25 (21)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Cannabis is OK when you’re pregnant because it’s natural</td>
<td>0 (0)</td>
<td>8 (6.8)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>It’s harder to quit smoking during pregnancy because of all the worries</td>
<td>2 (6.7)</td>
<td>60 (50)</td>
<td>0.07 (0.02, 0.36)</td>
<td>0.001</td>
</tr>
<tr>
<td>You’ve got to die of something, so why give up the things you enjoy?</td>
<td>2 (6.7)</td>
<td>24 (20)</td>
<td>0.4 (0.08, 1.50)</td>
<td>0.160</td>
</tr>
<tr>
<td>Women will try to give up smoking and drinking for their children even if they won’t try for themselves</td>
<td>15 (50)</td>
<td>61 (51)</td>
<td>0.8 (0.35, 1.87)</td>
<td>0.616</td>
</tr>
<tr>
<td>In our community it’s OK to smoke when you are pregnant</td>
<td>3 (10)</td>
<td>29 (25)</td>
<td>0.3 (0.09, 0.90)</td>
<td>0.032</td>
</tr>
<tr>
<td>Most women have bigger problems to deal with than trying to quit smoking and drinking</td>
<td>4 (13)</td>
<td>47 (40)</td>
<td>0.3 (0.07, 0.96)</td>
<td>0.044</td>
</tr>
<tr>
<td>Health-care providers should tell pregnant women to quit smoking tobacco</td>
<td>28 (93)</td>
<td>89 (75)</td>
<td>3.9 (0.59, 25.64)</td>
<td>0.158</td>
</tr>
<tr>
<td>Health-care providers should tell pregnant women to quit using alcohol and drugs</td>
<td>28 (93)</td>
<td>90 (77)</td>
<td>3.1 (0.37, 26.89)</td>
<td>0.294</td>
</tr>
</tbody>
</table>

aTwo of the continuing smokers did not answer any of the knowledge and attitude questions. bOR and P-value (Wald test) for agreement with each item for quitters relative to continuing smokers after controlling for years at school, post-secondary education, parity and state, and adjusting for clustering. cP-value for univariate Pearson’s χ²-test as logistic regression analysis not possible as smoking status predicts response to this item perfectly. dSmoking tobacco during pregnancy is not known to be associated with increased risk of high blood pressure. eLocal colloquial names (yarndi, gunja) for cannabis were used in the questionnaire. CI, confidence interval; OR, odds ratio.

small numbers and low power for these analyses. Only 63 (53%) of the women who continued to smoke agreed that smoking increased the risk of miscarriage compared to 83% of women who quit smoking. In relation to the attitudinal items, there were a number of significant differences, all of which were also significantly different between smokers and non-smokers. Only one item which was significant in the smoker/non-smoker comparison did not differ between quitters and continuing smokers—‘You’ve got to die of something, so why give up the things you enjoy’. However, the lack of significance was likely due to the small sample size.

Discussion

The results indicate that the majority of women reported attempting to reduce the harms associated with smoking during pregnancy by either quitting...
smoking completely or reducing the amount smoked. Non-smokers were more educated and of lower parity than continuing smokers. They also had better understanding of the risks associated with smoking, and were less likely to express attitudes which indicated that quitting was very difficult given the other challenges they faced including the worries associated with pregnancy (e.g. ‘quitting smoking is just too hard. It’s not worth the effort’; ‘Most women have bigger problems to deal with than trying to quit smoking . . . ’). Disturbingly, a small proportion of women reported increasing the amount they smoked during their pregnancy.

A North Queensland study with pregnant Indigenous women found no differences in risk knowledge between smokers and non-smokers, with differences on only one attitudinal item [27]. They also found no differences in education or parity by smoking status, but had a smaller sample limiting their ability to detect differences. The reasons for the differences in findings between their study and our own are unclear, but may include that our participants were younger, less educated and were drawn from a broader population (two jurisdictions, including rural and remote communities) with different knowledge and attitudes to a North Queensland city.

Knowledge of risks associated with antenatal smoking was poorer among women who continued to smoke than among non-smokers, despite controlling for education, parity and state. A study with pregnant women in 13 Hungarian cities found a high prevalence of smoking (51%) and a strong association between knowledge of risk and continued smoking [28]. Differences in perception of risk between pregnant smokers and non-smokers have been demonstrated in a range of populations [29–31]. Previous research with Indigenous people has indicated that despite wide recognition that smoking is bad for your health, knowledge of specific risks is poor [23,32,33], including among pregnant women [9,34]. In our study, the majority of women smoking at the beginning of pregnancy reported taking steps to reduce the associated harm to their foetus. Providing additional information on specific risks from smoking and the benefits of quitting may help motivate more women to quit smoking altogether. A parallel study with clinicians providing antenatal care to Indigenous women, also identified gaps in knowledge of risks, particularly in relation to ongoing problems in childhood [35]. Development of appropriate resources for use by antenatal providers may assist them to better explain the risks associated with antenatal smoking. Mass media messages addressing the harms of smoking during pregnancy would reinforce provider messages and raise awareness of these risks in the broader Indigenous community [8,16].

There is a wealth of literature indicating that disadvantaged women and those experiencing stressful lives have higher rates of smoking [36–38] and are less likely to quit while pregnant [39–45]. A socioeconomic gradient in smoking among Indigenous people [46], including pregnant Indigenous women [15,47] is also recognised. Similar to our own findings, a study among low income pregnant women in the United States found that, compared to continuing smokers, those who quit were more likely to disagree with the statement ‘Too many other problems in life to stop smoking’ and to perceive a greater risk to the foetus [29]. Gilligan et al. identified high levels of daily stress as an independent predictor of continuing smoking among Indigenous women [17]. The responses to the attitudinal variables related to stress in our study suggest that women who continue to smoke are experiencing stressful situations which make quitting smoking ‘just too hard’. This is born out in other studies among Indigenous people, in which stress is cited as a contributor to smoking and a major impediment to quitting [6,7,10,23,48], including among pregnant women [9,49]. These stressors include high rates of unemployment and consequent poverty, overcrowded homes, violence, relationship difficulties, impacts of colonisation, and grief and loss [6,7,10,23,48], with many of these issues exacerbated by a new pregnancy [9]. These high levels of stress may account for the increases in smoking reported by some women. Addressing underlying stressors in conjunction with smoking cessation support is likely to improve cessation outcomes. At a minimum this should include both emotional and practical support through sensitive inquiry about potential stressors, acknowledgement that these problems make quitting difficult, assistance with identified issues, and referral to other services as appropriate. Strategies shown to be successful with other low income pregnant and non-pregnant women should be evaluated with Indigenous women. These include skills training in coping strategies and problem solving [50–52] and support groups incorporating education, social support, relaxation and other stress reduction techniques [53]. Approaches that address multiple psychological and behavioural problems in an integrated and culturally sensitive approach, tailored to an individual woman’s needs, and using a combination of emotional and practical support, skills training, and psychological therapies [51] may yield the greatest benefit.

A number of limitations should be considered in interpreting our findings. Firstly, we relied on self-reported smoking status. Underreporting of smoking is likely, as a result of social desirability bias [54]. Secondly, the smaller than anticipated sample limited our ability to detect any but large differences, particularly in comparisons between women who quit smoking and those who continued. In both jurisdictions, recruitment was stopped because of timing constraints.
Thirdly, presenting respondents with a list of possible risks may overestimate their level of knowledge as women may want to appear knowledgeable and, if uncertain, err on the side of indicating agreement. Nonetheless, this approach enabled us to detect differences between smokers and non-smokers. Finally, in a cross-sectional survey any associations found cannot be considered causal. It is possible that the responses reflect a rationalisation by the respondents to explain their behaviour. Future longitudinal research would allow better understanding of the importance of the differences detected. However, an important strength of the study was the high response rate.

Conclusions

Increasing awareness of the risks of antenatal smoking, and the benefits of quitting may help motivate women to attempt to quit smoking, and increase community support for these quit attempts. Given that level of education was significantly associated with smoking status, this will need to be addressed in both non-school and school environments. However, knowledge alone is unlikely to be sufficient considering the difficult and stressful life circumstances experienced by many Indigenous women. Addressing the social environment and daily stressors they face, particularly those exacerbated by pregnancy, is critical to supporting quit attempts [8,9,17]. In the longer term, addressing the social determinants of health, including school retention, housing and employment is required.

Acknowledgements

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References


1.2.1 Statements of contribution from co-authors (for Paper Two)
Statement Regarding Candidate Contribution

I, Robert William Sanson-Fisher, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed detailed study design, instrument development, study coordination, ethical approvals, data collection, management and analysis, drafting of the paper, submission and response to the reviewers comments, for the paper:

Megan E Passey, Catherine A D’Este, Janelle M Stirling, Robert W Sanson-Fisher “Factors associated with antenatal smoking among Aboriginal and Torres Strait Islander women in two jurisdictions” published in Drug and Alcohol Review, 2012; 31:608-616.

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1.3 Published Paper Three
Tobacco, alcohol and cannabis use during pregnancy: Clustering of risks

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\textbf{ABSTRACT}

\textit{Background:} Antenatal substance use poses significant risks to the unborn child. We examined use of tobacco, alcohol and cannabis among pregnant Aboriginal and Torres Strait Islander women; and compared characteristics of women by the number of substances reported.

\textit{Methods:} A cross-sectional survey with 257 pregnant Indigenous women attending antenatal services in two states of Australia. Women self-reported tobacco, alcohol and cannabis use (current use, ever use, changes during pregnancy); age of initiation of each substance; demographic and obstetric characteristics.

\textit{Results:} Nearly half the women (120; 47\%\, 95\%CI:40\%, 53\%) reported no current substance use; 119 reported current tobacco (46\%; 95\%CI:40\%, 53\%), 53 (21\%; 95\%CI:16\%, 26\%) current alcohol and 38 (15\%; 95\%CI:11\%, 20\%) current cannabis use. Among 148 women smoking tobacco at the beginning of pregnancy, 29 (20\%; 95\%CI:14\%, 27\%) reported quitting; with 80 of 133 (60\%; 95\%CI:51\%, 69\%) women quitting alcohol and 25 of 63 (40\%; 95\%CI:28\%, 53\%) women quitting cannabis. Among 137 women reporting current substance use, 77 (56\%; 95\%CI:47\%, 65\%) reported one and 60 (44\%; 95\%CI:35\%, 53\%) reported two or three. Women using any one substance were significantly more likely to also use others. Factors independently associated with current use of multiple substances were years of schooling and age of initiating tobacco.

\textit{Conclusions:} While many women discontinue substance use when becoming pregnant, there is clustering of risk among a small group of disadvantaged women. Programmes should address risks holistically within the social realities of women’s lives rather than focusing on individual tobacco smoking. Preventing uptake of substance use is critical.

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1. Introduction

Antenatal substance use is associated with significant risks to the unborn child. Smoking tobacco increases the risk of low birth weight (LBW), pre-term birth, intra-uterine growth retardation (IUGR) and perinatal death (\textit{British Medical Association}, 2004). Alcohol is teratogenic and use during pregnancy may result in foetal alcohol syndrome as well as LBW, preterm birth and perinatal death (\textit{NHMRC}, 2009). While less well established, smoking cannabis is associated with adverse outcomes including LBW, preterm birth, IUGR and admission to the neonatal intensive care unit (\textit{Hayatbakhsh et al.}, 2012). Antenatal exposure to any of these substances is also related to adverse child behavioural and cognitive outcomes including Attention Deficit Hyperactivity Disorder, increased externalising behaviour and decreased cognitive function (\textit{Huizink and Mulder}, 2006).

In Australia, pregnant Aboriginal and Torres Strait Islander (hereafter referred to as Indigenous) women are more likely to smoke tobacco than non-Indigenous pregnant women, with 50\% of Indigenous women reporting smoking antenatally (Li \textit{et al.}, 2011). Smoking rates are also elevated among pregnant Indigenous women in Canada, New Zealand and the United States (\textit{Dixon \textit{et al.}}, 2009; \textit{National Center for Health Statistics}, 2012; \textit{The First Nations Information Governance Centre and First Nations Regional Health Survey (RHS)}, 2012). National data on antenatal alcohol and cannabis use is not available, however nearly one third of Indigenous Australian women aged 15–45 years report alcohol consumption at risky levels, and one in ten used cannabis in the last 12 months (\textit{Australian Institute of Health and Welfare}, 2011a). Studies among pregnant Indigenous Australian women have identified rates of alcohol consumption between nine and 38\% (\textit{Panaretto \textit{et al.}}, 2005; \textit{Rumbold \textit{et al.}}, 2011; \textit{Stewart and Li}, 2005; \textit{Zubrick \textit{et al.}}, 2004) and cannabis use between nine and 12\% (\textit{Panaretto \textit{et al.}}...
et al., 2005; Zubrick et al., 2004). High rates of substance use among Indigenous peoples have been attributed to social and historical factors including socio-economic disadvantage, marginalisation, impacts of colonisation and grief and loss (Gray et al., 2004; Sagers and Gray, 1998; Thomas et al., 2008).

Associations between use of these substances are well recognised. Alcohol consumption is associated with higher rates of tobacco and cannabis smoking and lower rates of smoking cessation (Australian Institute of Health and Welfare, 2011a; Hendricks et al., 2011). Similarly, the prevalence of tobacco smoking is higher among cannabis smokers, (Agrawal et al., 2012; Australian Institute of Health and Welfare, 2011a) including among Indigenous Australians (Clough, 2005).

Studies among pregnant women have examined relationships between use of tobacco and illicit drugs or alcohol, but few have specifically explored concurrent use of tobacco, alcohol and cannabis. Dutch women using cannabis in early pregnancy were more likely to use alcohol and tobacco during early pregnancy and continue to smoke tobacco (El Marrouni et al., 2008). Among pregnant Danish women, alcohol intake was associated with tobacco smoking, but too few women used cannabis to allow statistical testing (Kesmodel et al., 2003). English and Spanish studies have also found associations between antenatal use of cannabis, alcohol and tobacco (Ferguson et al., 2002; Friguls et al., 2012).

We identified only two studies exploring concurrent use of alcohol, tobacco and cannabis among pregnant Indigenous women. The Western Australian Aboriginal Child Health Survey interviewed mothers of children aged 0–17 years about substance use during their pregnancy, and reported high rates of use (tobacco 49%, alcohol 23% and cannabis 9%) with women using one substance also more likely to use others (Zubrick et al., 2004). A study among Canadian Inuit women reports high rates of use of each substance and strong associations between alcohol consumption and use of tobacco and cannabis (Muckle et al., 2011).

Given the significant harm associated with antenatal use of these substances and the high rates of use among non-pregnant Indigenous Australian women, better understanding of use during pregnancy is important in developing appropriate programmes to reduce the associated harms and improve birth outcomes.

This paper examines self-reported and concurrent use of tobacco, alcohol and cannabis among pregnant Indigenous women and compares characteristics of women by the number of current substances reported.

2. Methods

Cross-sectional surveys with pregnant Indigenous women were undertaken in the Northern Territory (NT) and New South Wales (NSW). The project was guided by a community reference group (CRG) of Aboriginal women and service providers from rural NSW to enhance cultural sensitivity.

2.1. Recruitment

2.1.1. Settings. 22 of 28 Aboriginal Maternal and Infant Health Strategy (AMHSS) teams, providing antenatal care in community settings agreed to participate. From July to December, 2009, eligible women receiving antenatal care at these sites were invited to participate by the midwife or Aboriginal Health Worker. Aboriginal Health Workers are health professionals who work in a range of roles within the health system to facilitate engagement between Indigenous Australians and the health system. Each site was asked to recruit five to 20 consecutive women, proportional to the number who received antenatal care in the previous year. A female Aboriginal research assistant recruited eligible women from the antenatal clinic of a major hospital from July to September 2010 and April to June 2011.

2.1.2. Client sample. Women were eligible if pregnant and if they or their partner were Indigenous. They were excluded if they were aged less than 16; being treated for mental illness; or unable to provide informed consent. The staff explained the study and provided eligible women with information sheets. Written consent was obtained. Recruitment staff offered assistance to complete the questionnaire if required. Staff completed a recruitment log to track participation rates but did not collect data on non-participants.

2.2. Questionnaire development and contents

Questionnaire development is described in detail elsewhere (Passay et al., 2012). In brief, it involved initial review of published literature on substance use during pregnancy and/or among Aboriginal peoples to develop the draft questionnaire. This was critically reviewed by the CRG and colleagues experienced in Aboriginal health research, tobacco control and questionnaire design, to assess face and content validity, reduce redundancy and refine the wording to ensure cultural appropriateness. Minor revisions included removal of some redundant questions and addition of others. The revised questionnaire was pilot-tested with 15 pregnant Aboriginal women in NSW and Western Australia. The CRG discussed feedback from these women, with further minor changes.

The final questionnaire had a grade 6 Flesch–Kincaid reading level and took 15–20 min to complete. The items relevant to this paper covered: (1) Demographic and obstetric characteristics: age, education, if the pregnancy was planned, gestation, parity, and number of antenatal visits; (2) Tobacco smoking status and changes during pregnancy: smoking status – current daily smoker, current occasional smoker, ex-smoker or never smoked. Current and ex-smokers were asked the age they started smoking, and changes to their smoking status since becoming pregnant; (3) Cannabis smoking status and changes during pregnancy: the same questions as for tobacco; (4) Alcohol consumption and changes during pregnancy: any alcohol in the previous month (never, only once, 2–4 times in the month, 2–3 times a week, or ≥4 times a week). Current and ex-drinkers were asked the age they started drinking and changes to drinking status in pregnancy.

2.3. Statistical analysis

Summary statistics of respondent characteristics were obtained. Age, years of school, parity and gestation were categorised, and the number and percentage in each category reported. The numbers of antenatal visits are presented as medians due to non-normal distribution.

For each substance (tobacco, alcohol, cannabis), women were classified as: current users; having quit during pregnancy; having quit prior to pregnancy; or never having used the substance, based on self-report. Women were also categorised as currently using zero, one, or two to three substances. Proportions in each category are presented with 95% confidence intervals. The age at which they first started smoking and, for cannabis, who had used too high a level of cannabis use was categorised into <15 years, 15 years or never.

Two-way tables were generated for each combination of substances. Odds ratios and exact 95% confidence intervals were generated to assess associations between use of one substance and use of each of the others, as well as between quitting one substance during pregnancy, and quitting each of the others.

Univariate associations of demographic and obstetric variables with number of substances currently used (0, 1, ≥2) were examined using Pearson’s chi-square test for categorical explanatory variables and the non-parametric Kruskal–Wallis test for continuous explanatory variables. Multinomial logistic regression was used to determine associations between explanatory variables and the number of substances used, adjusting for clustering by site. Initially, all variables with a p-value <0.25 in the univariate analyses were included in the model. Wald tests, adjusted for clustering of women within sites, were used to test the significance of each parameter estimate, with stepwise removal of variables with a p-value ≥0.1. Jurisdiction (state/territory) was retained regardless of statistical significance as the differences in social context between jurisdictions were considered important.

We aimed to recruit 400 women but only recruited 264 within the study period. This sample allowed estimation of the prevalence of current substance use with 95% confidence intervals within ±6% of the point estimate. Assuming that approximately a third of women would be in each of the three substance use categories (0, 1, ≥2), and with a design effect of 1.2, the study would be able to detect differences between groups of slightly more than 20%.

2.4. Ethical approval

The study was approved by the Human Research Ethics Committees of the University of Newcastle; Hunter New England Health; the Aboriginal Health & Medical Research Council; NT Department of Human Services and Menzies School of Health Research.

3. Results

At the hospital, 137 women were invited and 107 (78%) consented. At community sites, 157 women consented. Of these, 128 were from the 15 sites which returned participation records documenting the number of women approached and consenting. These sites had invited 146 women, giving a response rate of 88%. The remaining seven sites returned 29 questionnaires but no participation records; thus the consent rate is unknown for these sites. Of the 264 questionnaires returned, 257 had data on current use of all three substances and are used in this analysis.
The women had a median age of 23 years. Only 45 (18%) had completed year 12 at school (the final year of secondary school in Australia), with 75 (30%) not completing year 10. The majority (189, 77%) were greater than 20 weeks gestation, with 8% in their first trimester, 35% in their second trimester and the remaining 56% in their third trimester, although gestational age was missing for 11 women. Eighty two (32%) were primiparous and 73 (29%) reported that the pregnancy was planned.

3.1. Self-reported use of tobacco, alcohol and cannabis

3.1.1. Current use. Almost half the women (120 or 47%; 95%CI:40%, 53%) reported no substance use at the time of the survey. Tobacco was the most commonly reported substance currently used, with 119 (46%; 95%CI:40%, 53%) women smoking tobacco. 53 (21%; 95%CI:16%, 26%) drinking alcohol and 38 (15%; 95%CI:11%, 20%) smoking cannabis. Women currently smoking tobacco reported a mean of 10 cigarettes per day, while those currently smoking cannabis reported a mean of seven cones or joints per day.

3.1.2. Ever use. Tobacco was the most commonly reported substance ever used, with 162 (63%; 95%CI:57%, 69%) women having smoked tobacco, 141 (55%; 95%CI:49%, 61%) having drunk alcohol, and 84 (33%; 95%CI:27%, 39%) having smoked cannabis at some time.

3.1.3. Quitting during pregnancy. Among 148 women smoking tobacco at the beginning of their pregnancy, 29 (20%; 95%CI:14%, 27%) reported quitting prior to the survey; with corresponding figures being 80 of 133 (60%; 95%CI:51%, 69%) women quitting alcohol and 25 of 63 (40%; 95%CI:28%, 53%) women quitting cannabis.

3.2. Concurrent substance use

Of 137 women who reported currently using any tobacco, alcohol or cannabis, 77 (56%) used only one substance, while 60 (44%) used more than one. Fig. 1 shows the number of women reporting current use of each substance. Seven distinct groups were identified.

3.2.1. No substances. 120 women (47%) reported no current substances. Among these women, 64 (53%) had used one or more substances previously, with 24 (20%) quitting tobacco, 44 (37%) quitting alcohol and 12 (10%) quitting cannabis since becoming pregnant; 20 (17%), 11 (9%) and 10 (8%) had quit tobacco, alcohol and cannabis respectively, prior to becoming pregnant. Thirteen of these women reported being in their first trimester.

3.2.2. Tobacco only. 60 women (23%) reported current tobacco use only, with 26 (43%) of these having quit alcohol and seven (12%) having quit cannabis since becoming pregnant. Two of these women were in their first trimester.

3.2.3. Alcohol only. 13 women (5%) reported currently consuming alcohol only. One woman was in her first trimester.

3.2.4. Cannabis only. Five women (2%) reported only smoking cannabis. None of these women were in their first trimester.

3.2.5. Tobacco and alcohol only. 26 women (10%) reported current tobacco and alcohol use but not cannabis use. Two of these women were in their first trimester.

3.2.6. Tobacco and cannabis only. 20 women (8%) reported smoking both tobacco and cannabis but not consuming alcohol. None of these women were in their first trimester.

3.2.7. Tobacco, alcohol and cannabis. 13 women (5%) reported current use of all three substances. Two of these women were in their first trimester.

Only 18 (13%) women who did not currently smoke tobacco reported use of any other substance, compared to 59 (50%) women who smoked tobacco. Current tobacco smokers had higher odds of reporting current alcohol consumption (OR: 4.32; 95%CI:2.12, 9.13) and cannabis use (OR: 10.21; 95%CI:3.73, 34.52) than women who didn’t report current tobacco smoking. Women who reported alcohol consumption also had higher odds of reporting cannabis use than those who did not currently consume alcohol (OR: 2.69; 95%CI:1.17, 5.97).

Women who reported quitting tobacco since becoming pregnant had higher odds of also having quit alcohol (OR:5.32; 95%CI:1.52, 23.36) and cannabis (OR:12.69; 95%CI:1.19, 617.8) than women who had not quit tobacco. Similarly, women who quit alcohol had higher odds of also reporting quitting cannabis (OR:3.7; 95%CI:0.93, 15.8) than women who had not quit drinking ($\chi^2 = 4.51$, $p = 0.034$)

3.3. Characteristics of women by current number of substances reported

One hundred and twenty women (47%; 95%CI:40%, 53%) reported no current substances, while 77 (30%; 95%CI:24%, 36%) reported one and 60 (23%; 95%CI:18%, 29%) reported two or three. Characteristics of women by number of substances currently used are shown in Table 1. Jurisdiction of residence, years of schooling, post-secondary education (vocational training and/or university), and number of antenatal visits with a doctor were all significantly associated with number of substances. Starting to use tobacco, alcohol or cannabis when younger than age 15 were each significantly associated with number of substances currently used.
Table 1
Characteristics of respondents by level of reported current substance use (n = 257).

<table>
<thead>
<tr>
<th></th>
<th>No substances</th>
<th>1 substance</th>
<th>2–3 substances</th>
<th>p-Valueb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 120</td>
<td>n = 77</td>
<td>n = 60</td>
<td></td>
</tr>
<tr>
<td>Jurisdiction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>64 (53%)</td>
<td>46 (60%)</td>
<td>46 (77%)</td>
<td>0.010</td>
</tr>
<tr>
<td>Northern Territory</td>
<td>56 (47%)</td>
<td>31 (40%)</td>
<td>14 (23%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>30 (25%)</td>
<td>12 (16%)</td>
<td>13 (22%)</td>
<td>0.497</td>
</tr>
<tr>
<td>20–29</td>
<td>62 (52%)</td>
<td>47 (61%)</td>
<td>36 (60%)</td>
<td></td>
</tr>
<tr>
<td>≥30</td>
<td>28 (23%)</td>
<td>18 (23%)</td>
<td>11 (18%)</td>
<td></td>
</tr>
<tr>
<td>Highest year at schoola</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>25 (22%)</td>
<td>19 (25%)</td>
<td>31 (53%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>10–11</td>
<td>62 (53%)</td>
<td>43 (57%)</td>
<td>25 (42%)</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>29 (25%)</td>
<td>13 (17%)</td>
<td>3 (5.1%)</td>
<td></td>
</tr>
<tr>
<td>Post-secondary education</td>
<td>58 (48%)</td>
<td>33 (43%)</td>
<td>15 (25%)</td>
<td>0.011</td>
</tr>
<tr>
<td>Planned pregnancyc</td>
<td>37 (32%)</td>
<td>23 (32%)</td>
<td>13 (22%)</td>
<td>0.372</td>
</tr>
<tr>
<td>Gestation: &gt; 20 weeksd</td>
<td>24 (21%)</td>
<td>17 (23%)</td>
<td>16 (28%)</td>
<td>0.630</td>
</tr>
<tr>
<td>Primiparous</td>
<td>47 (39%)</td>
<td>21 (27%)</td>
<td>14 (23%)</td>
<td>0.058</td>
</tr>
<tr>
<td>Age started smoking tobaccoe</td>
<td>13 (11%)</td>
<td>15 (20%)</td>
<td>37 (65%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>&lt;15</td>
<td>27 (24%)</td>
<td>51 (68%)</td>
<td>19 (33%)</td>
<td></td>
</tr>
<tr>
<td>≥15</td>
<td>75 (65%)</td>
<td>9 (12%)</td>
<td>1 (1.8%)</td>
<td></td>
</tr>
<tr>
<td>Age started drinking alcoholf</td>
<td>8 (6.7%)</td>
<td>9 (12%)</td>
<td>21 (36%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>&lt;15</td>
<td>45 (38%)</td>
<td>34 (44%)</td>
<td>24 (41%)</td>
<td></td>
</tr>
<tr>
<td>≥15</td>
<td>67 (56%)</td>
<td>34 (44%)</td>
<td>13 (22%)</td>
<td></td>
</tr>
<tr>
<td>Age started smoking cannabisg</td>
<td>9 (7.6%)</td>
<td>5 (6.5%)</td>
<td>19 (32%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>&lt;15</td>
<td>12 (10%)</td>
<td>15 (20%)</td>
<td>24 (41%)</td>
<td></td>
</tr>
<tr>
<td>≥15</td>
<td>98 (82%)</td>
<td>57 (74)</td>
<td>16 (27)</td>
<td></td>
</tr>
<tr>
<td>Antenatal doctor visits</td>
<td>4 (2.6)</td>
<td>4 (2.6)</td>
<td>3 (2.5)</td>
<td>0.089</td>
</tr>
<tr>
<td>Antenatal midwife visits</td>
<td>4 (2.6)</td>
<td>4 (2.6)</td>
<td>3 (2.5)</td>
<td></td>
</tr>
</tbody>
</table>

a Missing data – school year = 7; planned pregnancy = 8; gestation = 9; antenatal doctor visits = 17; antenatal midwife visits = 22; age started smoking tobacco = 10; age started drinking alcohol = 2; age started smoking cannabis = 2.
b p-Value for Pearson’s chi-squared test for categorical variables; non-parametric Kruskal–Wallis test for continuous explanatory variables in which the median is presented.

3.4. Factors associated with the number of substances currently used

Multinomial logistic regression was used to identify factors independently associated with the number of different substances currently used by women, with ‘No substances’ as the reference group (Table 2). Never having started smoking tobacco was the only variable significantly associated with current use of one substance relative to use of none.

For current use of two or more substances, number of years of schooling and age of initiating tobacco use were significant. Among women who had 10 or 11 years of high school education, the odds of using two or more substances was one third that for women who had less than 10 years schooling, and for women who had completed year 12, the odds were 0.12, relative to those with less than 10 years. Women who started smoking tobacco at age 15 or more had odds of reporting two or more substances approximately one third that of women who started smoking before turning 15. Women who had never smoked tobacco had extremely low odds (OR = 0.01, 95% CI:0.001, 0.053) of currently using two or more substances.

4. Discussion

This paper is the first we are aware of to explore concurrent use of tobacco, alcohol and cannabis during pregnancy among Indigenous Australian women. Nearly half the women reported currently not using any of these substances and many had quit at

Table 2
Multinomial model of associations with number of current substances reported, with no substances as the reference group (n = 240).*

<table>
<thead>
<tr>
<th></th>
<th>OR</th>
<th>95% CI</th>
<th>p-Valuec</th>
<th>OR</th>
<th>95% CI</th>
<th>p-Valuec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdiction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern Territoryb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>0.88</td>
<td>0.398, 1.932</td>
<td>0.745</td>
<td>1.42</td>
<td>0.510, 3.941</td>
<td>0.503</td>
</tr>
<tr>
<td>Highest year at school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10</td>
<td>0.93</td>
<td>0.395, 2.182</td>
<td>0.865</td>
<td>0.33</td>
<td>0.116, 0.933</td>
<td>0.037</td>
</tr>
<tr>
<td>10–11</td>
<td>0.76</td>
<td>0.342, 1.697</td>
<td>0.505</td>
<td>0.12</td>
<td>0.018, 0.772</td>
<td>0.026</td>
</tr>
<tr>
<td>Age started smoking tobacco</td>
<td>1.56</td>
<td>0.663, 3.646</td>
<td>0.310</td>
<td>0.30</td>
<td>0.124, 0.710</td>
<td>0.006</td>
</tr>
<tr>
<td>&lt;15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥15</td>
<td>0.11</td>
<td>0.032, 0.361</td>
<td>&lt;0.001</td>
<td>0.01</td>
<td>0.001, 0.053</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

* 17 women had data missing on at least one of the included variables.

b Reference category.

Variables with p-value < 0.05 from the Wald test are shown in bold.

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least one substance since becoming pregnant. However, over half reported current use of at least one substance, with tobacco the most common (46%) followed by alcohol (21%) and cannabis (15%). A small proportion of these women were in their first trimester and may subsequently have ceased use of these substances. The rates reported here are consistent with other studies (Li et al., 2011; Panaretto et al., 2005; Stewart and Li, 2005; Zubrick et al., 2004). We identified significant concurrent use, such that women currently using any one substance were significantly more likely to also be using others. Many women reported quitting these substances since becoming pregnant, with both a greater number (80%) and a greater proportion (60%) of those using alcohol at the beginning of their pregnancy reporting quitting, than those smoking tobacco (29 women; 20%) or cannabis (25 women; 40%) at the beginning. There was a strong association between quitting one substance and quitting others. Finally, while the majority of women currently used either no substances or only one, those reporting multiple substances were characterised by other risks including low educational achievement, early initiation of substance use and fewer antenatal visits.

Our findings highlight several fundamental issues for policy and clinical practice: clustering of risks among a disadvantaged sub-set of women, and the need to address risks holistically within the social realities of women’s lives; concurrent use of substances and the need to address these substances together; and the importance of prevention and addressing the social determinants of health.

4.1. Clustering of risks and the need to address them holistically

Traditionally policy and service delivery have targeted individual risks such as tobacco, while neglecting consideration of clustering of risks and interactions between risks. This failure to address risk modification holistically limits our ability to address the complexity of risk behaviour within the context of people’s lives and may contribute to disparities in risk behaviour and health outcomes. This is exemplified by the case of antenatal tobacco smoking, where guidelines recommend a 5As approach to advising women to quit smoking, (Fiore et al., 2008; NSW Department of Health, 2006) focusing on the individual woman, with little consideration of other substance use, or the social realities of many disadvantaged women’s lives.

A strong socio-economic gradient in smoking during pregnancy is well documented, (Graham et al., 2010; Mohsin et al., 2011; Page et al., 2012) including among Indigenous Australians (Thrift et al., 2011), and there is evidence that this gradient is related to psycho-social stressors (Graham et al., 2010; Hauge et al., 2012; Pickett et al., 2009). Several studies have demonstrated clustering of psycho-social and behavioural risks among disadvantaged pregnant women (El-Mohandes et al., 2011; Erickson and Arbour, 2012; Page et al., 2012; Pickett et al., 2009). Thus, women who continue to smoke during pregnancy are likely to also experience other risks including other substance use, financial stress, domestic violence and depression, suggesting that a holistic approach to risk modification is required. In our study, women currently using multiple substances had less education and had initiated substance use at earlier ages, than women not currently using any substance. Although we did not measure other socio-economic or psycho-social risks, it is likely that poorly educated women will experience other disadvantages including unemployment, family poverty and housing stress, all of which are more common among Indigenous than non-Indigenous Australians (Australian Institute of Health and Welfare, 2011b). Among Indigenous Australians, stress is repeatedly cited as a major barrier to cessation (Johnston and Thomas, 2008; Lindorff, 2002; Passey et al., 2011), including among pregnant women (Gilligan et al., 2009; Passey et al., 2012; Wood et al., 2008).

Factors contributing to the high prevalence of smoking among Indigenous Australians are similar to those for other disadvantaged groups—in addition to socio-economic disadvantage, poor housing, high unemployment, and associated social problems (Australian Institute of Health and Welfare, 2011b), many people are surrounded by other smokers, increasing cigarette availability, providing frequent smoking cues and ‘normalising’ smoking (Johnston and Thomas, 2008; Lindorff, 2002). For Indigenous Australians, other factors include experiences of racism, a history of grief and loss associated with colonisation and its aftermath, and the importance of smoking in maintaining relationships within community social networks (Johnston and Thomas, 2008; Passey et al., 2011; Wood et al., 2008). Among pregnant Indigenous women, poor knowledge of risks of antenatal smoking, high levels of stress and partner smoking are associated with continued smoking (Gilligan et al., 2009; Passey et al., 2012; Wood et al., 2008). Failure to acknowledge these environmental contributors to antenatal smoking has resulted in programmes focusing on the individual woman, while providing little support to address household or community smoking, nor providing individuals with resources and skills to deal with these problems.

4.2. Concurrent substance use

In our study, the most commonly reported drug was tobacco, with 46% of women currently smoking. Among these women, 50% reported current use of cannabis and/or alcohol, compared to only 13% of women who did not smoke tobacco. Continued tobacco smoking is, therefore, a potentially useful indicator of possible other drug use. Recent Canadian research also identified heavy smoking as a marker for other lifestyle risk factors including substance use (Erickson and Arbour, 2012). Thus, assessment of smoking status helps identify women (tobacco smokers) for whom more careful assessment of alcohol and cannabis use should be undertaken, and who may need additional support to address these and other risks.

4.3. Prevention

Women who were not currently using any substance were better educated, and many had never initiated any substance use, while those who had, had tended to start later. By contrast, those using multiple substances were less educated and had initiated substance use at younger ages. This suggests that preventing uptake of substance use, through measures which focus on the early years is required. Supporting girls to stay in school, and providing opportunities for positive engagement with society through improved educational, sporting and employment prospects is likely to yield considerable benefits.

4.4. Limitations

The results from this study need to be considered in light of its limitations. Due to the small sample size there is adequate power to detect only large differences between groups. Secondly, the study relies on self-report. It is likely that some women under-reported substance use due to social desirability bias and concerns about the consequences of admitting substance use, particularly cannabis, as it is illegal. However, previous studies have confirmed reasonable validity of self-report for tobacco use among pregnant Indigenous Australian women (Gilligan et al., 2010). Nonetheless, some under-reporting is likely. Finally, we did not collect data on many socio-economic or psycho-social factors. Further research to identify characteristics of women most likely to use multiple substances...
4.5. Implications

4.5.1. For research. While there is a substantial body of evidence demonstrating a correlation between socio-economic disadvantage, psycho-social stress, substance use and poor birth outcomes, only a small number of interventions specifically addressing multiple risks among disadvantaged pregnant women have been trialed (Bryce et al., 2009; El-Mohandes et al., 2011), and, to date, this issue has been largely neglected in health policy and practice. It is critical that interventions addressing multiple risks, including tobacco and other substances, be developed and tested in rigorously designed trials. These should be developed specifically for disadvantaged pregnant women, including Indigenous women, and include strategies to address social risks as well as substance use.

4.5.2. For service delivery. Antenatal services providing care for Indigenous women, or other disadvantaged groups, need to be aware of the complexity of tobacco smoking within the context of other psycho-social and behavioural risks, and the realities of women’s lives. In addition to assessing tobacco status, clinicians should explore use of other substances, particularly among tobacco smokers, and support women to quit multiple substances if appropriate. This should happen as early as possible in the pregnancy to maximise benefits to the foetus. It may be possible within the antenatal setting, but may require partnerships with, or referral to, specialised drug and alcohol services. Antenatal providers should also identify other problems women face, and address these themselves or through referral, as these problems may impede women’s ability to address their substance use and may themselves pose a risk. In particular, smoking cessation should not just focus on the individual, but also on the woman’s partner, family and social environment, using a holistic approach consistent with Indigenous models of health and wellbeing (National Aboriginal Health Strategy Working Party, 1989).

4.5.3. Preventing the problem. Greater focus on prevention through addressing the social determinants of poor health is required to reduce the number of women using substances at the beginning of their pregnancies. Community level interventions may also help shift attitudes to tobacco use and increase knowledge of risk (Secker-Walker et al., 2008), thus shifting community norms related to tobacco use, and in the longer term reducing uptake. Current government initiatives to reduce Indigenous smoking through the health promotion roles of the Regional Tackling Smoking Teams (Australian Government Department of Health and Ageing, 2013) may help in this regard.

Role of funding source

The research was funded by grants from the Northern Territory Department of Health and Family, and the Australian Government Department of Health and Ageing. These organisations had no further role in study design, data collection, analysis and interpretation of the data, or the decision to submit the paper for publication.

Contributors

MEP and RSF developed the initial concept for the study. MEP designed the study and data collection tools and coordinated data collection, with advice from RSF and JMS. MEP conducted the data analysis with advice from RSF and CDE. All authors contributed to interpretation and MEP wrote the first draft of the manuscript. All authors contributed to and approved the final manuscript.

Conflicts of interest

Dr Passey receives research grant funding from Pfizer Australia, through an Australian Research Council Linkage Grant and a National Health and Medical Research Council Partnership Grant, for unrelated work. The authors declare no conflicts of interest.

Acknowledgments

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References


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1.3.1 Statements of contribution from co-authors (for Paper Three)
Statement Regarding Candidate Contribution

I, Robert William Sanson-Fisher, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed initial conception, detailed study design, instrument development, study coordination, ethical approvals, data collection, management and analysis, drafting of the paper, submission and response to the reviewers comments, for the paper:


Signature of Co-Author:
Full Name of Co-Author: Robert William Sanson-Fisher
Date: 8/11/13

Signature of Candidate:
Full Name of Candidate: Megan Elizabeth Passey
Date: 12/11/13

Signature of Assistant Dean Research Training (ADRT):
Full Name of ADRT: Robert J. Callister
Date: 2/14/2013
Statement Regarding Candidate Contribution

I, Catherine Anne D’Este, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed initial conception, detailed study design, instrument development, study coordination, ethical approvals, data collection, management and analysis, drafting of the paper, submission and response to the reviewers comments, for the paper:


Signature of Co-Author:
Full Name of Co-Author: Catherine Anne D’Este
Date: 11/11/2013

Signature of Candidate:
Full Name of Candidate: Megan Elizabeth Passey
Date: 12/11/13

Signature of Assistant Dean Research Training (ADRT):
Full Name of ADRT: Robert J. Callister
Date: 21/11/2013
Statement Regarding Candidate Contribution

I, Janelle Marion Stirling, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed initial conception, detailed study design, instrument development, study coordination, ethical approvals, data collection, management and analysis, drafting of the paper, submission and response to the reviewers comments, for the paper:


Signature of Co-Author: 
Full Name of Co-Author: Janelle Marion Stirling 
Date: 7/11/2013

Signature of Candidate: 
Full Name of Candidate: Megan Elizabeth Passey 
Date: 12/11/13

Signature of Assistant Dean Research Training (ADRT): 
Full Name of ADRT: Robert J. Callister 
Date: 11/11/2013
1.4 Published Paper Four
Knowledge, attitudes and other factors associated with assessment of tobacco smoking among pregnant Aboriginal women by health care providers: a cross-sectional survey

Megan E Passey¹*, Catherine A D’Este² and Robert W Sanson-Fisher²

Abstract

Background: As with many Indigenous peoples, smoking rates among Aboriginal Australians are considerably higher than those of the non-Indigenous population. Approximately 50% of Indigenous women smoke during pregnancy, a time when women are more motivated to quit. Antenatal care providers are potentially important change agents for reducing the harms associated with smoking, yet little is known about their knowledge, attitudes or skills, or the factors associated with providing smoking cessation advice.

Methods: This paper aimed to explore the knowledge and attitudes of health care providers caring for pregnant Australian Aboriginal women with regard to smoking risks and cessation; and to identify factors associated with self-reported assessment of smoking. A cross-sectional survey was undertaken with 127 staff providing antenatal care to Aboriginal women from two jurisdictions: the Northern Territory and New South Wales, Australia. Measures included respondents’ estimate of the prevalence of smoking among pregnant women; optimal and actual assessment of smoking status; knowledge of risks associated with antenatal smoking; knowledge of smoking cessation; attitudes to providing cessation advice to pregnant women; and perceived barriers and motivators for cessation for pregnant women.

Results: The median provider estimate of the smoking prevalence was 69% (95%CI: 60,70). The majority of respondents considered assessment of smoking status to be integral to antenatal care and a professional responsibility. Most (79%) indicated that they assess smoking status in 100% of clients. Knowledge of risks was generally good, but knowledge of cessation was poor. Factors independently associated with assessing smoking status among all women were: employer service type (p = 0.025); cessation knowledge score (p = 0.011); and disagreeing with the statement that giving advice is not worth it given the low level of success (p = 0.011).

Conclusions: Addressing knowledge of smoking risks and cessation counselling is a priority and should improve both confidence and ability, and increase the frequency and effectiveness of counselling. The health system must provide supports to providers through appropriate policy and resourcing, to enable them to address this issue.

Background

Reducing smoking among Australia’s Indigenous people has been identified as a government priority in its efforts to “Close the Gap” between Indigenous and non-Indigenous life expectancy [1]. Approximately half the adult Indigenous population smokes, with similar rates for men and women [2]. Identified drivers of smoking among Indigenous Australians include a history of colonisation and dispossession, socio-economic disadvantage and marginalisation, acceptability and normalisation of smoking within Aboriginal social networks and the role of tobacco in social exchange [3-7].

Addressing tobacco smoking during pregnancy could bring significant health gains. Studies with pregnant Australian Indigenous women report smoking prevalence rates between 50% and 67% [8-14], approximately...
three times that in the non-Indigenous population [14]. Smoking during pregnancy is associated with increased risk of maternal and infant adverse outcomes. For the mother, these include higher rates of placental abruption, placenta praevia, premature labour and premature rupture of membranes [15,16]. For the baby, adverse outcomes include low birth weight, preterm birth, intrauterine growth retardation, perinatal death and Sudden Infant Death Syndrome [15,16]. Examination of population-level data confirms these adverse outcomes among Aboriginal women [10].

Pregnancy is considered a “teachable moment”-a time when women are more motivated to modify their behaviour than at other times [17]. Numerous studies in the general population have demonstrated high spontaneous quit rates, with additional women reducing the amount smoked [17-21]. There is also some evidence to support pregnancy as a “teachable moment” among Aboriginal women. A qualitative study with pregnant Aboriginal women from Western Australia found that a few women quit smoking when they became pregnant, but the majority preferred to try to reduce the number of cigarettes smoked as quitting was too difficult and the benefits of smoking outweighed those of quitting [6]. A recent survey of pregnant Aboriginal women in New South Wales (NSW) and the Northern Territory (NT) found that 21% of women smoking at the beginning of their pregnancy reported quitting, while a further 46% reported reducing their smoking [22]. However, smoking during pregnancy among Aboriginal women remains common, perinatal data indicate low quit rates [13], and audits have revealed gaps in provision of advice [23], suggesting that more could be done to capitalise on this opportunity.

Antenatal care providers see pregnant women multiple times throughout their pregnancy, with national data indicating that 77% of Indigenous women attended for at least five antenatal visits [24]. There is strong evidence that provision of smoking cessation counselling in the antenatal period is effective [25]. In other populations, studies have confirmed that women consider provision of smoking cessation support within the antenatal clinic setting to be appropriate [26-28], that information on smoking is best provided by health professionals [29], and that this advice is an important factor in helping women quit smoking [30]. However, the approach and manner of this advice is important [31].

Providers caring for pregnant Aboriginal women are thus potentially important change agents for addressing the harms associated with smoking. Assessment of client smoking is an essential first step in providing tailored cessation advice and support. Exploring the knowledge and views of providers on the value and effectiveness of addressing smoking with pregnant Aboriginal women, and factors associated with provision of care will assist in determining the best approaches to optimising their effectiveness. To date, there have been no studies published on this topic.

**Aims**

This paper explores perceptions of health care providers who provide care to pregnant Aboriginal women regarding:

- Their estimate of the prevalence of smoking among Aboriginal women in their community;
- Optimal and actual assessment of smoking status;
- Their knowledge and attitudes to providing smoking cessation advice; and
- The factors associated with self reported assessment of smoking among pregnant Aboriginal women.

**Methods**

A cross-sectional survey was undertaken with staff providing antenatal care from two jurisdictions: those working in remote medical services in the NT and those providing care through the Aboriginal Maternal and Infant Health Strategy (AMIHS) in NSW. AMIHS teams are comprised of community midwives and Aboriginal Health Workers (AHWs) working together to provide outreach antenatal care for Aboriginal women in multiple sites across NSW. While both professionals work together, the midwives usually focus on the clinical aspects of antenatal care, and the AHWs address health education, community development and social needs. In the NT, staffing of remote clinics varies, with most clinics employing midwives or nurses to provide clinical aspects of antenatal care, and AHWs supporting clinical care and providing health education. Aboriginal Health Workers are a specific category of Australian health professional, working in both government health services and Aboriginal Community Controlled Health Organisations. They are usually members of the local community and work to help bridge the cultural gap between Aboriginal people and the western medical system.

A community reference group (CRG) of Aboriginal women and service providers from rural NSW was formed to guide the study and ensure it was conducted in a culturally secure manner [32]. The CRG provided input into the content and wording of the questionnaire, interpretation of findings and endorsed the reports and papers from the study.

**Recruiting participants**

Staff providing antenatal care to Aboriginal women in each jurisdiction were identified by the relevant health departments. Staff were eligible if they provided antenatal care to Aboriginal women as a part of their normal role. In the NT, the DHF provided a list of staff working
in remote medical services who potentially provided antenatal care (i.e. staff who were not specialists in another field such as mental health). The medical services were then contacted by the research team to establish which staff were actively involved in providing antenatal care and these staff were considered eligible for the survey. In NSW, lists of AMIHS staff were provided by the AMIHS co-ordinator in each Area Health Service. All AMIHS staff were considered eligible for the survey as this is a specific program for provision of antenatal care to Aboriginal families. Eligible staff in both jurisdictions were sent invitation letters, information sheets and self-completion questionnaires. The staff included AHWs, midwives, nurses and doctors. They were asked to complete the anonymous questionnaires and return them in pre-paid envelopes. To maximise response rates and reduce bias, reminder letters, with additional copies of the questionnaire and information sheet, were sent three weeks after the initial invitation and again a month later to all staff. Return of the questionnaire was considered to indicate implied consent. The study was conducted between September 2008 and July 2009.

**Questionnaire development and contents**

**Literature review**

Concepts included in the questionnaire were derived from a review of the published literature on knowledge and attitudes of clinicians to providing advice on smoking to pregnant women [28,29,33-38] and the literature on substance use in pregnancy in general and specifically among Aboriginal peoples [3,6,9,17,26,39]. Specific questions related to knowledge of risks and attitudes towards smoking during pregnancy were adapted from a questionnaire used with pregnant Aboriginal women [40]. Additional questions derived from our research exploring the knowledge and attitudes of pregnant Aboriginal women [22] were also included.

**Consultation with experts**

The draft questionnaire was critically reviewed by several groups with a view to assessing content validity, reducing redundancy and refining the wording of questions to ensure cultural appropriateness. These groups included the CRG, the NT Department of Health and Family, and colleagues of the authors who were experienced in Aboriginal health research, tobacco control and questionnaire design. Minor revisions were made to question order and wording, with removal of some redundant questions and addition of others.

**Pilot testing**

The revised questionnaire was pilot-tested with 12 service providers, including seven midwives and five AHWs, in NSW and Western Australia, who provided additional comments. Further minor modifications were made to the wording of some questions in consultation with the CRG, prior to finalisation of the instrument.

The final questionnaire had a Flesch-Kincaid reading level of grade 9, and took approximately 15 min to complete. The items in the final questionnaire covered:

- Estimated prevalence of smoking among pregnant and non-pregnant women in the local community.
- The perceived percentage of pregnant women that should be assessed for smoking with optimal care, and the percentage actually assessed.
- Knowledge of smoking cessation and of risks associated with smoking during pregnancy.
- Attitudes to providing advice to pregnant women.
- Perceived barriers and motivators to smoking cessation for pregnant women.
- Respondents’ ethnicity, gender, position and their own smoking status (current daily smoker, current occasional smoker, ex-smoker and never-smoker).

Questions related to knowledge and attitudes were presented as statements, and respondents were asked to indicate their agreement on a four-point Likert scale (strongly agree to strongly disagree), with the addition of a ‘not sure’ option for the knowledge questions.

**Statistical methods**

The questionnaires were designed to be computer-scannable. Data were analysed using Stata 9.2. Summary statistics of respondent characteristics were obtained. Due to the non-normal distribution, respondents’ estimates of prevalence of smoking among Aboriginal women are presented as medians with 95% confidence intervals. Responses to the questions about optimal and actual assessment of smoking were dichotomised into ‘100% of women’ or ‘fewer than 100% of women’. These classifications were used as they were considered to be a proxy for whether or not the respondent included assessment of smoking as a core part of routine antenatal care, or as an optional element. Responses to knowledge questions were dichotomised to ‘correct’ or ‘incorrect’, with ‘not sure’ classified as incorrect. The number and percentage correct are presented. Knowledge scores were generated as the sum of the correct responses for knowledge of risk and of cessation separately. Responses to attitude questions were dichotomised to ‘agree’ or ‘disagree’ and the number and percentage of respondents agreeing with the statements presented.

Univariate associations with reported assessment of smoking status were examined using the Fisher’s exact chi-square test for categorical explanatory variables and the non-parametric Mann-Whitney test for continuous explanatory variables. Multivariable logistic regression was used to determine which factors were associated with self reported assessment of smoking status for all clients when adjusted for confounders. Initially all
variables with a p-value < 0.25 in the univariate analyses and cell size ≥ 4 were included in the model, with stepwise removal of variables based on the p-value from the likelihood ratio test, with variables with a p-value < 0.1 retained in the model. Jurisdiction was retained in the model regardless of statistical significance as the differences in social context and service delivery between jurisdictions were considered important. Records with missing data for relevant variables were excluded from the multivariable analysis.

Based on initial information provided by the NT DHF and the NSW AMIHS program we anticipated that there would be 260 eligible service providers across both jurisdictions and with a response rate of 70% there would be 182 respondents. This would allow an estimate of the proportion of providers who assess 100% of women with 95% confidence interval within ± 7% of the point estimate if at least 60% of providers reported assessing 100% of women. It would also allow detection of differences in characteristics between providers who do and those who do not assess smoking status of 100% of pregnant women, of 22% or more with 80% power and 5% significance level.

Ethical approval
The NT survey was approved by the Human Research Ethics Committees of the University of Newcastle and the Northern Territory Department of Human Services and Menzies School of Health Research. The NSW survey was approved by the University of Newcastle, Hunter New England and the Aboriginal Health & Medical Research Council Human Research Ethics Committees.

Results
Respondent characteristics
In total 184 eligible providers were identified of whom 127 (69%) responded to the survey. Of these 33 (26%) were Aboriginal, 30 (24%) were AHWs, 89 (70%) were midwives or nurses and eight were doctors (5%), with the majority (n = 96; 76%) employed in government services and the remainder in Aboriginal Community Controlled Health Services. Nineteen respondents (15%) reported being current smokers with smoking significantly more common among the AHWs (34%) than others (9.4%) (OR = 5.1; 95%CI 1.8, 14.2).

Estimated prevalence of smoking
The median estimate of the prevalence of smoking among pregnant Aboriginal women was 69% (95%CI: 60, 70). The median clinician estimate of the prevalence of smoking among pregnant women was slightly but non-significantly lower than that for non-pregnant women in the community (75%; 95%CI: 70,80).

Optimal and actual assessment of client smoking status
The majority of respondents (n = 103; 86%) indicated that, “with optimal care” they should know the smoking status of all their clients, with 96 (79%) indicating that they “actually ask” the smoking status of all their clients. Those who indicated that, with optimal care, they should know the smoking status of all clients were significantly more likely to claim they asked all clients (p < 0.001). Further univariate analyses revealed that current smokers, AHWs and staff employed by a community-controlled organisation were significantly less likely to report assessing the smoking status of all their clients, relative to non-smokers, other health professionals and those employed by government services respectively (Table 1). There were no differences in self-reported assessment by jurisdiction.

Knowledge of risks associated with smoking during pregnancy and of smoking cessation
Respondents’ knowledge of smoking-related risks was high (see Table 2), although the majority incorrectly indicated that smoking increased the risk of maternal pre-eclampsia. Two respondents did not agree that smoking increased the risk of low birth weight, both of whom reported not always assessing smoking status. There were no other significant differences in knowledge of risks or the total knowledge of risk score between those who did and did not report assessing smoking among all their clients.

The majority of respondents considered that gradual reduction was an effective method of smoking cessation (n = 92 (75%)); while only 61 (50%) thought that stopping suddenly and completely was effective. Correct responses did not differ significantly by reported assessment of smoking status among clients (Table 2). Recognition that nicotine replacement therapy (NRT) could be used in pregnancy was significantly associated with reported assessment as was the total smoking cessation score.

Attitudes to providing advice and perceptions of barriers and enablers to quitting
The majority of respondents agreed with statements that advising women to quit smoking was one of the main things they could do to help women have healthy babies, and that it was a service responsibility to do so, with no difference by assessment status (Table 3). There were also no differences by assessment status in the proportion indicating that helping women quit smoking made them feel proud of their role or that the Aboriginal community saw this as a priority. However, there were significant differences on several other attitudinal variables, with those who don’t assess all women more likely
to agree that advising women to quit smoking was not worth it given the low success rate; that they didn’t have the skills; that other risks faced by women were greater; that they didn’t want to push women away from antenatal care and that smoking was the woman’s choice and not their responsibility. There were no significant differences by assessment status for any of the listed barriers or motivators for quitting (Table 3).

Factors independently associated with assessment of smoking status

Logistic regression identified three variables which were independently and significantly associated with increased odds of self-reported assessment of smoking status, controlling for jurisdiction: working for a government health service; higher smoking cessation knowledge score; and disagreeing with the statement that giving advice is not worth it given the low level of success. Three other variables, although not significant at the 5% level, were significant at the 10% level and also retained in the model: smoking status; and disagreeing with the statements: I’d like to give smoking cessation advice but I don’t have the skills; and I don’t want to push women away from antenatal care by telling them to quit smoking (Table 4).

Table 1 Socio-demographic characteristics of providers by self-reported assessment of tobacco smoking (n = 122)

<table>
<thead>
<tr>
<th>Provider assesses 100% of women (n = 96)</th>
<th>Provider assesses fewer than 100% of women (n = 26)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdiction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>54 (56)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>NT</td>
<td>42 (44)</td>
<td>15 (58)</td>
</tr>
<tr>
<td>Smoking status-current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoker</td>
<td>11 (12)</td>
<td>8 (32)</td>
</tr>
<tr>
<td>Non-smoker</td>
<td>84 (88)</td>
<td>17 (68)</td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AHW</td>
<td>16 (17)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>Midwife/Nurse/Dr</td>
<td>80 (83)</td>
<td>15 (58)</td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community control</td>
<td>16 (17)</td>
<td>11 (42)</td>
</tr>
<tr>
<td>Government</td>
<td>80 (83)</td>
<td>15 (58)</td>
</tr>
</tbody>
</table>

*p missing values on question asking about actual assessment of smoking status
*Fisher’s exact test

Table 2 Knowledge of risks and of smoking cessation, by self-reported assessment of tobacco smoking

<table>
<thead>
<tr>
<th>Knowledge of risk</th>
<th>Correct n (%)</th>
<th>Correct n (%)</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking during pregnancy increases the risk of:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscarriage (losing the baby)</td>
<td>90 (94)</td>
<td>21 (81)</td>
<td>0.055</td>
</tr>
<tr>
<td>Low birth weight of baby</td>
<td>96 (100)</td>
<td>24 (92)</td>
<td>0.044</td>
</tr>
<tr>
<td>Breathing problems and sickness in infant</td>
<td>93 (97)</td>
<td>25 (96)</td>
<td>1.000</td>
</tr>
<tr>
<td>Mother having high blood pressure and increased heart rate (pre-eclampsia)*</td>
<td>3 (3)</td>
<td>1 (4)</td>
<td>1.000</td>
</tr>
<tr>
<td>Behavioural problems in childhood</td>
<td>55 (57)</td>
<td>13 (50)</td>
<td>0.514</td>
</tr>
<tr>
<td>Total knowledge of risk score (median (Q1, Q3))</td>
<td>4 (3, 4)</td>
<td>3.5 (3, 4)</td>
<td>0.247</td>
</tr>
</tbody>
</table>

| Knowledge of cessation                   |               |               |          |
| Nicotine replacement therapy (patches, gum etc) can help women quit | 85 (89)       | 20 (77)       | 0.197    |
| Nicotine replacement therapy shouldn’t be used in pregnancy | 71 (74)       | 11 (42)       | 0.004    |
| An effective way to quit during pregnancy is to just stop altogether, right away | 48 (50)       | 13 (50)       | 1.000    |
| An effective way to quit during pregnancy is to reduce by 1 to 2 cigarettes each day† | 26 (27)       | 4 (15)        | 0.306    |
| Total knowledge of smoking cessation score (median(Q1, Q3)) | 2 (2, 3)     | 2 (1, 2)      | 0.010    |

*Fisher’s exact test, except for knowledge scores which used the non-parametric Mann-Whitney test
*Smoking during pregnancy is not associated with increased risk of pre-eclampsia [16]
†Gradual reduction alone has not been shown to be an effective strategy for smoking cessation in pregnancy [25] and is not recommended in Australian national guidelines on managing smoking in pregnancy [41]
Discussion

In this study we found that better smoking cessation knowledge, a positive attitude towards providing cessation advice and being employed by a government health service were significantly associated with higher rates of self-reported assessment of smoking status while providing antenatal care to pregnant Aboriginal women. There is some indication that being a non-smoker, and disagreeing with statements expressing concern that women would be pushed away from antenatal care or about having inadequate skills were also associated with higher rates of assessment, but these relationships were not statistically significant at the 5% level.

To our knowledge, this is the first study to specifically explore the knowledge and attitudes regarding smoking among service providers caring for pregnant Aboriginal women in Australia. The study was undertaken in two jurisdictions among antenatal care providers in remote, regional and urban Australian settings. The number of eligible providers was less than anticipated and the consequent small sample may have limited our ability to identify other significant associations. However, the response rate was good and the sample is likely to represent this group of service providers reasonably well.

Consistent with studies among other antenatal care providers [28,42,43], the majority of respondents considered that assessing smoking status of all women was integral to good antenatal care and a professional and service responsibility. The majority also indicated that they do ask all women about their smoking. However, over one fifth reported not always asking all women, indicating a missed opportunity for addressing a major preventable risk factor for adverse birth outcomes. While there may be over-estimation of rates of assessment due to social desirability bias, the positive attitudes expressed by the majority of respondents are an asset.

Table 3 Attitudes and perceived barriers and enablers for quitting, by self-reported assessment of tobacco status

<table>
<thead>
<tr>
<th>Attitudes to advising pregnant women to quit smoking</th>
<th>Provider assesses 100% of women (n = 96)</th>
<th>Provider assesses fewer than 100% of women (n = 26)</th>
<th>p-valuea</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is one of the main things that can be done to help women have healthy babies</td>
<td>91 (95)</td>
<td>24 (92)</td>
<td>0.640</td>
</tr>
<tr>
<td>Giving advice about smoking to these women is not worth it given the small level of success</td>
<td>4 (4)</td>
<td>11 (42)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>My health service has a responsibility to encourage pregnant women to quit</td>
<td>94 (98)</td>
<td>24 (96)</td>
<td>0.504</td>
</tr>
<tr>
<td>I’d like to give anti-smoking advice but I don’t have the skills</td>
<td>14 (15)</td>
<td>12 (48)</td>
<td>0.001</td>
</tr>
<tr>
<td>The harms of smoking in pregnancy are minor compared with other risks women face</td>
<td>8 (8)</td>
<td>8 (32)</td>
<td>0.005</td>
</tr>
<tr>
<td>I don’t want to push women away from antenatal care by telling them to quit smoking</td>
<td>17 (18)</td>
<td>13 (52)</td>
<td>0.001</td>
</tr>
<tr>
<td>It’s an individual choice. It’s not up to me to tell a woman to quit smoking</td>
<td>4 (4)</td>
<td>6 (24)</td>
<td>0.005</td>
</tr>
<tr>
<td>Our Aboriginal community sees helping pregnant women quit smoking as a high priority</td>
<td>55 (58)</td>
<td>15 (65)</td>
<td>0.638</td>
</tr>
<tr>
<td>Helping women quit smoking makes me feel proud of my role</td>
<td>78 (82)</td>
<td>18 (82)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Perceived barriers and motivators to smoking cessation

<table>
<thead>
<tr>
<th></th>
<th>Provider assesses 100% of women (n = 96)</th>
<th>Provider assesses fewer than 100% of women (n = 26)</th>
<th>p-valuea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy is a time when most women are more motivated to quit than usual</td>
<td>74 (77)</td>
<td>22 (92)</td>
<td>0.155</td>
</tr>
<tr>
<td>It’s harder to quit during pregnancy than other times</td>
<td>18 (19)</td>
<td>6 (26)</td>
<td>0.403</td>
</tr>
<tr>
<td>There is no point in stopping smoking late in pregnancy</td>
<td>3 (3)</td>
<td>3 (12)</td>
<td>0.102</td>
</tr>
<tr>
<td>Women will try to quit for their children even if they won’t try for themselves</td>
<td>72 (76)</td>
<td>18 (75)</td>
<td>1.000</td>
</tr>
<tr>
<td>Women who smoke cannabis find it harder to quit tobacco</td>
<td>66 (71)</td>
<td>14 (61)</td>
<td>0.450</td>
</tr>
<tr>
<td>Women smoke to bury their pain</td>
<td>59 (63)</td>
<td>14 (56)</td>
<td>0.497</td>
</tr>
<tr>
<td>Women smoke to suppress their emotions</td>
<td>61 (66)</td>
<td>16 (64)</td>
<td>1.000</td>
</tr>
<tr>
<td>Most women who quit in pregnancy, start again when the baby is born</td>
<td>67 (71)</td>
<td>17 (74)</td>
<td>1.000</td>
</tr>
</tbody>
</table>

aFisher’s exact test

N.B up to 6 missing responses for some variables

http://www.biomedcentral.com/1471-2458/12/165
with potential to be enhanced by training and skills development.

In general, knowledge of risks associated with smoking was high, particularly in relation to birth outcomes and infant illness, but not for childhood health problems. An earlier study of Australian directors of antenatal clinics identified poor specific knowledge of risks [33]. Others have reported that providers did not consider smoking a serious risk to infant health [35,44]. The uncertainty regarding risks of ongoing problems in childhood indicates gaps in knowledge and lost opportunities for conveying the true burden of antenatal smoking. As provider knowledge of risk is essential for conveying clear messages regarding risk to women, education of providers regarding the specific risks associated with smoking is essential.

Knowledge of smoking cessation was poor and inversely associated with level of assessment. Only half the respondents recognised that complete and sudden cessation was an effective quitting method; three quarters incorrectly indicated that gradual reduction was effective; and one third incorrectly indicated that NRT shouldn’t be used in pregnancy despite national guidelines stating that NRT can be used in pregnancy [41]. Other studies have also identified a preference among antenatal providers for advising reduction rather than complete cessation [33,36,42,45]. Smoking cessation interventions are poorly covered in nursing curricula [46] and in training for Aboriginal Health Workers [47], which may explain the low level of knowledge and that approximately one fifth felt they didn’t have the skills to provide advice. Perceived skill level is associated with provision of tobacco interventions [37,48], and lack of skills have repeatedly been identified as a barrier to smoking cessation counselling by practitioners [31,49-51]. In our study, both knowledge scores and perceptions of skills were related to level of smoking assessment, suggesting that provision of culturally appropriate, pregnancy-specific training and resources would increase confidence and skills and consequently assessment and management of antenatal smoking.

Although only a small proportion of respondents agreed that giving advice was not worth it, this perception was strongly associated with level of reported assessment, suggesting that pessimism regarding the impact of advice may contribute to non-assessment of smoking status. Pessimism about the effectiveness of interventions has been identified as a barrier to providing cessation counselling in other Australian antenatal settings [37,42,51] and internationally [38,43,44,52,53]. The poor knowledge of smoking cessation identified is likely to contribute to low efficacy of any advice provided, further contributing to a perception that advising cessation is futile. Within the context of providing care to women with multiple complex care needs with constrained resources [5,6,23], providers who anticipate low success rates may prioritise other activities which are easier to implement or have greater chance of success.

### Table 4 Multivariable model of associations with assessing 100% of women for smoking status

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdiction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSW</td>
<td>2.487</td>
<td>0.681, 9.080</td>
<td>0.168</td>
</tr>
<tr>
<td>NT *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current smoker</td>
<td>0.244</td>
<td>0.054, 1.103</td>
<td>0.067</td>
</tr>
<tr>
<td>Current non-smoker *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community controlled</td>
<td>0.183</td>
<td>0.041, 0.811</td>
<td>0.025</td>
</tr>
<tr>
<td>Government *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking cessation knowledge score</td>
<td>1.757</td>
<td>0.985, 3.135</td>
<td>0.011</td>
</tr>
<tr>
<td>Giving advice about smoking to these women is not worth it given the small level of success</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.095</td>
<td>0.015, 0.590</td>
<td>0.011</td>
</tr>
<tr>
<td>Disagree *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I'd like to give anti-smoking advice but I don't have the skills</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.285</td>
<td>0.078, 1.041</td>
<td>0.057</td>
</tr>
<tr>
<td>Disagree *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don't want to push women away from antenatal care by telling them to quit smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>0.330</td>
<td>0.094, 1.159</td>
<td>0.084</td>
</tr>
<tr>
<td>Disagree *</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*reference category
Provider smoking has been shown to be negatively associated with smoking cessation counselling [48,54] and smoking is perceived to be a barrier to providing cessation counselling among Aboriginal Health Workers [6,39,55-57]. Several studies have suggested assisting AHWs to quit in order to increase their comfort in providing cessation support [55,56]. Although only 19 (15%) of the respondents smoked, provision of smoking cessation support to those who do is likely to be beneficial for the individuals, enhance their willingness to provide cessation supports, and give them personal experience in quitting.

One quarter of the respondents indicated concern that providing advice might push women away and this was associated with lower smoking assessment, although this was not significant at the 5% level in the multivariable analysis. In a Western Australian study of smoking during pregnancy, AHWs expressed discomfort about raising smoking as they wished to maintain positive relationships with women [6]. Similar concerns have been identified in other studies with AHWs, although they report feeling more comfortable discussing smoking with pregnant smokers than with other smokers [39,56,57]. In other antenatal settings, a perception that clients are not interested or do not expect advice, has been identified as a barrier [37,52], and midwives have expressed concern about potentially damaging their relationship with women if they address their smoking [28,31,50]. By contrast, women consider provision of smoking cessation advice within antenatal care to be acceptable [26], and state that it doesn’t affect their relationships with their midwives [27]. However, the manner of providing care is important, and should not be authoritarian [28,50,54,58,59]. Greater community and provider understanding of the real risks of smoking and benefits of cessation may increase community support and help providers feel more comfortable addressing smoking.

Limitations to this research should be considered in interpreting the findings. In addition to the small sample size and potential social desirability bias mentioned above, the cross-sectional nature of the survey prevents assessment of causality in the relationship between assessment and the knowledge and attitudinal variables. Factors other than the knowledge and attitudinal variables included in our study may be determining respondents smoking cessation activities, and the reported attitudes may then reflect a rationalisation on the part of respondents to justify their behaviour. Trials of interventions that aim to address knowledge and attitudes would be beneficial in assessing this. A further limitation is that the study did not assess the amount or type of advice that the clinicians provide to women.

Conclusions
This study has identified factors constraining the provision of evidence-based antenatal care in relation to tobacco use, but has also found strengths on which to build. The majority of providers recognised that smoking increased the risk of adverse outcomes, considered that giving cessation advice was important, and believed that providing advice was their responsibility. The majority reported assessing all women for smoking and saw it as part of optimal antenatal care.

The poor knowledge of providers regarding smoking cessation reinforces the call from others for development of culturally appropriate training and resources for providers caring for Aboriginal peoples [5,47,55,60], including those specific to pregnancy [6,61]. Addressing knowledge of risks and smoking cessation counselling among antenatal providers is a priority and should improve both confidence and ability, and increase the frequency and effectiveness of counselling. Programs designed to support pregnant women to quit smoking need to address the many drivers of smoking, including high levels of stress and disadvantage, and social norms of smoking [4-7]. Additionally, the health system must provide supports to providers through appropriate policy and resourcing, to enable them to address this issue. Recent government initiatives in Indigenous smoking are likely to raise recognition of the importance of addressing smoking at every opportunity and should be accompanied by broader efforts to address Indigenous disadvantage.

Abbreviations
AHW: Aboriginal health worker; AMIHS: Aboriginal maternal and infant health strategy; CRG: Community reference group; NSW: New South Wales; NT: Northern territory.

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Authors’ contributions
MP and RSF conceived of the study and developed the study design, data collection instruments and procedures. MP collected the data. Statistical analysis was carried out by MP, CDE and RSF. All authors participated in data interpretation. MP led manuscript preparation. All authors revised the manuscript critically and approved the final version.

Competing interests
The authors declare that they have no competing interests.


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1.4.1 Statements of contribution from co-authors (for Paper Four)
Statement Regarding Candidate Contribution

I. Robert William Sanson-Fisher, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed detailed study design, instrument development, study coordination, ethical approvals, data collection, management and analysis, drafting of the paper, submission and response to the reviewers comments, for the paper:


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1.5 Published Paper Six
Supporting Pregnant Aboriginal and Torres Strait Islander Women to Quit Smoking: Views of Antenatal Care Providers and Pregnant Indigenous Women

Megan E. Passey · Rob W. Sanson-Fisher · Janelle M. Stirling

Abstract To assess support for 12 potential smoking cessation strategies among pregnant Australian Indigenous women and their antenatal care providers. Cross-sectional surveys of staff and women in antenatal services providing care for Indigenous women in the Northern Territory and New South Wales, Australia. Respondents were asked to indicate the extent to which each of a list of possible strategies would be helpful in supporting pregnant Indigenous women to quit smoking. Current smokers (n = 121) were less positive about the potential effectiveness of most of the 12 strategies than the providers (n = 127). For example, family support was considered helpful by 64 % of smokers and 91 % of providers; between 56 and 62 % of smokers considered advice and support from midwives, doctors or Aboriginal Health Workers likely to be helpful, compared to 85–90 % of providers. Rewards for quitting were considered helpful by 63 % of smokers and 56 % of providers, with smokers rating them more highly and providers rating them lower, than most other strategies. Quitline was least popular for both. This study is the first to explore views of pregnant Australian Indigenous women and their antenatal care providers on strategies to support smoking cessation. It has identified strategies which are acceptable to both providers and Indigenous women, and therefore have potential for implementation in routine care. Further research to explore their feasibility in real world settings, uptake by pregnant women and actual impact on smoking outcomes is urgently needed given the high prevalence of smoking among pregnant Indigenous women.

Keywords Tobacco smoking · Smoking cessation · Indigenous · Consumer preference

Introduction

Tobacco smoking among pregnant Aboriginal and Torres Strait Islander women remains three times as common as among non-Indigenous Australian pregnant women, with approximately 50 % of women smoking during pregnancy [1]. Addressing this disparity is a priority for reducing the gap in health outcomes between Indigenous and non-Indigenous Australians. Disparities in smoking rates between Indigenous and non-Indigenous pregnant women are also marked in the United States, Canada and New Zealand [2–4]. While interventions to reduce antenatal smoking are known to be effective in non-Indigenous populations [5], to date effective interventions for pregnant Indigenous women have not been identified [6–8].

Previous reviews of interventions for smoking cessation in Indigenous peoples have concluded that approaches that specifically target Indigenous populations can be successful [9, 10], and that interventions targeting individuals, such as counselling and nicotine replacement therapy (NRT), which are known to be effective in other populations, are likely to be effective for Indigenous people [11]. However, these reviews did not include trials with pregnant Indigenous women. A review of smoking cessation interventions specifically for pregnant Indigenous women identified only two relevant trials, neither of which increased cessation, highlighting the need for further research to identify effective strategies [8]. In addition to considering approaches found to work in other pregnant population groups, a useful starting point for developing interventions is an
exploration of the views of pregnant Indigenous women, and the staff providing their antenatal care.

Aims

To assess support for a range of potential smoking cessation program strategies among pregnant Indigenous women who currently smoke tobacco, pregnant ex-smokers, and their antenatal care providers.

Methods

Cross-sectional surveys with antenatal care providers and pregnant Indigenous women were undertaken in the Northern Territory (NT) and New South Wales (NSW). The project was guided by a community reference group (CRG) to ensure cultural security. The CRG was composed of Aboriginal women from the community (some of whom were pregnant), Aboriginal Health Workers (AHWs) and Community Midwives. Ethical approval for the research was provided by the Human Research Ethics Committees of the University of Newcastle, the NT Department of Human Services and Menzies School of Health Research, Hunter New England Health Service and the Aboriginal Health & Medical Research Council of NSW.

Recruitment

The detailed methodology for both surveys is described elsewhere [12, 13]. A brief summary follows.

Staff Survey

Briefly, staff providing antenatal care in remote medical services in the NT and through the Aboriginal Maternal and Infant Health Service (AMIHS) in NSW were eligible and were identified by their relevant health departments and services. All staff worked in community based services. Between September 2008 and July 2009, eligible staff were sent invitation letters, information sheets and self-completion questionnaires. They were asked to complete the anonymous questionnaires and return them in pre-paid envelopes. Reminder letters with additional copies of the documents were sent twice—3 weeks after the initial invitation and again 1 month later. Return of the questionnaire was considered to imply consent.

Women’s Survey

Women were recruited by the AMIHS teams from July to December 2009, and from the maternity outpatient clinic of a major hospital from July to September 2010 and April to June 2011. Women were eligible if pregnant and if they or their partner were Indigenous. They were excluded if aged less than 16; being treated for mental illness; or unable to provide informed consent. Consecutive eligible women were invited to participate by the midwife, AHW or a female Aboriginal research assistant, who explained the study and provided women with information sheets. Written consent was obtained. Recruiting staff offered assistance to complete the questionnaire if required. Staff were asked to invite all eligible women to participate and to complete a recruitment log to track participation rates.

Statistical Analysis

Responses to the question on smoking status were categorised into current smokers (current daily or occasional smokers), ex-smokers or never smokers. Responses to the questions on the helpfulness of the strategies were dichotomised into ‘very or somewhat helpful’ or ‘other’.
For the women’s survey, only responses from smokers and ex-smokers were included in the analysis.

Summary statistics of respondent characteristics were obtained. For the women, mean age and number of cigarettes smoked were calculated. Years of school, and parity were categorised, and the number and percentage in each category reported. For the staff, the number and percentage for each profession was calculated.

The proportion of each group (women who were current smokers, ex-smokers and service providers) who considered each strategy ‘very or somewhat helpful’ was calculated and 95 % confidence intervals generated. We also assessed the proportions in each group indicating that each strategy ‘maybe helpful’, was ‘not helpful’ or was ‘harmful’.

Results

Description of the Sample

In total, 264 women responded to the survey, of whom 121 were current smokers and 55 were ex-smokers and included in this analysis. The response rate could not be calculated as not all teams returned recruitment logs, but among the teams which did, the response rate was 88 %. The majority of smokers (85, 70 %) reported smoking every day with the remaining 36 (30 %) smoking occasionally. The smokers reported an average of 10 cigarettes per day. Other characteristics of the current smokers and ex-smokers are presented in Table 1.

127 of 184 (69 %) eligible service providers responded, of whom 30 (24 %) were AHWs, 89 (70 %) were nurses or midwives, and eight (5 %) were doctors. Nineteen (15 %) reported being current smokers [10 AHWs (33 %) and nine midwives (10 %)].

Perceived Helpfulness of Suggested Strategies

The numbers of participants indicating that they thought each strategy would be very or somewhat helpful for pregnant women in quitting smoking are shown in Table 2 and are presented in order of the proportion of current smokers indicating they thought the strategy would be helpful. Overall, a greater proportion of service providers were likely to consider each of the strategies helpful than the current smokers, with the ex-smokers generally between the providers and the current smokers. Four of the six strategies rated most highly by smokers (family support, advice and support from the midwife, doctor or AHW) were also in the top five supported strategies for ex-smokers and the top four for providers. Interestingly, rewards were the most popular strategy among ex-smokers (83 %) and the 2nd most popular with current smokers (63 %) but equal 10th among providers (56 %). Community activities were less supported by ex-smokers (51 %) than by either current smokers (59 %) or providers (74 %). Access to Quitline was supported by less than 50 % of respondents in all three groups. For each strategy, respondents who did not consider it likely to be helpful were split fairly evenly between ‘maybe helpful’ and ‘not helpful’. The only strategies considered harmful by more than one person in any group were free NRT which was considered harmful by eight providers, five current smokers and one ex-smoker; and rewards for quitting which were considered harmful by six providers, one current smoker and one ex-smoker (not shown in table).

Discussion

This paper is the first we are aware of that explores the degree to which pregnant Indigenous women and antenatal care providers consider particular strategies helpful for antenatal smoking cessation. In general, current smokers were least supportive of most strategies, and providers were most supportive. The majority of strategies were supported by over half the participants in each group. The reasons for the lower support among current smokers than among ex-smokers and providers on most strategies is not known, but may reflect their personal struggles with quitting and recognition of the difficulty of quitting or a general sense of hopelessness regarding the prospects of success. While these results reflect the opinions of respondents, not the actual efficacy of strategies, establishing acceptability is a useful starting point for developing intervention trials.

Rewards for Smoking Cessation

A similar proportion of current smokers and providers considered rewards likely to be helpful (63.3 and 55.6 % respectively) but a higher proportion of ex-smokers indicated they thought rewards would be helpful (83 %), with rewards the most popular strategy in this group, 2nd most
The Cochrane review of antenatal smoking cessation interventions identified provision of incentives, or rewards, as the most effective intervention, with incentives reducing smoking by 24% compared to 6% for all interventions combined [5]. Incentives are considered most effective for simple, time-limited behaviours such as completing immunisation, but may be less effective where the required behaviour change is complex [14]. For maintaining complex behaviour change, financial incentives may be a useful addition to multi-faceted programs that address the complex individual, social and economic factors affecting behaviour [14].

Incentives for antenatal smoking cessation are already used in some parts of the British NHS [15, 16], yet their use for health behaviour change remains controversial [15]. In a survey of pregnant Australian women, the majority did not support paying pregnant smokers to quit, but smokers were more likely to do so [17]. A qualitative study with social service staff and clients found that clients were supportive of rewards for quitting while staff were less so, and expressed concerns about the feasibility of implementation [18]. Our results add to this body of work identifying significantly greater support for rewards among ex-smokers than among providers. Given the apparent efficacy of incentives in antenatal smoking cessation, further research is required to explore the reasons for the low support among providers relative to their support for other strategies.

### Involving Family

The strategy rated highest by both current smokers and providers was “support for the whole family to help others quit”. Smokers who are supported by their partners are more likely to succeed, but a recent systematic review of interventions aimed at enhancing partner support to improve smoking cessation found little evidence for effective interventions [19]. Family based interventions have been recommended for Indigenous Australians because of the importance of family in influencing smoking behaviour [20, 21]. The endorsement by women and service providers in our study provides additional evidence for their acceptability and further support for their inclusion in future trials to assess their efficacy.

### Health Professionals

Advice and support from the range of health professionals were each rated reasonably highly by all groups. Good evidence exists for efficacy of advice from doctors and nurses [22, 23], however midwives, including midwives caring for Indigenous women, have expressed reluctance to address smoking, concerned that they may damage their relationship with their clients [12, 24]. Similar concerns
have been expressed by AHWs, with the additional concern that AHW smoking may impede providing advice [25]. However, over half the women in our study indicated that support from each of the health professionals was likely to be helpful, suggesting this approach is acceptable, perceived to be effective and may be a fruitful approach.

Other Strategies

Community activities were rated fifth and sixth by current smokers and providers respectively but 10th by ex-smokers. The reasons for the lower support among ex-smokers are not known. Previous studies have emphasised the preference of Indigenous Australians for programs to be community-based [21]. Although community interventions increase knowledge of risks, change attitudes to smoking and increase quit attempts, they have not been shown to reduce the prevalence of smoking [26, 27].

Other activities considered helpful by at least half of each group included free NRT, support groups and brochures. NRT is efficacious in non-pregnant populations, but evidence for its effectiveness in pregnancy is inconclusive [28]. Pregnant Indigenous women have previously been found to have relatively low levels of nicotine dependency [29], which may contribute to the lower rating for NRT in our study. Current guidelines state that NRT should be considered if a pregnant woman is otherwise unable to quit [30], and it would therefore be reasonable to include free NRT as a component of future cessation trials. In non-pregnant populations, group programs are more effective than self-help and other low intensity interventions, but the limited research in this area has not provided an adequate evidence base to determine whether they are more effective than intensive individual counselling, or whether they provide additional benefit as an adjunct to individual support [31]. Although generally supported by respondents in each group, the logistic challenges of running groups, particularly in rural areas, would need to be overcome if they were to be included in future smoking cessation trials. Low intensity interventions, including providing verbal or written advice, demonstrated a small benefit in the Cochrane review on antenatal smoking cessation [5]. While unlikely to have a large impact, culturally appropriate brochures and other resources may be a useful prop to use when discussing smoking cessation.

Interestingly, less than half the current smokers thought that stress management programs would be helpful. Research on smoking among Indigenous Australians has emphasised stress as an impediment to cessation [21, 32]. Although stress contributes to pregnant women failing to quit, and stress management techniques are included in some cessation programs, the evidence on their benefit is inconclusive [33].

Limitations

A number of limitations need to be considered in interpreting the results from this study. The response rate was higher among the women than the service providers. The reasons for this difference are unknown, but it may be due to differences in recruitment, with providers recruited by letter, and women recruited through a personal approach. Secondly, the sample is fairly small, despite the reasonably good response rates. However, Indigenous women are a small proportion of the population, and engaging them in research can be challenging. One of the strengths of this study is that it includes women from across two different states, and they are representative of pregnant Indigenous women nationally with regard to age and parity [34]. Thirdly, a delay between the providers’ and the women’s surveys may have impacted on the results. However, we are unaware of any specific programs or initiatives which occurred between the two surveys that could be considered to impact on the findings. A fourth limitation is that the data are drawn from cross-sectional surveys, with no opportunity to explain the proposed strategies in more detail, nor to explore the reasons for support or opposition to the strategies. More importantly, the apparent support may not translate into implementation or uptake, nor into actual changes in smoking behaviour. Further intervention research is required to explore the feasibility of implementing these strategies in real world settings, their uptake by pregnant women and their actual impact on smoking rates and health outcomes.

Conclusions

Exploring the views of stakeholders involved in antenatal smoking cessation—the providers and the pregnant women, has identified the strategies which are most acceptable, and thus the ones most likely to be implemented if introduced in routine care. These strategies, if known to be effective in other pregnant populations, should be included in interventions and tested in trials to assess their real world uptake and their impact on smoking behaviours and health outcomes. Given the apparent efficacy of rewards in other population groups, further research is required to assess their efficacy among pregnant Indigenous women and to identify reasons for their lower support by providers.

Acknowledgments This research was funded by grants from the Northern Territory Department of Health and Family, and the Australian Government Department of Health and Ageing. We are extremely grateful to the members of the Community Reference Group for their enthusiastic support and advice to this project. We wish to thank the staff who helped recruit women, and both the staff and women who kindly gave their time to completing our survey.
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References


1.5.1 Statements of contribution from co-authors (for Paper Six)
Statement Regarding Candidate Contribution

I, Robert William Sanson-Fisher, attest that Research Higher Degree candidate Megan Elizabeth Passey, contributed initial conception, detailed study design, instrument development, study coordination, ethical approvals, data collection, management and analysis, drafting of the paper, submission and response to the reviewers comments, for the paper:


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Date: 21/11/2013
Statement Regarding Candidate Contribution

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Date: 21/11/2013
1.6 Published Paper 7
How will we close the gap in smoking rates for pregnant Indigenous women?

Antenatal smoking is the most important modifiable cause of adverse pregnancy outcomes. Indigenous Australian women are more than three times more likely to smoke during pregnancy than non-Indigenous women. As a result, adverse outcomes are more frequent in Indigenous than non-Indigenous babies, with smoking as an independent risk factor.

Reviews of antenatal smoking interventions have shown effective cessation strategies for pregnant women. However, persistently high rates of smoking during pregnancy among Indigenous women suggest that current interventions have had limited impact. Finding ways to effectively reduce smoking in pregnant Indigenous populations is a high priority. Previous systematic reviews have examined smoking cessation interventions for Indigenous peoples; however, none has specifically investigated smoking cessation among pregnant Indigenous women.

We undertook a systematic review to examine the effectiveness and methodological quality of smoking cessation interventions targeting pregnant Indigenous women. In December 2012 we searched MEDLINE, PsycINFO, CINAHL (Cumulative Index to Nursing and Allied Health Literature) and Cochrane databases with appropriate search terms, and checked reference lists of retrieved articles. Papers were included if they reported a smoking cessation intervention aimed at pregnant Indigenous women, included a control group and provided cessation results specifically for pregnant Indigenous women. Only peer-reviewed, English-language papers were included. We extracted data and assessed methodological quality against Effective Practice and Organisation of Care quality criteria.

Of 59 identified papers only two met eligibility criteria: one from the United States with Alaskan Native women, and one from Australia with Aboriginal and Torres Strait Islander women. Both involved culturally tailored interventions specifically developed for the target group, and used face-to-face counselling, structured follow-up, attempts to involve family members and nicotine replacement therapy (NRT). Both studies found no treatment effect and had a number of limitations (Box). This lack of evidence of effective smoking cessation interventions for pregnant Indigenous women prevents implementation of evidence-based programs and highlights a critical need for methodologically rigorous testing of possible strategies.

What interventions should we test?

Evidence from research with Indigenous populations, and with pregnant women generally, provides guidance about the strategies that hold promise for pregnant Indigenous women. These strategies are outlined as follows.

Summary

• Aboriginal and Torres Strait Islander women are more than three times more likely to smoke during pregnancy than non-Indigenous women, greatly increasing the risk of poor birth outcomes.

• Our systematic review found that there is currently no evidence for interventions that are effective in supporting pregnant Aboriginal and Torres Strait Islander women to quit smoking, which impedes development and implementation of evidence-informed policy and practice.

• There is an urgent need for methodologically rigorous studies to test innovative approaches to addressing this problem.

Tailor interventions to local culture

Interventions for Indigenous people need to be culturally secure and locally tailored in order to increase acceptability and accessibility. Involving local people in developing and tailoring intervention resources to the local context is critical for improving cultural appropriateness, building ownership and enhancing a sense of autonomy, all of which are important in successful cessation.

Include routine assessment and support

Smoking cessation guidelines for pregnant women recommend a systematic approach to cessation where every woman is asked about her smoking status, with smokers followed up and supported to quit in a respectful manner. Health professionals may be reluctant to repeatedly assess smoking status due to concerns that it may be deleterious to their relationship with women and the women’s engagement with care. However, most Indigenous women expect antenatal care to include smoking cessation advice. Systems to support routine assessment and support should be included in intervention trials.

Provide relevant information

Indigenous women’s knowledge of specific risks of smoking while pregnant is often vague. Providing information on the harms of smoking and benefits of cessation may motivate some women to attempt to quit. Discussing the woman’s role as a mother and a role model for her family may be more motivating for some Indigenous women than health risk narratives and should be addressed in intervention trials.

Deliver cessation support through all antenatal providers

Overall, 78% of Indigenous women attend five or more antenatal visits during their pregnancies. Providing cessation support through routine antenatal care

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overcomes barriers to attending separate services. A collaborative approach between midwives, Aboriginal Health Workers (AHWs) and doctors, all providing consistent advice and support, will reinforce the importance of cessation. The credibility of medical practitioners may be a significant motivating factor for some women. In cases where midwives provide much of the care, the close relationship and frequent contact allows ongoing support. AHWs' cultural knowledge and strong links with local families will enhance implementation of cessation support. In a survey of Indigenous women, over 70% of women felt that support from these professionals was likely to be helpful.

**Involve other members of the community**

The high prevalence of smoking in Indigenous communities has resulted in smoking being “normalised” as a socially acceptable behaviour, with frequent triggers to smoke and cigarettes being readily available. Smoking is important in social relationships, and cessation can lead to feelings of isolation. Supportive environments for quitting have aided cessation among Indigenous ex-smokers. Trialling interventions that incorporate mechanisms to provide a supportive, pro-cessation environment, such as involving household members in supporting women, peer support groups and whole community interventions should be further explored.

**Address relapse**

Interventions that incorporate strategies to prevent smoking relapse result in fewer women relapsing in late pregnancy. Up to 80% of women who quit during pregnancy relapse within 1 year. Specific relapse prevention support should be provided during pregnancy and postpartum, including information about the effects of environmental tobacco smoke on the baby, support to make a smoke-free home and support for household members to quit smoking. Relapse prevention strategies have not been examined among Indigenous women and should be included in future trials.

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### Quality rating of eligible studies reporting smoking cessation interventions aimed at pregnant Indigenous women, according to Effective Practice and Organisation of Care quality criteria

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<thead>
<tr>
<th>Criteria</th>
<th>Patten et al</th>
<th>Eades et al</th>
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<tbody>
<tr>
<td>Design</td>
<td>Clinical controlled trial</td>
<td>Randomised controlled trial</td>
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<tr>
<td>Allocation sequence adequately generated?</td>
<td>Unclear</td>
<td>Low risk</td>
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<tr>
<td>Concealment of allocation?</td>
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<td>Low risk</td>
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<tr>
<td>Baseline outcome measurements similar?</td>
<td>Low risk</td>
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<tr>
<td>Baseline characteristics similar?</td>
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<td>Low risk</td>
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<tr>
<td>Incomplete outcome data adequately addressed?</td>
<td>Unclear</td>
<td>Low risk</td>
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<tr>
<td>Knowledge of allocated interventions prevented?</td>
<td>Unclear</td>
<td>Low risk</td>
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<tr>
<td>Protection against contamination?</td>
<td>High risk</td>
<td>High risk</td>
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<tr>
<td>Selective outcome reporting?</td>
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<td>Free from other risk of bias?</td>
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<td>Low risk</td>
</tr>
<tr>
<td>Comments</td>
<td>The low consent rate and the fact that many women did not take part because they were not ready to quit increases the chances of selection bias. The focus of the study was on feasibility and acceptability rather than on outcomes, although outcomes are reported.</td>
<td>High loss to follow-up (33%), but this did not differ between the groups. Randomisation was by week of first visit, so the staff who were recruiting the women were aware of the group allocation. This may have contributed to the greater numbers recruited to the intervention group.</td>
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### Use contingency-based financial rewards

Systematic reviews of antenatal smoking cessation interventions have found that financial rewards contingent on successful smoking abstinence are significantly more effective than other interventions. However, their efficacy with Indigenous women has not been tested. Australian surveys indicate that contingency-based rewards are considered likely to be helpful by over 90% of Indigenous women and 83% of their antenatal providers. This approach should be further explored with Indigenous women.

### Other substances

Surveys of pregnant Indigenous women found that tobacco smokers were more than three times more likely than non-smokers to report cannabis or alcohol use, both of which are risk factors for continued smoking. Given the known negative impact of these substances on birth outcomes and the interaction between their use and use of tobacco, interventions should include explicit assessment of other substance use, with support to address these if required.

### Training providers

A lack of protocols and poor smoking cessation support skills have been identified as barriers to providing cessation support to pregnant Indigenous women. Well defined protocols detailing specific procedures, and the role of each provider, may assist in increasing provision of support in routine care. Training should cover skills in smoking cessation support, supportive communication and using protocols, as well as recording women’s smoking status, cessation behaviour and support provided, to facilitate consistent advice from all team members.

### Possible challenges

Conducting complex behavioural intervention trials is difficult. Potential challenges include:
Random allocation
As smoking cessation support is provided at both the service and individual level, randomisation at the individual level is inappropriate as contamination between groups is likely. Cluster randomised controlled trials with randomisation of dispersed services may reduce this problem but require larger sample sizes and more participating services, increasing costs and logistics challenges. As services and communities may not be willing to be randomly allocated to “usual care”, it may be more appropriate to undertake a head-to-head comparison of two approaches considered likely to be effective.19

Adherence to protocols
Poor adherence to intervention protocols may occur as a result of unsuitable intervention requirements, inadequate staff training, high staff turnover and lack of systems to support the intervention. Smoking among AFHs has also been identified as a potential barrier to implementation and would need to be addressed as part of the intervention.14,16 Strong organisational support for the implementation and evaluation of protocols is critical to supporting adherence. Collaborative development of the intervention and study design with Indigenous services and pilot studies to assess acceptability and feasibility of the research will help successful implementation.

Conclusions
Given the importance of finding effective strategies to decrease smoking among pregnant Indigenous women, and the current lack of evidence to guide this process, there is an urgent need for rigorous studies to test innovative approaches. While there are many challenges in this research, these may be managed with existing evidence. Provenance:

1.6.1 Statements of contribution from co-authors (for Paper Seven)
Statement Regarding Candidate Contribution

I, Robert William Sanson-Fisher, attest that Research Higher Degree candidate Megan Elizabeth Passey contributed conceptualisation of the topic and approach to the review, literature searches, data extraction, drafting of the paper, submission and response to the reviewers comments, for the paper:


Signature of Co-Author:
Full Name of Co-Author: Robert William Sanson-Fisher
Date: 8/11/13

Signature of Candidate:
Full Name of Candidate: Megan Elizabeth Passey
Date: 12/11/13

Signature of Assistant Dean Research Training (ADRT):
Full Name of ADRT: Robert J. Callister
Date: 21/11/2013
Statement Regarding Candidate Contribution

I, Jamie Bryant, attest that Research Higher Degree candidate Megan Elizabeth Passey contributed conceptualisation of the topic and approach to the review, literature searches, data extraction, drafting of the paper, submission and response to the reviewers comments, for the paper entitled "How will we close the gap in smoking rates for pregnant Indigenous women?" published in the Medical Journal of Australia, 2013, 199(1): 39-41.

Signature of Co-Author: 
Full Name of Co-Author: Jamie Bryant 
Date: 20.8.2015

Signature of Candidate:
Full Name of Candidate: Megan Elizabeth Passey
Date: 12/11/13

Signature of Assistant Dean Research Training (ADRT):
Full Name of ADRT: Robert J. Callister
Date: 21.11.2013
Statement Regarding Candidate Contribution

I, Alix E Hall, attest that Research Higher Degree candidate Megan Elizabeth Passey contributed conceptualisation of the topic and approach to the review, literature searches, data extraction, drafting of the paper, submission and response to the reviewers comments, for the paper entitled “How will we close the gap in smoking rates for pregnant Indigenous women?” published in the Medical Journal of Australia, 2013; 199(1): 39-41.

Signature of Co-Author:
Full Name of Co-Author: Alix Edna Hall
Date: 21/08/2013

Signature of Candidate:
Full Name of Candidate: Megan Elizabeth Passey
Date: 12/11/13

Signature of Assistant Dean Research Training (ADRT):
Full Name of ADRT: Robert J Callister
Date: 21/11/2013
Appendix 2
2.1 Reports produced in relation to this thesis


2.2 Presentations related to this thesis

Invited presentations


“It’s almost expected”: Smoking initiation and maintenance by Aboriginal women in rural NSW. NSW Tobacco Control Forum – Evidence, Achievements and Future Directions, NSW Cancer Institute, Sydney, NSW. November 2009.


Supporting pregnant Aboriginal and Torres Strait Islander women to quit smoking. Australian Smoking Cessation Conference. Sydney, NSW. November 2013.

Conference presentations selected from abstract


Appendix 3
3.1 Letter of support from Bundjalung Elders
Dear Megan

At the Elders Executive meeting it was passed to give support to your program/study of smoking by pregnant Aboriginal women.

Yours In Unity

Bertha Kapeen

19-7-07
3.2 Ethics approvals for qualitative study
3.2.1 Ethics approvals for qualitative study from the North Coast Area Health Service, NSW Health
26 July 2007

Dr Megan Passey
Senior Lecturer
Primary Health Research
Northern Rivers University Department of Rural Health
PO Box 3074
Lismore, NSW 2480

Dear Dr Passey

RE: NCAHS HREC NO. 409N
Understanding smoking and smoking cessation by pregnant Aboriginal women

Thank you for your email of 25 July 2007 to the North Coast Area Health Service (NCAHS) Human Research Ethics Committee (HREC) attaching copy of signed support for the above study by the Bundjalung Elders.

The Chair, Paul Corben, reviewed your correspondence on 26 July 2007 and resolved to approve the study.

Documents approved for this study include:

- Ethics application
- Appendix A: Invitation
- Appendix B: Focus Group Information Sheet
- Appendix C: Focus Group Consent Form
- Appendix D: Women’s Information Sheet
- Appendix E: Consent to Participate Form
- Appendix F: Focus Group Interview Guide
- Appendix G: Questionnaire
- Bundjalung Elders Council Aboriginal Corporation letter of support
The NCAHS HREC is constituted and operates in accordance with the National Health and Medical Research Council’s National Statement on Ethical Conduct in Research Involving Humans (National Statement).

Final approval to commence the Understanding smoking and smoking cessation by pregnant Aboriginal women study has now been granted.

As part of this approval, the following must be provided to the NCAHS HREC:

Amendments and Reporting of Serious Adverse Events
Researchers should immediately report anything to the Research Ethics Committee which might warrant review of ethical approval of the protocol, including:

- Serious or unexpected adverse effects on local participants (reports to be de-identified);
- Proposed changes in the protocol or any other material given to the participants in the study must be known prior to being actioned, including patient information and consent forms; and
- Unforeseen events that might affect continued ethical acceptability of the project.

Study Progress Reports
At least annually, reports from principal researchers should be submitted to the Research Ethics Committee on matters including:

- Progress to date or outcome in the case of completed research;
- Maintenance and security of records;
- Compliance with the approved protocol;
- Compliance with any conditions of approval;
- If the research project is discontinued before the expect date of completion.

Investigators have a responsibility to provide updated Investigator Brochures to the HREC.

It is requested that updated Patient Information Consent Forms that are approved by the HREC, to be forwarded to all patients on the Trial.

Please quote 409N, short and full study name in all correspondence and ensure all documentation relating to this study is forwarded, with original and required number of copies being double-sided and 2-hole punched, to:

Human Research Ethics Committee
North Coast Area Health Service
PO Box 126
PORT MACQUARIE NSW 2444
On behalf of the NCAHS HREC I wish you all the best with your research.

If you wish to discuss any matters further, please contact me on 02 6588 2941.

Yours sincerely

Val Johnstone
Research Ethics Officer

*Human Research Ethics Committee*
3.2.2 Ethics approvals for qualitative study from the University of Newcastle
To Chief Investigator or Project Supervisor:  
Professor Rob Sanson-Fisher

Re Project Title:  
Understanding smoking and smoking cessation by pregnant Aboriginal women

Date:  
16 August 2007

Approval No:  
H-555-0807

Thank you for your response in support of your application to the Human Research Ethics Committee (HREC) seeking approval for the above project, which is the student research of Dr Megan Passey.

Your response has been considered by the Chair or Deputy Chair of the HREC under the provisions for expedited review and I am pleased to advise that your application has been approved effective 16 August 2007.

The full Committee will be asked to ratify this decision at its meeting on 19 September 2007 whereupon a formal Certificate of Approval will be issued. In the interim your approval number is H-555-0807 and you may proceed.

Best wishes for a successful project.

Ms Ruth Gibbins  
Human Research Ethics Officer (Acting)

Research Services  
Research Office  
T +61 2 492 16333  
F +61 2 492 17164  
Ruth.Gibbins@newcastle.edu.au
3.3 Information sheets
3.3.1 Information sheet for provider focus group
Service Provider Focus Group Information Sheet for Project

Understanding smoking by pregnant Aboriginal women

We are running a study to find out what would help pregnant Aboriginal women quit smoking. We are inviting you to join a focus group with other members of the Community Reference Group. The study is being conducted by Dr Megan Passey and Jenny Gale at the Northern Rivers University Department of Rural Health here in Lismore. Prof. Rob Sanson-Fisher from the University of Newcastle is also involved.

**Why is the study being done?**

The purpose of the study is to get a better understanding of why pregnant Aboriginal women smoke, what the issues are and ways to help them quit smoking so we can develop a program to help them quit.

**Who can join in?**

We are inviting service providers from the studies Community Reference Group to join in. We are running separate focus groups for community women.

**What choice do you have?**

Being part of the focus group is your choice. If you don’t want to join in that is entirely up to you and won’t affect your role in the Community Reference Group, or your relationship with the University. Also, you don’t have to answer any questions you feel uncomfortable with – it’s all up to you. We will only include people who want to come along and who sign a consent form.

**What will it involve?**

We would like you to join a focus group to discuss smoking. A focus group is a form of group interview to get people’s views. The other participants will all be local service providers from the Community Reference Group. We are interested in your views about what women do and what they think about smoking. We will ask the group about the things that influence women to smoke or not, if they are interested in quitting, and what would help them quit. The discussion will also cover use of alcohol and yarndi/cannabis as this has been raised by Ngayundi Health Council and can influence people’s smoking. **It doesn’t matter if you are a smoker or not; we would love to hear your ideas.** We plan to use the results to develop a quitting program that really meets women’s needs.

The focus group will take about 2 – 2½ hours, and will be held in Lismore. If you agree to take part, we will contact you to let you know when and where it will be held. The focus group will be run by Megan and Jenny. The discussion will be tape-recorded, and later we will type it all up on computer. We will give you a typed copy of the discussion for you to check afterwards. If you think we have recorded your comments wrongly, you will have the chance to change them.
What are the risks and benefits of participating?

There will be no immediate benefits for participants. However, the information will be used to develop a program to help pregnant women quit smoking. So it may influence your services in the future. There are no risks associated with joining in.

How will your privacy be protected?

The information you give us will be kept strictly confidential and your privacy respected. All participants will be asked to keep the discussions confidential and not talk to other people about what was said. No one will be personally identified and information will not be passed on to any other people.

How will the information be used?

The discussion will be tape-recorded. Afterwards we will type it all up on computer. We will give you a typed copy of the discussion for you to check. If you think we have recorded your comments wrongly, you will have the chance to correct them.

Once we have finished collecting all the information we will summarise it and discuss it with the project’s Community Reference Group. We will also present it to the Bundjalung Elders Council. After that we will write a report for NSW Health and North Coast Area Health Service. We will use the information to develop a program to help women quit smoking. We will report the results at conferences and write them up for health journals. We will also give you a summary of the findings if you would like one.

We will not identify anyone individually in any of these reports.

What will happen to the information after we have written all the reports?

Once we have finished writing the reports and presenting the results at conferences, the information will be stored safely for seven years. We will keep the original tapes and the computer files at the University. Only the research team will have access to these. After seven years, all the information will be destroyed.

What do you need to do to participate?

If you want to join in just let us know - call Megan or Jenny on 6620 7570, or email Megan on Megan.Passey@ncahs.health.nsw.gov.au.

If you would like to contact us with any questions or comments, please don’t hesitate – just give us a call, or send an email.
Contact details of the study team
Megan Passey or Jenny Gale
Northern Rivers University Department of Rural Health
School of Medicine & Public Health
61 Uralba St
Lismore, NSW 2480
Tel: 6620 7570
Email: megan.passey@ncahs.health.nsw.gov.au

Professor Rob Sanson-Fisher
University of Newcastle
Newcastle, NSW 2300
Tel: 4923 6169
Rob.Sanson-Fisher@newcastle.edu.au

Complaints about the study
If you have any concerns or complaints about the study, you can report them to the NCAHS Ethics Committee, by contacting the Research Ethics Officer, North Coast Area Health Service Human Research Ethics Committee, PO Box 126, Port Macquarie, NSW 2444 or Tel: (02) 6588 2941, Fax: (02) 6588 2942 or Email: EthicsNCAHS@ncahs.health.nsw.gov.au

Thank you for considering this invitation.

Megan Passey
3.3.2 Information sheet for women’s interviews
Women’s Information Sheet for Project
Understanding smoking by pregnant Aboriginal women

We are running a study to find out what would help pregnant Aboriginal women quit smoking. We are inviting you to participate in an interview to find out what your views are. The study is being conducted by Dr Megan Passey and Jenny Gale at the Northern Rivers University Department of Rural Health here in Lismore. Prof. Rob Sanson-Fisher from the University of Newcastle is also involved.

Why is the study being done?
The purpose of the study is to get a better understanding of why pregnant Aboriginal women smoke, what the issues are and ways to help them quit smoking so we can develop a program to help them quit.

Who can join in?
We are inviting pregnant Aboriginal women, or women who’ve had a baby in the last year, and who live in Lismore, Goonellabah, Ballina or Cabbage Tree Island to participate.

What choice do you have?
Participation in an interview is entirely your choice. If you don’t want to join in, that is entirely up to you and won’t affect the care you get from the health service or your relationship with the University. Also, you don’t have to answer any questions you feel uncomfortable with – it’s all up to you. We will only include people who want to come along and who sign a consent form.

What will it involve?
If you agree to participate, we will arrange a time and place for you to have the interview. We are interested in your views about what women do and what they think about smoking. We will ask you about the things that influence women to smoke or not, if they are interested in quitting, and what would help them quit. The discussion will also cover use of alcohol and yarndi/cannabis as this has been raised by Ngayundi Health Council and can influence people’s smoking. It doesn’t matter if you are a smoker or not; we would love to hear your ideas. We plan to use the results to develop a quitting program that really meets women’s needs.

The interview will take about 1 – 1½ hours, and will be held in a place that suits you. If you agree to take part, we will contact you to arrange it with you. You will be interviewed by an Aboriginal woman. At the end of the interview, we will also ask you to complete a brief questionnaire that covers the same topics. The interview will be tape-recorded, and later we will type it all up on the computer. We will give you a typed copy of the interview for you to check afterwards. If you think we have recorded your comments wrongly, you will have the chance to change them.
What are the risks and benefits of participating?
There will be no immediate benefits for participants. However, the information will be used to develop a program to help pregnant women quit smoking. So if you are a smoker and become pregnant again, it is possible that you will benefit from this program. There are no risks associated with joining in.

How will your privacy be protected?
The information you give us will be kept strictly confidential and your privacy respected. No one will be personally identified and your information will not be passed on to any other people.

How will the information be used?
The discussion will be tape-recorded. Afterwards we will type it all up on computer. We will give you a typed copy of the discussion for you to check. If you think we have recorded your comments wrongly, you will have the chance to correct them.

Once we have finished collecting all the information from all the interviews we will summarise it and discuss the results with the project’s Community Reference Group. We will also present it to the Bundjalung Elders Council. After that we will write a report for NSW Health and North Coast Area Health Service. We will use the information to develop a program to help women quit smoking. We will also report the results at conferences and write them up for health journals. We will also give you a summary of the findings if you would like one.

We will not identify anyone individually in any of these reports.

What will happen to the information after we have written all the reports?
Once we have finished writing the reports and presenting the results at conferences, the information will be stored safely for seven years. We will keep the original tapes and the computer files at the University. Only the research team will have access to these. After seven years, all the information will be destroyed.

What do you need to do to participate?
You can just let the Aboriginal Health Worker or midwife who gave you this information sheet know that you are interested. She will pass on your contact details to us. If you would rather, you can contact us directly. Just call 6620 7570 and ask for Jenny or Megan.

If you would like to contact us with any questions or comments, please don’t hesitate – just give us a call, or send an email.
Contact details of the study team
Megan Passey or Jenny Gale
Northern Rivers University Department of Rural Health
61 Uralba St
Lismore, NSW 2480
Tel: 6620 7570
Email: megan.passey@ncahs.health.nsw.gov.au

Professor Rob Sanson-Fisher
School of Medicine and Public Health
University of Newcastle
Newcastle, NSW 2300
Tel: 4923 6169
Email: Rob.Sanson-Fisher@newcastle.edu.au

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Thank you for considering this invitation.

Megan Passey
3.3.3 Information sheet for women's focus group
Community Focus Group Information Sheet for Project

Understanding smoking by pregnant Aboriginal women

We are running a study to find out what would help pregnant Aboriginal women quit smoking. We are inviting you to join a focus group with other women. The study is being conducted by Dr Megan Passey and Jenny Gale at the Northern Rivers University Department of Rural Health here in Lismore. Prof. Rob Sanson-Fisher from the University of Newcastle is also involved.

Why is the study being done?
The purpose of the study is to get a better understanding of why pregnant Aboriginal women smoke, what the issues are and ways to help them quit smoking so we can develop a program to help them quit.

Who can join in?
We are inviting Aboriginal women from Lismore, Goonellabah, Ballina and Cabbage Tree Island to join in. Aboriginal health workers are talking to women using services in these areas and inviting them to come along.

What choice do you have?
Being part of the focus group is your choice. If you don’t want to join in, that is entirely up to you and won’t affect the care you get from the health service, or your relationship with the University in any way. Also, you don’t have to answer any questions you feel uncomfortable with – it’s all up to you. We will only include people who want to come along and who sign a consent form.

What will it involve?
We would like you to join a focus group to discuss smoking. A focus group is a form of group interview to get people’s views. The other participants will all be Aboriginal women from this area. We are interested in your views about what women do and what they think about smoking. We will ask the group about the things that influence women to smoke or not, if they are interested in quitting, and what would help them quit. The discussion will also cover use of alcohol and yarndi/cannabis as this has been raised by Ngayundi Health Council and can influence people’s smoking. It doesn’t matter if you are a smoker or not; we would love to hear your ideas. We plan to use the results to develop a quitting program that really meets women’s needs.

The focus group will take about 2 – 2½ hours, and will be held in Ballina. You will be paid $45 to cover any travel expenses or other costs you have. If you agree to take part, we will contact you to let you know when and where it will be held. The focus group will be run by Megan and Jenny. The discussion will be tape-recorded, and later we will type it all up on computer. We will give you a typed copy of the discussion for you to check afterwards. If you think we have recorded your comments wrongly, you will have the chance to change them.
What are the risks and benefits of participating?
There will be no immediate benefits for participants. However, the information will be used to develop a program to help pregnant women quit smoking. So if you are a smoker and become pregnant again, it is possible that you will benefit from this program. There are no risks associated with joining in.

How will your privacy be protected?
The information you give us will be kept strictly confidential and your privacy respected. All participants will be asked to keep the discussions confidential and not talk to other people about what was said. No one will be personally identified and information will not be passed on to any other people.

How will the information be used?
The discussion will be tape-recorded. Afterwards we will type it all up on computer. We will give you a typed copy of the discussion for you to check. If you think we have recorded your comments wrongly, you will have the chance to correct them. Once we have finished collecting all the information we will summarise it and discuss it with the project’s community reference group. We will also present it to the Bundjalung Elders Council. After that we will write a report for NSW Health and North Coast Area Health Service. We will use the information to develop a program to help women quit smoking. We will also report the results at conferences and write them up for health journals. We will also give you a summary of the findings if you would like one.

We will not identify anyone individually in any of these reports.

What will happen to the information after we have written all the reports?
Once we have finished writing the reports and presenting the results at conferences, the information will be stored safely for seven years. We will keep the original tapes and the computer files at the University. Only the research team will have access to these. After seven years, all the information will be destroyed.

What do you need to do to participate?
You can just let the Aboriginal Health Worker who gave you this information sheet know that you are interested. She will pass on your contact details to us. If you would rather, you can contact us directly. Just call 6620 7570 and ask for Jenny or Megan.

If you would like to contact us with any questions or comments, please don’t hesitate – just give us a call, or contact us at the address below.

Contact details of the study team
Megan Passey or Jenny Gale
Northern Rivers University Department of Rural Health
61 Uralba St
Lismore, NSW 2480
Tel: 6620 7570
Email: megan.passey@ncahs.health.nsw.gov.au

Professor Rob Sanson-Fisher
School of Medicine and Public Health
University of Newcastle
Newcastle, NSW 2300
Tel: 4923 6169
Email: Rob.Sanson-Fisher@newcastle.edu.au
Complaints about the study
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Thank you for considering this invitation.

Megan Passey
3.4 Consent forms
3.4.1 Women’s consent form
Women’s Consent Form

Understanding smoking by pregnant Aboriginal women

Principal Researchers: Dr Megan Passey, Prof Rob Sanson-Fisher

1. I agree to take part in the study described in the Information Sheet and give my consent freely.
2. I have read and understood the Information Sheet which explains the purpose of the study and what will be required of me. I have been given a copy of the Information Sheet to keep.
3. I consent to:
   • being interviewed about smoking and issues related to smoking, by a member of the research team. This will take 1 – 1½ hours and will be tape-recorded. I will have the opportunity to review a typed copy of the interview and make changes if I like. □ Yes □ No
   • completing a brief questionnaire. □ Yes □ No
4. I have been given the opportunity to ask any questions I have about the study. I have received satisfactory answers to any questions that I have asked.
5. I understand that my participation is voluntary and that I am free to withdraw at any time without affecting my relationship with the health service or the university.
6. I understand that my personal information will remain confidential to the researchers.
7. I agree that the information gathered from the results of the study may be published, and recognise that there will be no identifying information included in any publications.
8. I understand that if I have any questions related to the study I may contact Dr Megan Passey at the Northern Rivers University Department of Rural Health on 6620 7516, or by email on megan.passey@nrahs.nsw.gov.au

Print name: _________________________________________________________
Address: __________________________________________________________
Phone number: _______________
Signature: _________________________ Date: ______________

Complaints about the study

If you have any concerns or complaints about the study, you can report them to the NCAHS Ethics Committee, by contacting the Research Ethics Officer, North Coast Area Health Service Human Research Ethics Committee, PO Box 126, Port Macquarie, NSW 2444 or Tel: (02) 6588 2941, Fax: (02) 6588 2942 or Email: EthicsNCAHS@ncahs.health.nsw.gov.au
3.4.2 Consent form for women under 18 years of age
Additional Consent Form for Women under 18 Years of Age

To be completed by the parent, guardian or responsible adult with whom the woman is living

Understanding smoking by pregnant Aboriginal women

Principal Researchers: Dr Megan Passey, Prof Rob Sanson-Fisher

1. I agree for the young woman named on the other side of this form to take part in the study described in the Information Sheet and I give my consent freely.

2. I have read and understood the Information Sheet which explains the purpose of the study and what will be required of her. I have been given a copy of the Information Sheet to keep.

3. I consent to the young woman:
   • being interviewed about smoking and issues related to smoking, by a member of the research team. This will take 1 – 1½ hours and will be tape recorded. She will have the opportunity to review a typed copy of the interview and make changes if she likes  ☐ Yes  ☐ No
   • completing a brief questionnaire.  ☐ Yes  ☐ No

4. I have been given the opportunity to ask any questions I have about the study. I have received satisfactory answers to any questions that I have asked.

5. I understand that her participation is voluntary and that she is free to withdraw at any time without affecting her or my relationship with the health service or the university.

6. I understand that her personal information will remain confidential to the researchers.

7. I agree that the information gathered from the results of the study may be published, and recognise that there will be no identifying information included in any publications.

8. I understand that if I have any questions related to the study I may contact Dr Megan Passey at the Northern Rivers University Department of Rural Health on 6620 7516, or by email on megan.passey@ncahs.health.nsw.gov.au

9. I am the:  ☐ Parent or legal guardian of the young woman named
              ☐ A responsible adult with whom she is currently living

Print name: __________________________________________________________

Address: __________________________________________________________

Phone number: ______________

Signature: _____________________________  Date: ______________________
3.4.3 Consent form for focus group
Focus Group Consent Form

Understanding smoking by pregnant Aboriginal women

Principal Researchers: Dr Megan Passey, Prof Rob Sanson-Fisher

1. I agree to take part in the study described in the Information Sheet and give my consent freely.
2. I have read and understood the Information Sheet which explains the purpose of the study and what will be required of me. I have been given a copy of the Information Sheet to keep.
3. I consent to participating in a focus group which will take about 2 – 2½ hours and will be tape-recorded. I will have the opportunity to review a typed copy of the interview and make changes if I like.
4. I have been given the opportunity to ask any questions I have about the study. I have received satisfactory answers to any questions that I have asked.
5. I understand that my participation is voluntary and that I am free to withdraw at any time without affecting my relationship with the health service or the university.
6. I understand that my personal information will remain confidential to the researchers.
7. I agree that the information gathered from the results of the study may be published, and recognise that there will be no identifying information included in any publications.
8. I understand that if I have any questions related to the study I may contact Dr Megan Passey at the Northern Rivers University Department of Rural Health on 6620 7516, or by email on megan.passey@ncahs.health.nsw.gov.au

Print name: __________________________________________________________
Address: __________________________________________________________
Phone number: ______________
Signature: ___________________________ Date: _______________________

Complaints about the study
If you have any concerns or complaints about the study, you can report them to the NCAHS Ethics Committee, by contacting the Research Ethics Officer, North Coast Area Health Service Human Research Ethics Committee, PO Box 126, Port Macquarie, NSW 2444 or Tel: (02) 6588 2941, Fax: (02) 6588 2942 or Email: EthicsNCAHS@ncahs.health.nsw.gov.au
3.5 Focus group and interview topic guide
Understanding smoking and smoking cessation
by pregnant Aboriginal women

Focus Group and Interview Guide

(May be adapted further for individual interviews with women)
(N.B. These provide a guide to the topics to cover, not the specific wording)

Introduction
Welcome and introductions (for focus group)
Thank them for participating

General explanation of the purpose of the study and the Focus Group or Interview
Explain the process and that they will all receive a transcript for comment
Confidentiality issues – won’t use any names or other identifying information in any reports.
Don’t have to answer any questions they don’t want to
Can withdraw/leave at any time
Focus Group rules of confidentiality and respect:
• Respect each other’s opinions, even if they differ from your own
• Treat all the discussions and others opinions with confidentiality – not to be discussed outside this room.
Answer any questions or concerns of participant(s)
Ensure all have signed consent form

General perceptions of smoking
How do people use tobacco in Aboriginal communities? What about women and girls?
Why do (Aboriginal) people smoke?
Are there any specific cultural reasons why Aboriginal people around here smoke?
What are some of the positive things about smoking (What do people get out of it)?
What about women and girls?
What about the negative things?
Is it generally considered OK to smoke among Aboriginal people? Does this differ for different age groups or male/female?

How common is smoking among Aboriginal people? Is this different for different groups, e.g. men/women, young people/older people, town/community, etc? Why?

When and where do people smoke?

Do people smoke by themselves, or only with others?

Starting smoking

What do you think makes people start smoking?

What about young girls/women – influences on starting smoking?

About what age do girls usually start smoking?

Why?

Rest of discussion related to women/girls only – ask about women/girls generally, and then pregnant women/girls in particular

Type/how/source

What sort of tobacco do women/girls use? Why?

(prompts – tailor-made, roll your own, pipes, cigars, chewing tobacco, other)

Where do they get it from? (prompts – buy their own, from friends/family, availability in communities, etc)

Do they usually buy by the packet or individual smokes?

What about kids – how do they get it?

Frequency/dependency

How much/often do women/girls smoke?

(looking for discussion of social smokers vs regular dependent smokers, etc)

What if they don’t have any smokes (or money)?

(looking for indicators of level of dependency – go without or find some somewhere; sharing/social exchange)
Perceptions of harm

Do people talk about tobacco smoking?
What do they say?
Do people worry about the health effects of smoking?
Do you think women/girls are aware of the risks? What about risks for pregnant women?
If so, why do they still smoke (despite knowing the risks)?
What about the costs of smoking? Do people worry about the price of tobacco?
What about other effects of smoking?
What about passive smoking? Do you think people are aware of the dangers of passive smoking?
What do they do about passive smoking? Why?
(prompts – not smoking in house, car; smoking downwind, etc)

Other drugs and impact on smoking

What about yarndi/cannabis/marijuana? Do women/girls around here smoke yarndi?
Why do you think they smoke it?
How do they smoke it? What kind(s)?
Mixing with tobacco or smoking consecutively?
When, where and who with?
How often do women/girls smoke it?
Does it affect their tobacco use? Why and how?
What if they don’t have any?
What age do girls usually start?
Does it affect their ability to quit smoking tobacco?

What about alcohol? Do women/girls drink alcohol?
Why do they drink?
What kind(s)?
When, where and who with?
How often do women/girls drink?
Does it affect their tobacco use? Why and how?
What age do girls usually start?
Does it affect their ability to quit smoking tobacco?

What about other drugs? Do women/girls here use other drugs?
Which ones?
When, where and who with?
How often do women/girls use other drugs?
Does it affect their tobacco use? Why and how?
What age do girls usually start?
Does it affect their ability to quit smoking tobacco?

Influence of others
Do you think that other people influence women/girls in their smoking (or not smoking)?
Who, how, what kind of influence, why?
(community norms, role models, peers, partner, household members, etc)
What about other people helping someone to quit? Does this happen? Who and how?
Are there other ideas you have for how this could be increased?

Quitting (explore in relation to quitting/reducing tobacco, cannabis and alcohol, both during pregnancy and generally)
What about quitting smoking? What do you think are common attitudes to quitting among women/girls? Why?
What are the benefits of quitting? What are the downsides?
Do you think many people want to quit?
Do you think many do quit? Why do they? How do they do it?
Why do you think it is so hard for women/girls to give up smoking?
What would help women/girls quit? Why?
What wouldn’t help?
What things make it hard for women/girls to quit? Why?
What about NRT (explain)? What kinds of NRT do you know about? What do you think about that as an option to help people? (prompts – cost, availability, perception of efficacy and risks). Why?

Do people use NRT? Why or why not?

How effective do you think it is? Are there any problems with it?

Is it acceptable to suggest to someone that they should quit? If so, who can say that?

Are you aware of any tobacco control services or programs that work for Aboriginal people? Pregnant women?

What would you like to see in terms of programs for the community and particularly for pregnant women?

What do you think would work?

What is the best role for the different health staff in relation to helping people quit (doctors, midwives, AHEO, others)?

Who would clients take advice from?

What modes of information and support might help – brochures, posters, mass media, face-to-face counselling, advice from family or friends, role models (community leaders, peer leaders, sports stars, etc)

What about linking quitting to traditional values?

Additional questions for women

What do you know about the health effects of smoking?

What are the risks during pregnancy?

Have you ever tried to quit?
3.6 Women’s questionnaire
Understanding smoking and smoking cessation

by pregnant Aboriginal women

Questionnaire for Women

Please remember, all the information here is treated with complete confidentiality and your privacy is respected. We do NOT collect your name or other identifying information on this questionnaire and information will not be passed on to any other people. If there are any questions that you do not wish to answer, that is OK. Just leave those ones blank. However, we hope you will feel comfortable answering these questions fully and frankly, as the information will help us in designing future programs for pregnant Aboriginal women.

About you

1. How old are you? ________ years

2. Do you identify as: (please circle the most appropriate one)
   an Aboriginal person .............................................. 1
   a Torres Strait Islander ......................................... 2
   Both ......................................................................... 3
   Non-Indigenous Australian ................................. 4
   Other ......................................................................... 5

   (If you are Aboriginal) Are you Bundjalung? □ Yes □ No

3. Where do you usually live?
   Ballina .................................................................... 1
   Cabbage Tree Island .............................................. 2
   Goonellabah .......................................................... 3
   Lismore ................................................................. 4
   Other ......................................................................... 5
4. Are you pregnant at the moment? □ Yes □ No

If no:
Have you been pregnant in the last 6 months? □ Yes □ No

5. How many children have you given birth to? _______

6. How many adults usually live in the house you live in? _______


8. What is the highest level of education you have completed?

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school</td>
<td>1</td>
</tr>
<tr>
<td>Secondary school</td>
<td>2</td>
</tr>
<tr>
<td>Last year completed</td>
<td></td>
</tr>
<tr>
<td>Technical/trade certificate</td>
<td>3</td>
</tr>
<tr>
<td>Diploma/advanced diploma</td>
<td>4</td>
</tr>
<tr>
<td>University degree</td>
<td>5</td>
</tr>
</tbody>
</table>

9. What is your main source of income?

<table>
<thead>
<tr>
<th>Source of Income</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time employment</td>
<td>1</td>
</tr>
<tr>
<td>Part-time employment</td>
<td>2</td>
</tr>
<tr>
<td>Temporary benefit (e.g. unemployment)</td>
<td>3</td>
</tr>
<tr>
<td>Pension (e.g. aged, disability)</td>
<td>4</td>
</tr>
<tr>
<td>Student allowance (Abstudy/Austudy)</td>
<td>5</td>
</tr>
<tr>
<td>CDEP</td>
<td>6</td>
</tr>
<tr>
<td>Dependent on others</td>
<td>7</td>
</tr>
<tr>
<td>No income</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
</tr>
</tbody>
</table>

Tobacco smoking

10. At the moment are you a:

<table>
<thead>
<tr>
<th>Status</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>1</td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>2</td>
</tr>
</tbody>
</table>
| Never smoked                     | 3    | (Go to question 18)
| Not sure                        | 4    |

11. Before you got pregnant were you a:

<table>
<thead>
<tr>
<th>Status</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoker</td>
<td>1</td>
</tr>
<tr>
<td>Ex-smoker</td>
<td>2</td>
</tr>
<tr>
<td>Not sure</td>
<td>3</td>
</tr>
</tbody>
</table>
12. What types of tobacco do you smoke, or did you smoke? (please mark all types you have ever smoked)
   Tailor-made cigarettes ........................................... □
   Roll your own ........................................................... □
   Pipes/cigars ............................................................. □
   Other ........................................................................... □ Please specify

13. What types of tobacco do you smoke and how much do you smoke each day? Please complete the table below for the amount you smoke now and the amount you smoked before you were pregnant.

<table>
<thead>
<tr>
<th>Type of tobacco</th>
<th>Number/amount per day NOW</th>
<th>Number/amount per day BEFORE YOU WERE PREGNANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailor-made cigarettes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll your own</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipes/cigars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. How old were you when you had your first cigarette? ________ years

15. How old were you when you started smoking tobacco regularly? ________ years

16. Have you ever tried to quit smoking tobacco? □ Yes □ No
   If yes, what is the longest period you have quit for? ________________________
   Did you try to quit during your pregnancy? □ Yes □ No
   Comments: _________________________________________________________________
                                                                                     _________________________________________________________________

17. Which one of these describes you best?
   I’m trying to quit using tobacco (e.g. cutting down, getting patches or other help) ......................................................................................... 1
   I’m thinking about quitting .............................................................................. 2
   I am not thinking about quitting ........................................................................ 3
Alcohol and yarndi/cannabis

18. Do you drink alcohol at the moment? □ Yes □ No
19. Did you drink alcohol before you got pregnant? □ Yes □ No
20. Do you smoke yarndi/cannabis at the moment? □ Yes □ No
21. Did you smoke yarndi/cannabis before you got pregnant? □ Yes □ No

Other people you live with

For these next 3 questions, do not include yourself in the answers.

22. How many of the people who usually live in your house smoke tobacco? ______
23. How many of the people who usually live in your house drink alcohol? ______
24. How many of the people who usually live in your house smoke yarndi? ______

Smoking in the house or car

25. Do people mostly smoke outside or inside at home?
   - Outside ...................................................................................... 1
   - Inside .......................................................................................... 2
   - Not sure ....................................................................................... 3

26. Do people usually smoke in the car?
   - Yes, regardless of other people in the car ........................................... 1
   - Yes, but not if there are non-smokers in the car ................................. 2
   - Yes, but not if there are children in the car ....................................... 3
   - Sometimes – some people do and some don’t ................................. 4
   - No, never ....................................................................................... 5

Thanks for answering all of these questions.
It’s been really valuable getting your input.
Appendix 4
4.1 Support letters from Aboriginal Medical Services
30th April 08

Megan Passey,
Snr Lecturer Primary Health Care Research
Northern Rivers University
Department of Rural Health
School of Public Health
University of Sydney
PO Box 3074
Lismore, NSW 2480

Dear Megan

RE: research study in Bourke titled “Northern Rivers — Supporting Young Mums to Quit Smoking Research Program”

On behalf of the Bourke aboriginal Health Service, I am please to inform you that the Directors approved your research project titled “Support Young Mums to Quit” to be conducted within the Bourke community under the condition that;

The following clauses are added to your research application stating:

1. The Bourke Aboriginal community has the ownership of the Bourke data and information collected during the research project.
2. The Bourke Aboriginal Community is able to use the information and data to support projects to benefit their community.
3. The research project in Bourke to be conducted through the Bourke Aboriginal Health Service.

We feel we are in a unique position to engage the local community therefore offer you our support in conducting this research project.

In approving the project, the directors acknowledge that the research would be extremely beneficial to our young mums within our communities, additionally the project will support
our Aboriginal Health Workers by enhancing our “Quit Smoking” initiatives implemented within our communities. This project would additionally skill our health staff to evaluate their programs.

We look forward to working with you and your fellow researchers, from the Northern Rivers University, on this very worthwhile project.

Yours in Health

Judy Johnson
Chief Executive Officer
Dr Megan Passey  
Senior Lecturer  
Northern Rivers University Department of Rural Health  
PO Box 3074  
Lismore NSW 2480  

Dear Dr Passey,

Thank you for your letter regarding smoking in pregnancy research. Winnunga Nimmityjah Aboriginal Health Service is able to participate in the second stage survey. We already know that smoking rate is high in our pregnant clients and we are very keen to identify evidence-based interventions which could reduce this rate. We are supportive of good quality research which can provide evidence in this regard.

If you wish to further discuss Winnunga’s participation in this project please contact Dr Ana Herceg on 02 6284 6222 or Ana.Herceg@winnunga.org.au.

Yours sincerely,

Ms Julie Tongs  
Chief Executive Officer  
May 2008
8th April 2008

Dr Megan Passey
Northern Rivers UDRH
PO Box 3074
Lismore NSW 2480

Re: Research Project – Supporting Mums to Quit

Dear Dr Passey

I am writing on behalf of the Galambila Aboriginal Health Service Inc in regard to the research project “Supporting Mums to Quit” that you wish to undertake. The Galambila Aboriginal Health Service supports this research project being undertaken in the communities served by our health service. We consider smoking in pregnancy to be a priority area for our service to address.

Yours Sincerely

Dave Kennedy
CEO
Galambila Aboriginal Health Service Inc
Dr Megan Passey  
Senior Lecturer Primary Health Care Research  
Northern Rivers University Department of Rural Health  
School of Public Health  
University of Sydney  
PO Box 3074  
LISMORE NSW 2480

Dear Megan

Letter of Support – Smoking in Pregnancy

First of all, I would like to take this opportunity to apologise for taking so long to provide this letter of support for your program.

The Griffith AMS fully supports any project that works toward ensuring healthier babies and higher birth weights. Your program is aimed at addressing the issue of smoking during pregnancy, which is a major issue amongst young mothers within our community.

The Griffith AMS looks forward to working with you on this project and would be more than pleased to expand upon this if required to do so.

Yours sincerely

[Signature]
Stacey Meredith  
Chief Executive Officer  
23.06.08
Friday 20 June 08

Dr Megan Passey
Senior Lecturer Primary Health Care Research
Northern Rivers University Department of Rural Health
School of Public Health
University of Sydney
PO Box 3074
LISMORE NSW 2480

Dear Dr Passey

Re: Research Project on Smoking in Pregnancy for Aboriginal Women

I refer to our discussion yesterday regarding the above and thank you for your call and follow up.

Katungul Aboriginal Corporation Community and Medical Services agree to be involved in this research project on the basis that the Aboriginal Health and Medical Research Council of NSW Ethics Committee approve this research project ethics application.

We also provide this letter as a confirmation of our support.

Yours sincerely

Damien Matcham
Chief Executive Officer

Cc
Ms Sandra Bailey
Chief Executive Officer
AH&MR
PO Box 1565
STRAWBERRY HILLS NSW 2032
28 May 2008

Megan Passey
NRUADRH, University of Sydney
61 Uralba Stree
LISMORE NSW 2480

Dear Megan,

Re: Research – Supporting Mums to Quit

I am writing, to confirm that Riverina Medical and Dental Aboriginal Corporation supports the second stage of this research, that is, the conduct of a survey in our area of NSW, as detailed in your correspondence of 7 March 2008.

We look forward to receiving feedback on the outcomes.

Yours faithfully,

Maree Keogh
Acting Chief Executive Officer
13th May, 2008

Dr M Passey  
Researcher,  
NRUDRH,  
University of Sydney,  
61 Uralba Street  
Lismore, NSW 2480.

Dear Dr Massey,

I refer to your communication of 8th April, 2008 relating to research supporting mothers to quit smoking. We support this initiative and will assist as best we can in the research process that you are proposing. I would ask that you liaise with Deb Nichols our Maternity Health Nurse for assistance.

Yours Sincerely

Ray Matthews  
Chief Executive Officer
Thursday, 17 April 2008

Dr Megan Passey
NRU DRH University of Sydney
61 Uralba St
Lismore, NSW 2480

Re: Letter of Support – Research – Supporting Mums to Quit

Dear Dr Passey,

Dharah Gibern Aboriginal Medical Service is excited by this research initiative and wishes to express strong support. There is a paucity of data available on this subject, accordingly it has been a difficult issue to address, it is anticipated that new data and information will allow meaningful and successful educational or health promotion programs to be developed.

Yours Sincerely

Jeff Richardson
CEO
Dr Megan Passey  
Northern Rivers University Dept of Rural Health  
61 Uralla St  
LISMORE NSW 2480

Dear Dr Passey

Research – Supporting Mums to Quit

Thank you for your letter regarding the proposed research into helping pregnant Aboriginal women to quit smoking and looking at attitudes to and education about alcohol and other drugs.

Maari Ma Health Aboriginal Corporation is a signatory to a Memorandum of Understanding with Greater Western Area Health Service (GWAHS) regarding two GWAHS Aboriginal Maternal Infant Health Strategy (AMIHS)-funded positions which are managed by Maari Ma. These two positions, a community midwife and Aboriginal health worker, work in the communities of Broken Hill and Wilcannia providing antenatal care to pregnant Aboriginal women.

The outline of your proposed research, as set out in your letter, looks to be an important step to providing insight into tobacco, alcohol and drug use amongst pregnant women in our communities, and how we can assist them to quit for the sake of their unborn children. Health checks and surveys of adults in our region indicate that more than 40% of Aboriginal adults smoke, higher than the non-Aboriginal population and significantly higher than figures for NSW generally. Maari Ma is implementing a chronic disease strategy in our region in conjunction with our partners, GWAHS and the Royal Flying Doctors Service: improving the health of pregnant women and their children is given primary focus in our Healthy Start program.

We have consulted with the relevant staff and see participation in your project, through surveys by AMIHS-funded staff and by these staff surveying 10 of their clients, as an important step to providing your research with a broader cross section of views and we would be pleased to be part of it. We support any efforts taken to improve the health of Aboriginal people, particularly giving our children their best possible start in life. We acknowledge the contribution your work will make towards this goal.

Please contact Cathy Dyer to make arrangements regarding the surveys with staff and clients. Cathy can be contacted on 08 8082 9832.

Yours sincerely

Richard Weston  
Regional Director  
27 June 2008
Dear Megan

At the Elders Executive meeting it was passed to give support to your program/study of smoking by pregnant Aboriginal women.

Yours In Unity

Bertha Kápeen

19-7-07
Dr Megan Passey  
Senior Lecturer  
Northern Rivers University Department of Rural Health  
PO Box 3074  
LISMORE NSW 2480

Dear Madam,

RE:  RESEARCH PROJECT FOR SMOKING PROGRAMS  
IN MATERNAL HEALTH

I wish to advise that the Walgett Aboriginal Medical Service (WAMS) Co-operative Limited is pleased to participate in this project.

WAMS are planning to secure the services of contracted Midwives. It is anticipated that this arrangement will start in February.

Mrs Karnie Walford is the Health Worker with the WAMS Midwifery program, and can be contacted on the above-mentioned phone numbers.

Ms Kylie Gilmore, Program Practice Manager, will commence Maternity Leave in early January. Mr Richard Simpson will be acting in this role until her return in approximately April.

Both Mrs Walford and Mr Simpson will work with you to complete staff surveys on their return to WAMS 5 January 2008. Thank you and kind regards.

Yours sincerely,

CHRISTINE CORBY, OAM  
CHIEF EXECUTIVE OFFICER

22 December 2008

cc.  Mrs Val Keed – AHMRC Ethics Committee  
Kylie Gilmore, Richard Simpson, Karnie Walford, Diana Dalley

Funded by the Federal Dept of Health & Ageing & the NSW Dept of State Health
Dr Megan Passey  
Northern Rivers UDRH  
PO Box 3074  
Lismore NSW 2480.

Dear Dr Passey

Re: Research Project – Supporting Mums to Quit

I am writing on behalf of the Murrin Bridge Aboriginal Health Service in response to your letter requesting support to undertake the research project “Supporting Mums to Quit”.

We understand that the project has been approved by the AH&MRC Ethics Committee.

We support this research project being undertaken in our area.

We have high rates of smoking among our pregnant women and are concerned about the impact this has on the health of both the mother and baby.

We believe that this project should be useful in helping us address this.

Yours sincerely

[Signature]

Cecil Lester  
CEO

18 November 2008.
7th November 2008

Dr Megan Passey
Northern Rivers UDRH
PO Box 3074
Lismore NSW 2480

Dear Dr Passey,

Re: Research Project – Supporting Mums to Quit

I am writing on behalf of the Awabakal Newcastle Aboriginal Co-operative Ltd in response to your letter requesting support to undertake the research project “Supporting Mums to Quit”. We understand that the project has been approved by the AH&MRC ethics committee.

The Awabakal Newcastle Aboriginal Co-operative Ltd supports this research project being undertaken in the communities served by our health service. Smoking in pregnancy is an area of considerable concern to us due to the impact on the health of both the mother and the baby. We believe that this project should be useful in helping us address this.

Yours Sincerely,

Kevin McKenny
CHIEF EXECUTIVE OFFICER

Supported by
NSW Health Department
ATSIC
OATSIIH
Aging & Disability
DoCS
Dr Megan Passey  
Northern Rivers UDRH  
PO Box 3074  
Lismore NSW 2480

Re: Research Project – Supporting Mums to Quit

Dear Dr Passey

I am writing on behalf of the Peak Hill Aboriginal Medical Service Inc., in regard to the research project "Supporting Mums to Quit" that you wish to undertake.

The Peak Hill Aboriginal Medical Service Inc. supports this research project being undertaken in the communities served by our health service. Smoking in pregnancy is a priority area for our service to address and this project should be useful in helping us address this.

Yours Sincerely

[Signature]

Christine Peckham  
Coordinator  
Peak Hill AMS

31 October, 2008
Dr. Megan Passey  
Senior Lecturer  
NRUDRH, University of Sydney  
61 Uralba Street  
LISMORE NSW 2480

Dear Ms Swain,

Re: Research Project - Supporting Mums to Quit.

Thank you for your email of the 28th April 2008 regarding the above project and the possible involvement of this organisation in the project.

I would like to take this opportunity to apologise for the late reply to your letter. Circumstances beyond our control have hindered our capacity to deal with your request in a timely fashion.

I must also inform you that the Board of Directors have in place a policy covering participation by our organisation in any research project. Basically the policy requires that the organisation should only participate in research initiative that seek and have been granted ethical approval from the AH&MRC’s Ethics Committee.

The other purpose for my letter is to officially notify you that your letter was tabled for consideration at our BOD meeting on the 7th October 2008, and upon reviewing the documentation that was provided to the BOD the Board is fully supportive of this research project and Board now requires that a submission be made to the AH&MRC’s Ethics Committee for ethical approval. And subject to the approval of Ethics Committee the Board is willing for this organisation to participate in the project.

Should any further information or advice be required please do not hesitate contacting the CEO Mr. Frank Vincent on the telephone number below during office hours

Yours truly,

Brad Deleaney  
Chairman

16 October 2008
Thursday, 4 September 2008

Re: Letter of Support

As the CEO of the Tamworth Aboriginal Medical Service, I am providing this letter of support for the research proposal titled: Supporting Mums to Quit, that will be conducted by Megan Passey, Jenny Gale, Rob Sanson-Fisher, the AMIHS Team and Director of Aboriginal Health - North Coast Area Health Service.

There are vast health implications of smoking on the mother, children and family.

I feel that this research would be extremely beneficial to the Aboriginal Community and to the Public Health System by providing research and data on preventative strategies and information to support Aboriginal mother to quit smoking.

Regards,

Robert Barker-Salt
CEO
Tamworth Aboriginal Medical Service.
26th June 2008

Dr Megan Passey
Northern Rivers UDRH
PO Box 3074
Lismore NSW 2480

Re: Research Project – Supporting Mums to Quit

Dear Dr Passey

I am writing on behalf of the Pat Dixon Medical Centre Aboriginal Medical Service in regard to the research project “Supporting Mums to Quit” that you wish to undertake. The Pat Dixon Medical Centre Aboriginal Medical Service supports this research project being undertaken in the communities served by our health service. Smoking in pregnancy is a priority area for our service to address and this project should be useful in helping us address this.

Yours Sincerely,

[Signature]

---

Armidale Aboriginal Health Service Inc.
Pat Dixon Medical Centre
100 Taylor Street
PO Box 1057
Armidale NSW 2350
Ph (02) 6774 9450
Fax (02) 6774 9455

for “Koori Health in Koori Hands”

Tingha Clinic
Community Health Centre
Inverell Road Tingha
Ph (02) 6723 3096
29\textsuperscript{th} August 2008

Dr Megan Passey
Northern Rivers UDRH
PO Box 3074
Lismore NSW 2480

Dear Dr Passey

Re: research Project – Supporting Mums to Quit

I am writing on behalf of Thubbo Aboriginal Medical Cooperative in regard to the research project “Supporting Mums to Quit” that you wish to undertake in our community. Thubbo Aboriginal Medical Cooperative supports this research project being undertaken in our communities served by our health service.

The number of Aboriginal mums who smoke has been difficult for us to address and this project should provide useful information for us.

Looking forward to working in partnership with you on this study.

Yours Sincerely

Irene Peachey
1st August 2008

Dr Megan Passey
Northern Rivers UDRH
PO Box 3074
Lismore NSW 2480

Re: Research Project – Supporting Mums to Quit

Dear Dr Passey

I am writing on behalf of the Durri Aboriginal Corporation Medical Service in regard to the research project “Supporting Mums to Quit” that you wish to undertake. The Durri Aboriginal Corporation Medical Service supports this research project being undertaken in the communities served by our health service. Smoking in pregnancy is a priority area for our service to address and this project should be useful in helping us address this.

Yours Sincerely

Ros Roach
Acting Chief Executive Officer
Durri Aboriginal Corporation Medical Service

All donations $2.00 and above are tax deductible. Please make cheques payable to Durri Aboriginal Corporation Medical Service

Durri ACMS is a funding initiative of both the Commonwealth and NSW Department of Health
Min-Min Aboriginal Corporation
1-55 Elgin Street
Gunnedah NSW 2380
Po Box 877,
Gunnedah NSW 2380

28th August, 2008

Phone - 0267 424121
Fax - 0267 425152

This letter is in response to Research-Supporting Mums to Quit Smoking.

Min-min Corporation received a letter from you typed on 30th June, 2008 requesting permission to conduct a study in Gunnedah area.
Finding out what would help pregnant Aboriginal women quit smoking, you also stated a program will be developed to help the women Quit smoking.

On behalf of Min-Min Corporation Committee and Community members you have our permission to be involve with the second stage of the research study to help pregnant Aboriginal Women Quit Smoking.

If you have any queries please do not hesitate to contact me on the above phone number.

Regards

Debbie Stead
Min Min Executive

Gwen Griffin/Chair Person
Debbie Steadman/Secretary
4.2 Ethics approvals for New South Wales surveys
4.2.1 Ethics approval for the New South Wales surveys from Hunter New England, NSW Health
5 June 2008

Professor R Sanson-Fisher
School of Medicine & Public Health
David Maddison Building
University of Newcastle

Dear Professor Sanson-Fisher,

Re: Supporting Mums to Quit (08/02/20/4.01)

HNEHREC Reference No: 08/02/20/4.01
NSW HREC Reference No: 08/HNE/10

Thank you for submitting the above protocol which was first considered by the Hunter New England Human Research Ethics Committee at its meeting held on 20 February 2008. This Human Research Ethics Committee is constituted and operates in accordance with the National Health and Medical Research Council’s National Statement on Ethical Conduct in Human Research (2007) (National Statement) and the CPMP/ICH Note for Guidance on Good Clinical Practice.

As part of the procedure for ethical approval of research involving humans in Hunter New England Health the above protocol has reviewed by the Clinical Trials Subcommittee, an advisory group of the Hunter New England Human Research Ethics Committee.

I am pleased to advise that following receipt of the requested clarifications and revised Information Sheets by the Professional Officer, the Hunter New England Human Research Ethics Committee has granted ethical approval of the above project.

The following documentation has been reviewed and approved by the Hunter New England Human Research Ethics Committee:

- The Service Provider Information Sheet for Study on tobacco, alcohol and cannabis use in pregnancy (Version 3 dated 12 May 2008);
- The Women’s Information Sheet for Study on tobacco, alcohol and cannabis use in pregnancy (Version 3 dated 12 May 2008);
- The Invitation Letter to AMIHS teams Part 1 (Version 2 dated 25 March 2008);
- The Invitation Letter to AMIHS teams Part 2 (Version 2 dated 25 March 2008);
- The Consent Form for Study on tobacco, alcohol and cannabis use in pregnancy (Version 2 dated 29 February 2008);
- The Health Issues during Pregnancy Questionnaire; and
- The Healthcare Provider Views – smoking, alcohol and other drugs during pregnancy Questionnaire.

For the protocol: Supporting Mums to Quit

Approval from the Hunter New England Human Research Ethics Committee for the above protocol is given for a maximum of 3 years from the date of this letter, after which a renewal application will be required if the protocol has not been completed.
The *National Statement on Ethical Conduct in Human Research* (2007), which the Committee is obliged to adhere to, includes the requirement that the committee monitors the research protocols it has approved. In order for the Committee to fulfil this function, it requires:

- A report of the progress of the above protocol be submitted at 12 monthly intervals. Your review date is **June 2009**. A proforma for the annual report will be sent two weeks prior to the due date.

- A final report be submitted at the completion of the above protocol, that is after data analysis has been completed and a final report compiled. A proforma for the final report will be sent two weeks prior to the due date.

- All variations or amendments to this protocol, including amendments to the Information Sheet and Consent Form, must be forwarded to and approved by the Hunter New England Human Research Ethics Committee prior to their implementation.

- The Principal Investigator will immediately report anything which might warrant review of ethical approval of the project in the specified format, including:
  - any serious or unexpected adverse events
    - Adverse events, however minor, must be recorded as observed by the Investigator or as volunteered by a participant in this protocol. Full details will be documented, whether or not the investigator or his deputies considers the event to be related to the trial substance or procedure.
  - Serious adverse events that occur during the study or within six months of completion of the trial at your site should be reported to the Professional Officer of the Hunter New England Human Research Ethics Committee as soon as possible and at the latest within 72 hours.
  - Copies of serious adverse event reports from other sites should be sent to the Hunter New England Human Research Ethics Committee for review as soon as possible after being received.
  - Serious adverse events are defined as:
    - Causing death, life threatening or serious disability.
    - Cause or prolong hospitalisation.
    - Overdoses, cancers, congenital abnormalities whether judged to be caused by the investigational agent or new procedure or not.
    - unforeseen events that might affect continued ethical acceptability of the project.

- If for some reason the above protocol does not commence (for example it does not receive funding); is suspended or discontinued, please inform Dr Nicole Gerrand, the Professional Officer of the Hunter New England Human Research Ethics Committee as soon as possible.

The Hunter New England Human Research Ethics Committee also has delegated authority to approve the commencement of this research on behalf of the Hunter New England Area Health Service. This research may therefore commence.
Should you have any queries about your project please contact Dr Nicole Gerrand as per her contact details at the bottom of the page. The Hunter New England Human Research Ethics Committee Terms of Reference, Standard Operating Procedures, membership and standard forms are available from the Hunter New England Area Health Service website:

Internet address:

Please quote 08/02/20/4.01 in all correspondence.

The Hunter New England Human Research Ethics Committee wishes you every success in your research.

Yours faithfully

For:
Dr M Parsons
Chair
Hunter New England Human Research Ethics Committee
4.2.2 Ethics approval for the New South Wales surveys from the Aboriginal Health & Medical Research Council
Dear Dr Passey,

Supporting Mums to Quit: Smoking intervention research for pregnant rural Aboriginal women (656/08)

The Aboriginal Health and Medical Research Council (AH&MRC) Ethics Committee has considered your application of 9 July 2008 for ethics approval for the above project. The additional information provided in your emails of 6 August 2008 and 26 August 2008 are considered to be part of your application.

The Committee agreed to approve the application, subject to the conditions below.

Standard Conditions of Approval (where applicable to the project)

1. The approval is for the period from 8 September 2008 until 30 September 2009, with extension for an additional period subject to providing a report on the research by 30 September 2009.
2. All research participants are to be provided with a relevant Participant Information Statement and Consent Form in the format provided with your application.
3. Copies of all signed participant consent forms must be retained and made available to the Ethics Committee on request. A request will only be made if there is a dispute or complaint in relation to a participant.
4. Any changes to the staffing, methodology, timeframe, or any other aspect of the research relevant to continued ethical acceptability of the project must have the prior written approval of the Ethics Committee.
5. The research must continue throughout to comply with:
   • the AH&MRC Guidelines for Research in Aboriginal Health – Key Principles;
   • the National Statement on Ethical Conduct in Research Involving Humans (2007); and
   • the NSW Aboriginal Health Information Guidelines.
6. A final draft report must be provided to the AH&MRC Ethics Committee to be reviewed for compliance with ethical and cultural criteria prior to:
• any submission for publication; and/or
• any dissemination of the report.

7. A copy of the final published version of any publication is to be provided to the AH&MRC Ethics Committee.

Special Conditions of Approval

8. The Committee should be provided with a copy of a letter of support from a participating ACCHS prior to the research beginning with that ACCHS.

Please acknowledge receipt of this letter and your acceptance of the above conditions within fourteen (14 days).

We would also appreciate your agreement that the AH&MRC may, on request, obtain access to the data obtained from the research in order to assist the future development of policy and programs in Aboriginal health.

We take this opportunity to wish you well in your research.

On behalf of the AH&MRC Ethics Committee,

Yours sincerely,

Val Keed
Chairperson
AH&MRC Ethics Committee
4.2.3 Ethics approval for the New South Wales surveys from the University of Newcastle
HUMAN RESEARCH ETHICS COMMITTEE

APPROVAL TO CONDUCT HUMAN RESEARCH

To Chief Investigator or Project Supervisor: Laureate Professor Robert Sanson-Fisher
Cc Co-investigators / Research Students: Ms Jennifer Gale
Ms Catherine Leatherday
Ms Robyn Martin
Ms Brenda Holt
Dr Megan Passey

Re Protocol: Supporting mums to quit: Smoking intervention research for pregnant rural Aboriginal women
Date: 07-Sep-2008
Reference No: H-2008-0254

Thank you for your recent application to the University of Newcastle Human Research Ethics Committee (HREC) for approval of the protocol identified above.

A Certificate of Approval is enclosed.

THE CERTIFICATE AND THIS ADVICE ARE TO BE RETAINED THEY ARE IMPORTANT DOCUMENTS

- Note any comments related to the approval.
- Where the HREC is the lead or primary HREC, if the research requires the use of an Information Statement, ensure the Reference No. is inserted into the complaints paragraph in the approved document(s) prior to distribution to potential participants.
- Where the research is the project of a higher degree candidate, it is the responsibility of the project supervisor to ensure that the candidate receives this approval advice.

Conditions of Approval

This approval has been granted subject to you complying with the requirements for Monitoring of Progress, Reporting of Adverse Events, and Variations to the Approved Protocol as detailed below.

PLEASE NOTE:
In the case where the HREC has "noted" the approval of an External HREC, progress reports and reports of adverse
events are to be submitted to the External HREC only. In the case of Variations to the approved protocol, you will apply to the External HREC for approval in the first instance and then Register that approval with the University’s HREC.

- **Monitoring of Progress**

Other than above, the University is obliged to monitor the progress of research projects involving human participants to ensure that they are conducted according to the protocol as approved by the HREC. The Certificate of Approval identifies the period for which approval is granted and your progress report schedule. A progress report is required on an annual basis, you will be advised when a report is due.

- **Reporting of Adverse Events**

1. It is the responsibility of the person first named on the Certificate to report adverse events.

2. Adverse events, however minor, must be recorded by the investigator as observed by the investigator or as volunteered by a participant in the research. Full details are to be documented, whether or not the investigator, or his/her deputies, consider the event to be related to the research substance or procedure.

3. Serious or unforeseen adverse events that occur during the research or within six (6) months of completion of the research, must be reported by the person first named on the Certificate to the (HREC) by way of the Adverse Event Report form within 72 hours of the occurrence of the event or the investigator receiving advice of the event.

4. Serious adverse events are defined as:
   - Causing death, life threatening or serious disability.
   - Causing or prolonging hospitalisation.
   - Overdoses, cancers, congenital abnormalities, tissue damage, whether or not they are judged to be caused by the investigational agent or procedure.
   - Causing psycho-social and/or financial harm. This covers everything from perceived invasion of privacy, breach of confidentiality, or the diminution of social reputation, to the creation of psychological fears and trauma.
   - Any other event which might affect the continued ethical acceptability of the project.

5. Reports of adverse events must include:
   - Participant's study identification number;
   - date of birth;
   - date of entry into the study;
   - treatment arm (if applicable);
   - date of event;
   - details of event;
   - the investigator's opinion as to whether the event is related to the research procedures; and
   - action taken in response to the event.

6. Adverse events which do not fall within the definition of serious, including those reported from other sites involved in the research, are to be reported in detail at the time of the annual progress report to the HREC.

- **Variations to approved protocol**

If you wish to change, or deviate from, the approved protocol, you will need to submit an Application for Variation to Approved Human Research. Variations may include, but are not limited to, changes or additions to investigators, study design, study population, number of participants, methods of recruitment, or participant information/consent documentation. **Variations must be approved by the (HREC) before they are implemented** except when Registering an approval of a variation from an external HREC which has been designated the lead HREC, in which case you may proceed as soon as you receive an acknowledgement of your Registration.

**Linkage of ethics approval to a new Grant**
HREC approvals cannot be assigned to a new grant or award (ie those that were not identified on the application for ethics approval) without confirmation of the approval from the Human Research Ethics Officer on behalf of the HREC.

With best wishes for a successful project.

Professor Val Robertson
Chair, Human Research Ethics Committee

For communications and enquiries:
Ms Genevieve Farrell
Human Research Ethics Officer

Research Services
Research Office
The University of Newcastle
Callaghan NSW 2308
T +61 2 492 16333
F +61 2 492 17164
Genevieve.Farrell@newcastle.edu.au

HUMAN RESEARCH ETHICS COMMITTEE
Certificate of Approval

<table>
<thead>
<tr>
<th>Applicant: (first named in application)</th>
<th>Laureate Professor Robert Sanson-Fisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-Investigators / Research Students:</td>
<td>Ms Jennifer Gale</td>
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<td></td>
<td>Ms Catherine Leatherday</td>
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<td>Ms Robyn Martin</td>
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<td></td>
<td>Ms Brenda Holt</td>
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<td></td>
<td>Dr Megan Passey</td>
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<tr>
<td>Protocol:</td>
<td>Supporting mums to quit: Smoking intervention research for pregnant rural Aboriginal women</td>
</tr>
</tbody>
</table>

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Note: Approval is granted subject to the requirements set out in the accompanying document Approval to Conduct Human Research, and any additional comments or conditions noted below.

Details of Approval

<table>
<thead>
<tr>
<th>HREC Approval No: H-2008-0254</th>
<th>Date of Initial Approval: 13-Aug-2008</th>
</tr>
</thead>
</table>

Approved to: 12-Aug-2011

Approval is granted to this date or until the project is completed, whichever occurs first. If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.
**Progress reports due:** Annually.

*If the approval of an External HREC has been "noted", the reporting period is as determined by that HREC.*

<table>
<thead>
<tr>
<th>Initial Approval</th>
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<tr>
<td>13-Aug-2008</td>
</tr>
<tr>
<td>External HREC Approval Noted</td>
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<tr>
<td>HNEHREC Reference No.: 08/02/20/4.01</td>
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<tr>
<th>Renewal of Approval</th>
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<tbody>
<tr>
<td>Variations to Approved Protocol</td>
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</table>

**Authorised Certificate held in Research Services**

Professor Val Robertson  
Chair, Human Research Ethics Committee
4.3 Letter to Aboriginal Maternal and Infant Health Strategy coordinators
Letter to Aboriginal Maternal and Infant Health Strategy coordinators

[date]
[names]
[address]

Re: Research – Supporting Mums to Quit

Dear [names]

We are contacting you as the coordinator of the Aboriginal Maternal and Infant Health Strategy (AMIHS) program in your area to request your permission to conduct a study with your AMIHS teams. The purpose of this state-wide survey is to find out what would help pregnant Aboriginal women quit smoking so that we can develop a program to help women quit.

The study is being conducted by a team of researchers (Megan Passey, Jenny Gale and Rob Sanson-Fisher), the AMIHS team at Ballina (Brenda Holt and Catherine Leatherday), and the Director of Aboriginal Health for North Coast Area Health Service (Robyn Martin). The research program is supported by the Bundjalung Elders Council and Ngayundi Health Council, and is being conducted with guidance from a Community Reference Group composed of community Elders, young women from the community, Aboriginal Health Workers and Aboriginal workers from other community organisations. NSW Health is aware of the study and supports it taking place.

This study is part of a program of research involving three different stages.

1. The first stage was a study undertaken on the North Coast where we conducted focus groups and one-on-one interviews with pregnant women about smoking.
2. factors affecting smoking and quitting, and their views on what would help women quit. At the request of the Bundjalung Elders Council, the study also included use of alcohol and other drugs in pregnancy.

3. The second stage is the study that we are contacting you about, and is a state-wide survey to see if the issues women talked about in the North Coast are also important in other communities in NSW.

4. The third stage will involve development and evaluation of a quitting program based on the results of the first two studies.

We are seeking your support for the second study – the state-wide survey which has two parts:

1. A confidential and anonymous survey of all the staff working with the NSW AMIHS program and the doctors that work with them

2. A confidential and anonymous survey of women currently accessing antenatal care from the AMIHS teams.

The staff survey covers tobacco smoking and use of alcohol and cannabis by pregnant women, attitudes to providing advice to women, opinions on why women smoke, the barriers to quitting and the benefits of quitting, and their views on the value of specific strategies in helping women quit.

The women’s questionnaire covers tobacco smoking, use of cannabis and alcohol, what advice they have received regarding this during their pregnancy, values, beliefs and knowledge about the risks of smoking and other substance use during pregnancy, barriers or enhancers to women reducing their substance use, and their views on the value of specific strategies in helping women quit. Both surveys will be completely confidential and anonymous.

Each AMIHS team will be asked to:

1. Complete the questionnaire, “Healthcare provider views – smoking, alcohol and other drugs during pregnancy”. Each member of the team (midwife and
AHW/AHEO or other staff member) will be asked to complete the questionnaire individually.

2. Invite the doctors that they work with in providing antenatal care to complete the questionnaire, “Healthcare provider views – smoking, alcohol and other drugs during pregnancy”. This includes both GPs and obstetricians.

3. Invite the next 10 women they see to take part by completing the questionnaire, “Health issues during pregnancy”.

Participation in this study is entirely voluntary for both staff and pregnant women, but we are hoping that we will get a good response rate from all the teams across NSW and the ACT, so that we can get a good picture of everyone’s views on the issues. This will help us in designing a quitting program that is both practical and addresses women’s needs.

We will also be reporting the findings back to an AMIHS forum for everyone to see the results and discuss them. This will help with interpretation of the findings and understanding the implications for the development of the intervention.

We have included copies of the Service Provider Information Sheet and the Women’s Information Sheet. These provide more detail about the study and how the ethical issues will be managed.

In order to proceed with this study we need a number of approvals. Firstly we need ethics approval from a lead ethics committee in the NSW Health system. We have submitted an ethics application to the Hunter New England AHS Ethics committee for this. Secondly, we need permission from other ethics committees – the Aboriginal Health and Medical Research Council (AHMRC), the University of Newcastle, and the University of Sydney.

We also need permission from each of the communities involved. For this we will be writing to the CEOs of each of the AMSs involved and the Directors of Aboriginal
Health for each AHS and asking them to consult with local community representatives through their normal mechanisms, and request permission to undertake the study in their area.

Finally, we need permission from each AHS to undertake the study in their Area. There is a specific form that needs to be completed for this – the Site Specific Assessment (SSA) form, which is signed by the Chief Executive of the AHS. Before we can complete the SSA form, we need to consult with the coordinators of the AMIHS program and the Directors of Aboriginal Health for each AHS, and seek their permission to conduct the study in their area.

One of us will call you in the next few weeks to see if you have any questions or concerns, but if you want to contact us before that, please do so through the contact details below.

If you are willing to provide permission for us to undertake the study in your area, could you please write a letter indicating your support, and providing us with a list of the teams and staff members (with their contact details) working in your area.

Dr Megan Passey (Researcher)  
Brenda Holt (Aboriginal Health Education Officer)  
or Jenny Gale (Research Assistant)  
or Catherine Leatherday (Community Midwife)  
NRUDRH, University of Sydney  
AMIHS team, Ballina Community Health  
61 Uralba St  
Cherry St  
Lismore, NSW 2480  
Ballina, NSW 2478  
Tel: 6620 7570  
Tel: 6686 8977  
Email: Megan.Passey@ncahs.health.nsw.gov.au  
Brenda.Holt@ncahs.health.nsw.gov.au  
Jenny.Gale@ncahs.health.nsw.gov.au  
Catherine.Leatherday@ncahs.health.nsw.gov.au
Robyn Martin (Director Aboriginal Health, NCAHS)
NCAHS
PO Box 26
Port Macquarie, NSW 2444
Tel: 6588 2865
Robyn.Martin@ncahs.health.nsw.gov.au

We look forward to hearing from you at your earliest convenience.

Kind regards

Megan Passey
Robyn Martin
4.4 Letter to Aboriginal Maternal and Infant Health Strategy teams
– Parts 1 and 2
Dear [names]

We are contacting you to invite you to be part of a study we are running. The purpose of the study is to find out what would help pregnant Aboriginal women quit smoking so that we can develop a program to help women quit.

The study is being conducted by a team of researchers (Megan Passey, Jenny Gale and Rob Sanson-Fisher), the Maternal and Infant Health team at Ballina (Brenda Holt and Catherine Leatherday), and the Director of Aboriginal Health for North Coast Area Health Service (Robyn Martin).

The study has been approved by the Hunter New England Area Health Service ethics committee. We have also had approval from the coordinator of the Aboriginal Maternal and Infant Health Strategy (AMIHS) (name) and the Director of Aboriginal Health for your area (name) and the CEOs of the AMSs in your area (names).

The study has two parts – a survey of service providers and a survey of pregnant women. We are asking for your assistance in a number of ways:
1. Firstly, we would like you and your colleagues in the AMIHS program to participate by completing the attached questionnaire, “Healthcare provider views – smoking, alcohol and other drugs during pregnancy”.

2. We would like you to invite the doctors that you work with in providing antenatal care to complete the questionnaire, “Healthcare provider views – smoking, alcohol and other drugs during pregnancy”. This includes both GPs and obstetricians that you usually work with. You do not need to include any doctors that you have only had occasional contact with.

3. Once you have returned your questionnaires, we will send you another package of questionnaires, information sheets and consent forms for women. We would like you to invite 10 women to take part by completing a different questionnaire, “Health issues during pregnancy”.

Participation in this study is entirely voluntary, but we would be very grateful if you would help us. If we can get a good response rate from all the teams across NSW and the ACT, we will get a very good picture of everyone’s views on the issues, so we can design a quitting program that really works. We will also be reporting the findings back to an AMIHS forum for you all to see the results and discuss them. This will help with interpretation of the findings and understanding the implications for the development of the intervention.

We have included copies of the Service Provider Information Sheet and the Women’s Information Sheet. These provide more detail about the study and how the ethical issues will be managed. Please read these carefully. It is important that each person who is invited to participate receives the appropriate information sheet, and has the opportunity to read it and ask any questions. The researchers can be contacted by phone or email as indicated on the information sheets. Please call us with any questions or issues you have before you start inviting other people to participate, and again if others have questions you need answered.
What do you need to do?

1. Read the information sheets and contact us if you have any questions or concerns.
2. Identify one member of your team to act as the main coordinator for collecting all the forms.
3. If you decide to take part, first fill in a consent form and sign it, and then fill in the questionnaire. Both forms should then be placed in one of the plain envelopes. Seal the envelope and give it to the person who is collecting the forms.
4. Invite the doctor(s) you work with to participate by explaining the study to them, and then giving them the Service Provider Information Sheet, a consent form, a copy of the questionnaire, “Healthcare provider views – smoking, alcohol and other drugs during pregnancy”, and a plain envelope to seal their forms in. Arrange to collect the completed surveys.
5. The person coordinating the collection of all the forms should collect them and place them into the reply-paid envelopes. These must be treated as confidential documents and kept in a secure place until posting to the research team. Please post them back to us as soon as you have all the forms returned.

Once we receive your questionnaires, we will send you another package with the documents for the women to complete.

Thank you for your assistance with this. Please don’t hesitate to contact us if you have any questions.

With kind regards

Dr Megan Passey
02 6620 7570
Megan.passey@ncahs.health.nsw.gov.au
Dear [names],

Thank you for returning your completed questionnaires for our study on tobacco, alcohol and cannabis use in pregnancy. We are now asking for your assistance with the second part of the study – recruiting pregnant women to complete a questionnaire.

The study is being conducted by a team of researchers (Megan Passey, Jenny Gale and Rob Sanson-Fisher), the Maternal and Infant Health team at Ballina (Brenda Holt and Catherine Leatherday), and the Director of Aboriginal Health for North Coast Area Health Service (Robyn Martin). The study has been approved by the Hunter New England Area Health Service ethics committee and the AHMRC ethics committee.

We would now like you to invite pregnant women in your area to complete the questionnaire, “Health issues during pregnancy”. If we can get a good response rate across NSW and the ACT, we will get a very good picture of women’s views on the issues, so we can design a quitting program that really works. As with the survey that you participated in, we will be reporting the findings from the women, back to an AMIHS forum for you all to see the results and discuss them. This will help with interpretation of the findings and understanding the implications for the development of the intervention. The summary information will not identify individuals or areas/communities.
We have included copies of the *Women’s Information Sheet*. This provides more detail about the study and how the ethical issues will be managed. Please read it carefully. It is important that each woman who is invited to participate receives the information sheet, and has the opportunity to read it and ask any questions. The researchers can be contacted by phone or email as indicated on the information sheets. Please call us with any questions or issues you have before you start inviting women to participate, and again if the women have questions you need answered.

**What do you need to do?**

1. Read the Information Sheets and contact us if you have any questions or concerns.

2. Identify one member of your team to act as the main coordinator for collecting all the forms.

3. The start date for the study is [insert date]. On that date we want you to start recruiting women to the study. You should invite every woman you see for antenatal care until you have 10 completed questionnaires.

4. You will need to first assess them to make sure they are eligible. They must be currently pregnant and accessing your services, be Aboriginal or Torres Strait Islander themselves or non-Indigenous but pregnant with an Indigenous partner, and normally resident in your area. They should not be included if they are aged less than 16 years, currently being treated for a mental illness, or unable to provide informed consent (if you think that for some reason they are not able to make an informed decision, then you should not invite them).

5. Explain the study to them – what it will involve and that their participation is voluntary. You should give them the Women’s Information Sheet to read and answer any questions they have. They should not be coerced to take part and if they decline, then this should not affect the care you provide to them.

6. If they decide to take part, then give them a copy of the consent form, the “*Health issues during pregnancy*” questionnaire, and a plain envelope to seal their completed forms in.
7. If they need any assistance in completing the consent form or questionnaire, please help them.

8. It is possible that some women may become a bit distressed while completing the questionnaire if it brings up personal issues for them. We ask that you be there to assist them if this happens. If necessary, we also ask that you refer them to additional services through your usual referral networks. However, we do not think this is likely to be necessary.

9. Collect the sealed envelopes from the women.

It is important that you invite every eligible woman until you have 10 completed questionnaires, so that it is an unbiased process. We don't want you to wait to invite the ones you think are most likely to participate or that fit into a particular group. We want a representative sample so that we get a clear picture of the real situation.

We would also like you to record the age and parity of any women who choose not to complete the survey. This will allow us to assess bias in who participated. However, this information can only be recorded with the permission of the woman. So it is necessary for you to ask her if this is OK. You should explain to her that you will not include her name or anything else about her.

The person coordinating the collection of all the forms should collect them and place them into the reply-paid envelope. The questionnaires must be treated as confidential documents and kept in a secure place until posting to the research team. Please post them back to us as soon as you have all the forms returned.

Thank you for your assistance with this. Please don’t hesitate to contact us if you have any questions.
With kind regards

Dr Megan Passey
02 6620 7570
Megan.passey@ncahs.health.nsw.gov.au
4.5 Information sheets
4.5.1 Service Provider Information Sheet
Service Provider Information Sheet

Study on tobacco, alcohol and cannabis use in pregnancy

We are running a study to find out what would help pregnant Aboriginal women who smoke to quit. We are inviting you to take part in this study by completing a survey. The study is being conducted by Dr Megan Passey and Jenny Gale at the Northern Rivers University Department of Rural Health in Lismore, Brenda Holt and Catherine Leatherday, who provide antenatal care to Aboriginal women in the Ballina area, Robyn Martin, the Director of Aboriginal Health for North Coast Area Health Service, and Prof Rob Sanson-Fisher at the University of Newcastle. The study is part of Dr Passey’s studies at the University of Newcastle and is being supervised by Prof Rob Sanson-Fisher from the School of Medicine and Public Health.

Why is the study being done?
The purpose of the study is to get a better understanding of why some pregnant Aboriginal women smoke. We want to find out what the issues are and ways to help women quit smoking so we can develop a program to help them quit. The study will also find out about the issues that service providers face when trying to help women quit smoking. This will help us ensure that the program we develop is realistic and feasible. The survey is being conducted during 2008.

Who is being invited to participate?
We are inviting all service providers working with the NSW Aboriginal Maternal and Infant Health Strategy (AMIHS), including Aboriginal Health Workers, Aboriginal Health Education Officers and Midwives. We are also inviting the doctors who work with the teams to provide antenatal care. Pregnant women in each area will be invited to complete a different survey.

What choice do you have?
Participating in this survey is voluntary. If you don’t want to join in that is entirely up to you and won’t affect your relationship with the research team. Also, you don’t have to answer any questions you feel uncomfortable with.

What will it involve?
If you chose to participate please complete the consent form and the survey and seal them both in the envelope provided. The survey is anonymous and will cover smoking tobacco and yarndi (cannabis) and use of alcohol by pregnant women. It asks how common you think it is, the risks associated, your role in giving advice to women, the challenges of helping women quit, and what would help them quit. It will take about 20 minutes to complete.
What are the risks and benefits of participating?
There will be no immediate benefits to taking part. However, the information will be used to develop a program to help pregnant women quit smoking. So, it may influence your services in the future. There are no risks associated with completing the survey.

How will your privacy be protected?
The questionnaire is anonymous. The information you give us will be kept strictly confidential and your privacy respected. The member of your team who is responsible for collecting everyone’s envelopes will place them in a reply-paid envelope and post them to the researchers. They will not look at your survey form. When your envelope is received, the consent forms will be separated from the surveys and stored separately so we won’t be able to tell who completed each form. The forms will be stored securely and only the research team will have access to them. Information will not be passed on to any other people. No person or team will be identified in any of the results.

How will the information be used?
The surveys will all be entered onto a data base and summarised with a statistical program. It will not be possible to identify information from any individual or from any particular program. The data will be stored securely and only the research team will have access to it.

Once we have finished summarising the information we will present it back to an AMIHS program meeting. We hope there will be discussion about the results to assist in interpreting and understanding them. We will also discuss how you wish to be acknowledged in the final report. After that we will present the findings to the study’s steering committee and write a report for the Commonwealth Department of Health and Ageing and NSW Health. A copy of the report will be sent to each AMIHS team, together with several copies of a summary report to give to women who participate. We will also report the results at conferences and write them up for health journals, and they will be included in Megan’s thesis. We will not identify anyone individually in any of these reports. Most importantly, we will use the information to develop a program to help women quit smoking.

What will happen to the information after we have written all the reports?
Once we have finished writing the reports the information will be stored safely for seven years. We will keep the original surveys and the computer files at the University. Only the research team will have access to these. After seven years, all the information will be destroyed.

What do you need to do to participate?
All you have to do is complete the consent form and the survey and place them both in the individual envelope provided. The member of your team who is responsible for collecting everyone’s envelopes will place them in a reply-paid envelope and post them to the researchers.
Any questions?

If you would like to contact us with any questions or comments, please don’t hesitate – just give us a call, or send an email.

**Contact details of the study team**

Megan Passey (Senior Lecturer)  
or Jenny Gale (Research Assistant)  
Northern Rivers University Department of Rural Health  
61 Uralba St  
Lismore, NSW 2480  
Tel: 6620 7570  
Email: Megan.Passey@ncahs.health.nsw.gov.au  
Jenny.Gale@ncahs.health.nsw.gov.au

Brenda Holt (Aboriginal Health Education Officer)  
or Catherine Leatherday (Community Midwife)  
AMIHS team, Ballina Community  
Cherry St  
Ballina, NSW 2478  
Tel: 6686 8977  
Email: Brenda.Holt@ncahs.health.nsw.gov.au  
Catherine.Leatherday@ncahs.health.nsw.gov.au

Professor Rob Sanson-Fisher  
School of Medicine and Public Health  
University of Newcastle  
Newcastle, NSW 2300  
Tel: 4923 6169  
Email: Rob.Sanson-Fisher@newcastle.edu.au  
Robyn.Martin@ncahs.health.nsw.gov.au

Robyn Martin (Director Aboriginal Health, NCAHS)  
NCAHS  
PO Box 26  
Port Macquarie, NSW 2444  
Tel: 6588 2865  
Email: Robyn.Martin@ncahs.health.nsw.gov.au

**Complaints about the study**

This study has been approved by the Hunter New England Human Research Ethics Committee of Hunter New England Health, reference number 08/02/20/4.01. If you have any concerns or complaints about the study, you can report them to the Ethics Committee by contacting the Professional Officer (Research Governance and Ethics), Hunter New England Human Research Ethics Committee, Hunter New England Health, Locked Bag 1, New Lambton, NSW 2305 or Tel: (02) 4921 4950, or Email: hnehrec@hnehealth.nsw.gov.au

Thank you for considering this invitation.

Megan Passey  
Jenny Gale  
Brenda Holt  
Catherine Leatherday  
Rob Sanson-Fisher  
Robyn Martin
4.5.2 Women’s Information Sheet
Women's Information Sheet

Study on tobacco, alcohol and cannabis use in pregnancy

This is a study to find out what would help pregnant Aboriginal women who smoke to quit smoking. You are invited to take part in this study by completing a survey. The study is being run by Dr Megan Passey and Jenny Gale at the Northern Rivers University Department of Rural Health in Lismore, Brenda Holt and Catherine Leatherday, who look after Aboriginal women when they are having babies in the Ballina area, Robyn Martin, the Director of Aboriginal Health for North Coast Area Health Service and Prof Rob Sanson-Fisher at the University of Newcastle. The study is part of Dr Passey’s studies at the University of Newcastle and is being supervised by Prof Rob Sanson-Fisher from the School of Medicine and Public Health. The survey is being run during 2008.

Why is the study being done?
The purpose of the study is to get a better understanding of why some pregnant Aboriginal women smoke. We want to pinpoint the issues so we can design a quitting program that really works.

Who is being invited to participate?
We are inviting pregnant Aboriginal women in NSW and the ACT to take part. You have been invited because you are being cared for in your pregnancy by the midwife or health worker who gave you this information sheet. It doesn’t matter if you are a smoker or not. We want to hear everyone’s ideas. We are running the survey in 28 sites in NSW and the ACT and hope that 10 women in each area will agree to fill it in.

What choice do you have?
It is up to you whether you do the survey. You don’t have to answer any questions you feel uncomfortable with. If you don’t want to join in that is entirely up to you. It won’t affect the care you get in your pregnancy or your relationship with the health service.

What will it involve?
If you chose to take part please fill in the consent form and sign it. Then fill in the survey and seal them both in the envelope provided. Hand the sealed envelope to the midwife or health worker who gave it to you. The survey covers smoking tobacco and yarndi (cannabis) and use of alcohol. It asks about the risks of using these things, why it’s hard for some women to quit and what sorts of things would help women quit. It will take about 20 minutes.
What are the risks and benefits of participating?

There will be no immediate benefits to taking part. However, the information will be used to develop a program to help pregnant women quit smoking. So, it may influence health services in the future. You may feel a bit worried about some things after you fill in the survey form. If you are feeling upset, please let the health worker know and talk with her about it.

How will your privacy be protected?

Only the research team will see your survey form. The form does not have your name or any other information that would link it back to you. The midwife or Health Worker will post all the forms back to the researchers. They will not look at your survey form unless you ask them for help with it. When we get your envelope we will remove the consent form and store it separately so we won’t be able to tell who completed each form. The forms will be stored safely and only the research team will have access to them. Information will not be passed on to any other people. No person or area will be identified in any of the reports.

How will the information be used?

The surveys will be entered onto a data base and the results summarised. The results will be written up in a report for health services and for the Health Department. We will also report the results at conferences and write them up for health journals, and they will be included in Megan’s thesis. We will send a copy of the report to the health worker who invited you to take part. We will also send them some brief reports to give to the women who took part. We will not identify anyone individually in any of these reports. Most importantly, we will use the information to develop a program to help Aboriginal women quit smoking.

What will happen to the information after we have written all the reports?

The information will be stored safely for seven years. We will keep the original survey forms and the computer files at the University. Only the research team will have access to these. After seven years, all the information will be destroyed.

What do you need to do to join in?

If you chose to join in please complete the consent form and the survey and seal them both in the envelope provided. Hand the sealed envelope to the health worker who gave it to you.

Any questions?

If you would like to contact us with any questions or comments, please don’t hesitate – just give us a call, or send an email. Your health worker may be able to help you with this.
Contact details of the study team

Megan Passey (Senior Lecturer)  Brenda Holt (Aboriginal Health Education Officer)
or Jenny Gale (Research Assistant)  or Catherine Leatherday (Community Midwife)

Northern Rivers University Department of Rural Health  AMIHS team, Ballina Community Health

61 Uralba St  Cherry St
Lismore, NSW 2480  Ballina, NSW 2478
Tel: 6620 7570  Tel: 6686 8977
Email: Megan.Passey@ncahs.health.nsw.gov.au  Brenda.Holt@ncahs.health.nsw.gov.au
    Jenny.Gale@ncahs.health.nsw.gov.au  Catherine.Leatherday@ncahs.health.nsw.gov.au

Professor Rob Sanson-Fisher  Robyn Martin (Director Aboriginal Health, NCAHS)
School of Medicine and Public Health  University of Newcastle
University of Newcastle  NCAHS
Newcastle, NSW 2300  PO Box 26
Tel: 4923 6169  Port Macquarie, NSW 2444
Email: Rob.Sanson-Fisher@newcastle.edu.au  Tel: 6588 2865
    Robyn.Martin@ncahs.health.nsw.gov.au

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Thank you for considering this invitation.

Megan Passey  Jenny Gale  Brenda Holt  Catherine Leatherday  Rob Sanson-Fisher  Robyn Martin
4.6 Consent form
Consent Form

Study on tobacco, alcohol and cannabis use in pregnancy

Principal Researchers: Dr Megan Passey, Prof Rob Sanson-Fisher

1. I agree to take part in the study described in the Information Sheet and give my consent freely.
2. I have read and understood the Information Sheet which explains the purpose of the study and what will be required of me. I have been given a copy of the Information Sheet to keep.
3. I consent to completing a questionnaire.
4. I have been given the opportunity to ask any questions I have about the study. I have received satisfactory answers to any questions that I have asked.
5. I understand that my participation is voluntary and that I am free to withdraw at any time without affecting my relationship with the health service or the university.
6. I understand that my personal information will remain confidential to the researchers.
7. I agree that the information gathered from the results of the study may be published, and recognize that there will be no identifying information included in any publications.
8. I understand that if I have any questions related to the study I may contact Dr Megan Passey at the Northern Rivers University Department of Rural Health on 6620 7570, or by email on megan.passey@ncahs.health.nsw.gov.au

Signature: ____________________________ Date: ________________

Complaints about the study

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4.7 Staff questionnaire
Please fill in the circle next to your response with black or blue pen
For example: Like this: ● NOT like this: ○
PLEASE DO NOT FOLD THIS SURVEY

Smoking, Alcohol and Other Drugs During Pregnancy Survey 2009

Q1. What is your gender?
○ Male ○ Female

Q2. Are you Aboriginal or Torres Strait Islander?
○ Yes ○ No

Q3. What is your position?
○ Aboriginal Health worker
○ Aboriginal Health Education Officer
○ Midwife
○ Nurse
○ Doctor
○ Other (please describe) ________________________________

Q4. Where is your service based?
○ Aboriginal Community Controlled Medical Service
○ Area Health Service facility
○ Other (please describe) ________________________________

Smoking tobacco during pregnancy
We are seeking your opinion. If you are not sure, please make your best estimate.

Q5. In your opinion, what percentage of women in your area smoke tobacco?
Please indicate the percentage among:
A) Aboriginal women generally?
B) Aboriginal women throughout pregnancy?
C) Aboriginal women in the first 6 months after giving birth?

Q6. For every 100 pregnant patients you see:
A) With optimal care, for what number should you know whether they smoke tobacco?
B) In real life, what number do you actually ask whether they smoke tobacco?
Q7. In your opinion, of the pregnant women you see:
A) What percentage of smokers would agree to try to quit if given brief advice about quitting with an offer of support during the first antenatal consultation?  
B) What percentage of smokers would try to quit during the first week after the consultation?  
C) What percentage of smokers would not be smoking at the end of their pregnancy?  

Q8. How true are the following statements for you in relation to giving quit smoking advice to pregnant Aboriginal women: (PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)  

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) It is one of the main things that can be done to help women have healthy babies</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>B) Giving advice about smoking to these women is not worth it given the small level of success</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>C) My health service has a responsibility to encourage pregnant women to quit</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>D) I'd like to give anti-smoking advice but I don't have the skills</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>E) The harms of smoking in pregnancy are minor compared to other risks women face</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>F) I don't want to push women away from antenatal care by advising them to quit smoking</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>G) It's an individual choice. It's not up to me to advise a woman to quit smoking</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>H) Our Aboriginal community see helping pregnant women quit as a high priority</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I) Helping women quit smoking makes me feel proud of my role</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>J) If I could get 60% of women who smoke to agree to try to quit I'd make it a high clinical priority</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Q9. Please indicate your views about the following statements in relation to pregnant Aboriginal women quitting smoking tobacco: (PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)  

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Pregnancy is a time when most women are more motivated to quit than usual</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>B) It's harder to quit during pregnancy than other times</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>C) Nicotine replacement therapy (patches, gum etc.) can help women quit</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>D) Nicotine replacement therapy shouldn't be used in pregnancy</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>E) There is no point in stopping smoking late in pregnancy</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>F) Women will try to quit for their children even if they won't try for themselves</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>G) Women who smoke yarndi find it harder to quit tobacco</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>H) Women smoke to bury their pain</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I) Women smoke to suppress their emotions</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>J) Most women who quit in pregnancy, start again when the baby is born</td>
<td>○</td>
<td></td>
<td>○</td>
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</tr>
<tr>
<td>K) An effective way to quit during pregnancy is to just stop altogether, right away</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>L) An effective way to quit during pregnancy is to reduce by 1 to 2 cigarettes each day</td>
<td>○</td>
<td></td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

PLEASE TURN OVER
Q10. Please indicate how useful you think each of the following would be in helping pregnant Aboriginal women quit smoking:

(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

<table>
<thead>
<tr>
<th>A) Provision of free nicotine replacement therapy (patches or gum)</th>
<th>Very helpful</th>
<th>Somewhat helpful</th>
<th>Maybe helpful</th>
<th>Not helpful</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>B) Advice and support from the midwife</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C) Advice and support from the health worker</td>
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<td></td>
<td></td>
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<tr>
<td>D) Advice and support from the doctor</td>
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<td></td>
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<tr>
<td>E) Support for the whole family to help others quit</td>
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<td></td>
<td></td>
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<tr>
<td>F) Stress management programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>G) Support groups (with other women quitting)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>H) Support person (a non-smoker to help them through it)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I) Massage for stress relief</td>
<td></td>
<td></td>
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<tr>
<td>J) Other pampering (facials, pedicures etc.)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>K) Community activities about quitting</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>L) Brochures about the harms of smoking with advice on how to quit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M) Rewards for women who stop smoking with vouchers to get things for the mother or baby. There would be testing to make sure the woman has quit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>N) Access to a telephone Quitline</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Q11. What do you think are the five biggest reasons some women in your community have trouble quitting smoking tobacco?

1. 
2. 
3. 
4. 
5. 

Please indicate your views about the following statements:

Q12. Smoking tobacco during pregnancy increases the risk of:

(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

<table>
<thead>
<tr>
<th>A) Miscarriage (losing the baby)</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>B) Low birth weight of baby</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C) Breathing problems and sickness in the infant</td>
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<tr>
<td>D) Mother having high blood pressure and increased heart rate</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E) Behavioural problems in childhood</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Alcohol during pregnancy
We are seeking your opinion. If you are not sure, please make your best estimate.

Q13. In your opinion, what percentage of women in your area consume alcohol at least once a month? Please indicate the percentage among:

A) Aboriginal women generally? %
B) Aboriginal women throughout pregnancy? %
C) Aboriginal women in the first 6 months after giving birth? %

Q14. For every 100 pregnant patients you see:

A) With optimal care, for what number should you know whether they drink alcohol? %
B) In real life, for what number do you actually ask whether they drink alcohol? %

Q15. How true are the following statements for you in relation to giving alcohol reduction advice to pregnant Aboriginal women:

(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

A) It it one of the main things that can be done to help women have healthy babies
   Strongly agree  Agree  Disagree  Strongly disagree
B) Giving advice about drinking to these women is not worth it given the small level of success
   Strongly agree  Agree  Disagree  Strongly disagree
C) My health service has a responsibility to encourage pregnant women to quit drinking
   Strongly agree  Agree  Disagree  Strongly disagree
D) I'd like to give advice about not drinking but I don't have the skills
   Strongly agree  Agree  Disagree  Strongly disagree
E) The harms of drinking in pregnancy are minor compared to other risks women face
   Strongly agree  Agree  Disagree  Strongly disagree
F) I don't want to push women away from antenatal care by advising them to quit drinking
   Strongly agree  Agree  Disagree  Strongly disagree
G) Its an individual choice. Its not up to me to advise a woman to quit drinking
   Strongly agree  Agree  Disagree  Strongly disagree
H) Our Aboriginal community see helping pregnant women quit drinking as a high priority
   Strongly agree  Agree  Disagree  Strongly disagree
I) Helping women quit drinking makes me feel proud of my role
   Strongly agree  Agree  Disagree  Strongly disagree
J) If I could get 60% of women who drink to agree to try to quit, I'd make it a high clinical priority
   Strongly agree  Agree  Disagree  Strongly disagree

Please indicate your views about the following statements:

Q16. Alcohol consumption during pregnancy increases the risk of:

(Please colour the best response in each row)

A) Miscarriage (losing the baby)  Strongly agree  Agree  Disagree  Strongly disagree  Not sure
B) Birth defects (baby not developing normally)  Strongly agree  Agree  Disagree  Strongly disagree  Not sure
C) Blocked arteries  Strongly agree  Agree  Disagree  Strongly disagree  Not sure
D) Diabetes in the mother  Strongly agree  Agree  Disagree  Strongly disagree  Not sure
E) Behavioural problems in childhood  Strongly agree  Agree  Disagree  Strongly disagree  Not sure

PLEASE TURN OVER
Smoking Cannabis/Yarndi During Pregnancy
As the use of cannabis is common in some communities and it is often mixed with tobacco, we are also interested in your views on the use of cannabis in your area.

Q17. In your opinion, what percentage of women in your area smoke cannabis/yarndi?
Please indicate the percentage among:
A) Aboriginal women generally? %
B) Aboriginal women throughout pregnancy? %
C) Aboriginal women in the first 6 months after giving birth? %

Q18. For every 100 pregnant patients you see:
A) With optimal care, for what number should you know whether they smoke yarndi? 
B) In real life, for what number do you actually ask whether they smoke yarndi? 

Q19. How true are the following statements for you in relation to giving cannabis/yarndi smoking cessation advice to pregnant Aboriginal women:
(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)
A) It is one of the main things that can be done to help women have healthy babies
B) Giving advice about smoking yarndi to these women is not worth it given the small level of success
C) My health service has a responsibility to encourage pregnant women to quit yarndi
D) I'd like to give advice about not smoking yarndi but I don't have the skills
E) The harms of smoking yarndi in pregnancy are minor compared to other risks women face
F) I don't want to push women away from antenatal care by advising them to quit smoking yarndi
G) It's an individual choice. It's not up to me to advise a woman to quit smoking yarndi
H) Our Aboriginal community see helping pregnant women quit smoking yarndi as a high priority
I) Helping women quit smoking yarndi makes me feel proud of my role
J) If I could get 60% of women who smoke yarndi to agree to try to quit, I'd make it a high clinical priority

Please indicate your views about the following statements:
Q20. Smoking yarndi during pregnancy increases the risk of:
(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)
A) Miscarriage (losing the baby)
B) Low birth weight of baby
C) Breathing problems and sickness in the infant
D) Mother having high blood pressure and increased heart rate
E) Behavioural problems in childhood

PLEASE TURN OVER
Q21. Please write any other comments or suggestions


TOBACCO SMOKING HISTORY

Q22. Which statement best describes you?
○ I'm a smoker, I smoke daily
○ I'm a smoker, I smoke occasionally
○ I'm an ex-smoker; I never smoke now
○ I'm a non-smoker, I have never smoked

QUESTION 23 IS FOR EX-SMOKERS ONLY

Q23. A) What year did you stop smoking? 

B) What caused you to quit smoking (colour as many as you want)
○ Pregnancy ○ Children in the house with asthma
○ Health scare ○ Sick relatives in the house
○ Cost of cigarettes ○ Television
○ Children telling me to ○ Health warnings on packets
○ Advice from other health staff ○ Family or friends asked me to
○ Smoking restrictions in public places ○ Other 

Q24. Please fill in today's date:   /   /   For example 31/01/09

THANK YOU FOR HELPING US
WE APPRECIATE YOUR TIME AND EFFORT

THE INFORMATION FROM THIS SURVEY WILL BE USED TO DEVELOP A PROGRAM TO HELP WOMEN QUIT SMOKING AND DRINKING DURING THEIR PREGNANCY
4.8 Women’s questionnaire
Health Issues During Pregnancy

A questionnaire for pregnant Aboriginal and Torres Strait Islander women, or pregnant women with Indigenous partners, in New South Wales.

The information from this survey will be used to develop a quitting program to help women quit smoking and drinking during their pregnancy.

Please answer all the questions honestly and frankly, as correct information is essential in developing an effective and realistic intervention. We will not pass on your information to anyone else.

The Researchers

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Megan Passey</td>
<td>Northern Rivers Department of Rural Health University of Sydney</td>
<td>02 6620 7570</td>
</tr>
<tr>
<td>Prof Rob Sanson-Fisher</td>
<td>Faculty of Health University of Newcastle</td>
<td>02 4923 6169</td>
</tr>
<tr>
<td>Robyn Martin</td>
<td>Director Aboriginal Health North Coast Area Health Service</td>
<td>02 6577 2865</td>
</tr>
<tr>
<td>Brenda Holt</td>
<td>Aboriginal Maternal and Infant Health, Ballina Community Health NCAHS</td>
<td>02 6686 8977</td>
</tr>
<tr>
<td>Catherine Leatherday</td>
<td>Aboriginal Maternal and Infant Health, Ballina Community Health NCAHS</td>
<td>02 6686 8977</td>
</tr>
<tr>
<td>Jenny Gale</td>
<td>Northern Rivers Department of Rural Health University of Sydney</td>
<td>02 6620 7570</td>
</tr>
</tbody>
</table>

Please Note: We use the term Aboriginal to refer to both Aboriginal and Torres Strait Islander peoples, in line with NSW Health Policy.
About You

Q1. How old are you? __________

Q2. Are you Aboriginal or Torres Strait Islander?  ○ Yes  ○ No

Q3. What was the highest year you completed at school?
   ○ 5  ○ 6  ○ 7  ○ 8  ○ 9  ○ 10  ○ 11  ○ 12

Q4. Have you done any courses at TAFE or University?  ○ Yes  ○ No

Q5. What is the postcode where you usually live? __________

Q6. How many adults and children usually live with you, not counting yourself? __________ __________

Q7. How many weeks pregnant are you? __________

Q8. How many children have you given birth to? __________

Q9. How many times have you seen a doctor this pregnancy? __________

Q10. How many times have you seen the midwife or health worker this pregnancy? __________

Q11. Was this a planned pregnancy or did it just happen?  ○ Planned  ○ It just happened

About You and Tobacco

Q12. Which of the following describes you best?
   ○ I smoke every day
   ○ I smoke occasionally (not every day)
   ○ I’m an ex-smoker; I never smoke now
   ○ I have never smoked

If you have never smoked cigarettes, please go straight to Q21 ON THE NEXT PAGE.
If you smoke cigarettes now, or used to smoke cigarettes, please answer Q13 to Q20 first.

Q13. Have you had a cigarette in the last 7 days (even a puff)?  ○ Yes  ○ No

Q14. Have you changed your level of smoking since you found out you were pregnant?
   PLEASE COLOUR THE BEST RESPONSE
   Increased a lot  ○  Increased a little  ○  Stayed the same  ○  Decreased a little  ○  Decreased a lot  ○  Quit completely  ○  I quit before I got pregnant  ○  I quit before I got pregnant

DHFSAPREG2008
Q15. How old were you when you first started smoking? □ □

Q16. Thinking back to when you started smoking, was it easy for children to buy cigarettes? ○ Yes ○ No

Q17. Have children ever told you that you shouldn't smoke? ○ Yes ○ No

Q18. If you are a smoker, how many times have you tried to quit smoking in the last year? □ □ ○ I am not a smoker

Q19. If you are a smoker, how many cigarettes do you usually smoke each day? □ □ ○ I am not a smoker

Question 20 is for ex-smokers only

Q20a. In what year did you stop smoking? □ □ □ □

Q20b. What caused you to quit smoking? (select as many as you want)
○ Pregnancy ○ Children in the house with asthma ○ Advice from health staff
○ Health scare ○ Sick relatives in the house ○ Smoking restrictions in public places
○ Cost of cigarettes ○ Television ○ Family or friends asked me to
○ Children telling me to ○ Health warnings on packets ○ Other _______________________

The Next Set of Questions is for Everyone

Q21. How useful do you think each of the following would be in helping pregnant women quit smoking:

PLEASE COLOUR THE BEST RESPONSE IN EACH ROW

<table>
<thead>
<tr>
<th>A) Provision of free nicotine replacement therapy (patches or gum)</th>
<th>Very helpful</th>
<th>Somewhat helpful</th>
<th>Maybe helpful</th>
<th>Not helpful</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>B) Advice and support from the health worker</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>C) Advice and support from the midwife</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>D) Advice and support from the doctor</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>E) Support for the whole family to help others quit</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>F) Stress management programs</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>G) Support groups (with other women quitting)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>H) Support person (a non-smoker to help them through it)</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>I) Massage for stress relief</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>J) Other pampering (facials, pedicures, etc.)</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>K) Community activities about quitting.</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>L) Brochures abou the harms of smoking with advice on how to quit</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>M) Rewards for women who stop smoking with vouchers to get things for the mother or baby. There would be testing to make sure the woman has quit.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>N) Access to a telephone Quitline.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</table>

PLEASE TURN OVER
Please select the best response

Q22. Has your doctor, health worker or midwife asked you whether you smoke tobacco in this pregnancy?
   ○ Yes  ○ No  ○ I don't remember

Q23. If you are a smoker, did they advise you to quit smoking during the pregnancy?
   ○ Yes  ○ No  ○ I don't remember  ○ I'm not a smoker

Q24. If you are a smoker, did they offer to support you to quit smoking during the pregnancy?
   ○ Yes  ○ No  ○ I don't remember  ○ I'm not a smoker

Q25. What do you think are the five biggest reasons that some pregnant women in your community don't quit smoking tobacco?
   1. __________________________________________
   2. __________________________________________
   3. __________________________________________
   4. __________________________________________
   5. __________________________________________

About You and Alcohol

Q26. In the last month, how often have you had a drink containing alcohol?
   ○ Never
   ○ Only once
   ○ 2 to 4 times in the month
   ○ 2 to 3 times a week
   ○ 4 or more times a week

If you have never drunk alcohol, please go straight to Q29.
If you drink alcohol now, or used to drink alcohol, please answer Q27 and Q28 first.

Q27. Have you changed your level of drinking since you found out you were pregnant?
   PLEASE COLOUR THE BEST RESPONSE

<table>
<thead>
<tr>
<th>Increased a lot</th>
<th>Increased a little</th>
<th>Stayed the same</th>
<th>Decreased a little</th>
<th>Decreased a lot</th>
<th>Quit completely</th>
<th>I quit before I got pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
</tr>
</tbody>
</table>

Q28. How old were you when you first started drinking?

Please select the best response

Q29. Has your doctor, health worker or midwife asked you whether you drink alcohol in this pregnancy?
   ○ Yes  ○ No  ○ I don't remember

Q30. If you do drink alcohol, did they advise you to quit drinking during the pregnancy?
   ○ Yes  ○ No  ○ I don't remember  ○ I don't drink alcohol

Q31. If you do drink alcohol, did they offer to support you to quit drinking during the pregnancy?
   ○ Yes  ○ No  ○ I don't remember  ○ I don't drink alcohol
About You and Yarndi (also called cannabis, dope or gunja)

Q32. Colour the circle for the response that best describes you.

☐ I smoke yarndi every day
☐ I smoke yarndi occasionally (not every day)
☐ I'm an ex-yarndi smoker; I never smoke yarndi now
☐ I have never smoked yarndi

If you have never smoked yarndi, please go straight to Q37.
If you have used to smoke yarndi, please answer Q33 to Q36 first

Q33. Have you smoked yarndi in the last 7 days (even a puff)?  ☐ Yes  ☐ No

Q34. Have you changed your habit of smoking yarndi since you found out you were pregnant?

Please colour the best response

<table>
<thead>
<tr>
<th>Increased a lot</th>
<th>Increased a little</th>
<th>Stayed the same</th>
<th>Decreased a little</th>
<th>Decreased a lot</th>
<th>Quit completely</th>
<th>I quit before I got pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
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</tbody>
</table>

Q35. How old were you when you first started smoking yarndi?  ■■

Q36. If you are a yarndi smoker, how many cones or joints do you usually smoke each day?

☐ I am not a yarndi smoker

The Rest of the Questions are for Everyone

Please select the best response

Q37. Has your doctor, health worker or midwife asked you whether you smoke yarndi in this pregnancy?

☐ Yes  ☐ No  ☐ I don't remember

Q38. If you are a yarndi smoker, did they advise you to quit smoking yarndi during the pregnancy?

☐ Yes  ☐ No  ☐ I don't remember  ☐ I'm not a yarndi smoker

Q39. If you are a yarndi smoker, did they offer to support you to quit smoking yarndi during the

☐ Yes  ☐ No  ☐ I don't remember  ☐ I'm not a yarndi smoker

Other Household Members

Q40. How many of the adults you live with smoke tobacco (not counting yourself)?  ■■

Q41. How many of the adults you live with drink alcohol (not counting yourself)?  ■■

Q42. How many of the adults you live with smoke yarndi (not counting yourself)?  ■■

Q43. Where do people usually smoke tobacco in your home? (tick the box that describes you best)

☐ Mostly inside  ☐ Mostly outside  ☐ Inside and outside

PLEASE TURN OVER
### Ideas about Pregnancy

**Q44. Do you agree or disagree with these ideas about pregnancy?**

<table>
<thead>
<tr>
<th>Idea</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) It's good to have a smaller baby.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>B) I think my baby will be born healthy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>C) Light smoking does not cause harm to unborn babies.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>D) Stopping smoking increases the chance of having a healthy baby.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>E) If you are around a lot of smoke from other people you might as well keep smoking yourself.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>F) It's OK to drink alcohol when you're pregnant as long as you don't drink a lot.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>G) Quitting smoking is just too hard. It's not worth the effort.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>H) It's OK to drink alcohol when you're pregnant, as long as you don't binge more than once a month.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>I) Yarndi is OK when you're pregnant because it's natural.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>J) It's harder to quit smoking during pregnancy because of all the worries.</td>
<td>○</td>
<td>○</td>
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<tr>
<td>K) You've got to die of something so why give up the things you enjoy.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>L) Women will try to give up smoking and drinking for their children even if they won't try for themselves.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>M) In our community it's OK to smoke when you are pregnant.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>N) Most women have bigger problems to deal with than trying to quit smoking and drinking.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>O) Health care providers should tell pregnant women to quit smoking tobacco.</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>P) Health care providers should tell pregnant women to quit using alcohol and drugs.</td>
<td>○</td>
<td>○</td>
<td>○</td>
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</tbody>
</table>

**Please indicate if you agree or disagree with these ideas**

**Q45. Smoking tobacco during pregnancy increases the chances of:**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) miscarriage (losing the baby)</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>B) low birth weight of baby</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>C) breathing problems and sickness in the infant</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>D) mother having high blood pressure and increased heart rate</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>E) behavioural problems in childhood</td>
<td>○</td>
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</table>

**Q46. Drinking alcohol during pregnancy increases the chances of:**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) miscarriage (losing the baby)</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>B) birth defects (baby not developing normally)</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>C) blocked arteries</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>D) diabetes in the mother</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>E) behavioural problems in childhood</td>
<td>○</td>
<td>○</td>
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</tbody>
</table>
Q47. Smoking yarndi during pregnancy increases the chances of:

- A) miscarriage (losing the baby)
- B) low birth weight of baby
- C) breathing problems and sickness in the infant
- D) mother having high blood pressure and increased heart rate
- E) behavioural problems in childhood

<table>
<thead>
<tr>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
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</table>

Q48. Are you aware that there is a free Quitline service that you can ring?  ○ Yes  ○ No

Please colour the best response

Q49. In a typical week, how often do you watch TV?

- Every day
- 4-6 days per week
- 1-3 days per week
- Less than once a week
- Never

Q50. How often do you go inside places where smoking is banned? (e.g. cafes, schools, public transport)

- Every day
- 4-6 days per week
- 1-3 days per week
- Less than once a week
- Never

Q51. Do you have a telephone that you can use (you can mark more than one type of phone if you wish)?

- ○ Yes, a mobile phone
- ○ Yes, a landline
- ○ No, I don't have a phone I can use

Q52. Did anyone help you complete this questionnaire?

- ○ Yes
- ○ No

Q53. Please fill in today’s date:  /  /  For example 30/06/08

THANK YOU FOR HELPING US
WE APPRECIATE YOUR TIME AND EFFORT
4.9 Participation log for women
Women’s Participation Record

Study on tobacco, alcohol and cannabis use in pregnancy

Please remember to record every woman you see, even if she doesn’t complete a survey

<table>
<thead>
<tr>
<th>Date</th>
<th>Eligible? (Yes / No)</th>
<th>Age</th>
<th>Parity</th>
<th>Agreed to participate? (Yes / No)</th>
<th>Comments</th>
</tr>
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Appendix 5
5.1 Ethics approvals for Northern Territory surveys
5.1.1 Ethics approvals for Menzies School of Health Research
05 September 2008

Professor Rob Sanson-Fisher
Tenured Professor of Health Behaviour
University of Newcastle
Faculty of Medicine and Health Services
NEWCASTLE NSW 2300

Dear Professor Sanson-Fisher,

Re: 06/08 - Exploring the knowledge and attitudes of Aboriginal Medical Service staff and antenatal clients regarding smoking and alcohol consumption during pregnancy

Thank you for your letters dated 22 August 2008 and 29 August 2009.

The Human Research Ethics Committee (HREC) Chair of the NT Department of Health and Families and Menzies School of Health Research, has considered and approved the finalized version of the Staff questionnaire for the above study. The Chair notes that the questionnaire has undergone pilot testing.

The following documents were reviewed and approved by the Chair:

1. Healthcare provider views – smoking and alcohol during pregnancy
2. Women’s information sheet for Health issues during pregnancy
3. Participant Invitation and Information sheet

**Full approval** is now granted. The Committee is satisfied that the research proposal meets the requirements of the NH&MRC National Statement on Ethical Conduct in Human Research, 2nd ed, 2007.

This approval will be ratified at the next meeting of the Human Research Ethics Committee to be held 15/10/2008

Please note that HREC approval applies only to research conducted after this date of this letter.

**Approved from the date of this letter until 30/6/2009**

This approval is for a period of twelve (12) months. A project progress report is required by **20/5/2009**.

Please note the terms under which ethical approval is granted:

1. The safe and ethical conduct of this project is entirely the responsibility of the investigators and their institution(s).
2. Researchers should report immediately anything which might affect continuing ethical acceptance of the project, including:
   a) adverse effects of the project on subjects and the steps taken to deal with these,
   b) other unforeseen events,
   c) new information that may invalidate the ethical integrity of the study,
   d) Proposed Changes in the project
3. Approval for a further twelve months will be granted if the HREC is satisfied that the conduct of the project has been consistent with the original protocol.

4. Confidentiality of research participants should be maintained at all times as required by law.

5. The Patient Information Sheet and the Consent Form shall be printed on the relevant site letterhead with full contact details.

6. The Patient Information Sheet must provide a brief outline of the research activity including, risks and benefits, withdrawal options, contact details of the researchers and must also state that the Human Research Ethics Secretary can be contacted (telephone and email) for information concerning policies, rights of participants, concerns or complaints regarding the ethical conduct of the study.

7. The Committee must also be notified at the completion of the project.

Yours sincerely

Dr Michael Nixon
Chair

Human Research Ethics Committee
of NT Dept of Health & Families
and Menzies School of Health Research
5.1.2 Ethics approval for University of Newcastle
HUMAN RESEARCH ETHICS COMMITTEE

APPROVAL TO CONDUCT HUMAN RESEARCH
VARIATION TO APPROVED PROTOCOL

To Chief Investigator or Project Supervisor: Laureate Professor Robert Sanson-Fisher

Cc Co-investigators / Research Students: Conjoint Professor Sandra Eades
Dr Megan Passey

Re Protocol: Exploring the knowledge and attitudes of Aboriginal Medical Service staff and antenatal clients regarding smoking and alcohol consumption during pregnancy

Date: 18-Aug-2008
Reference No: H-138-1105

Further to your recent Application for Variation to Approved Human Research which has now been approved, your Certificate of Approval has been reissued to reflect the variation and is attached.

The Certificate and this advice are to be retained
They are important documents

Professor Val Robertson
Chair, Human Research Ethics Committee

For communications and enquiries:
Ms Genevieve Farrell
Human Research Ethics Officer

Research Services
Research Office
The University of Newcastle
Callaghan NSW 2308
T +61 2 492 16333
F +61 2 492 17164
Genevieve.Farrell@newcastle.edu.au

Funding Details

<table>
<thead>
<tr>
<th>Funding body</th>
<th>Funding project title</th>
<th>First named investigator</th>
<th>Administering institution</th>
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HUMAN RESEARCH ETHICS COMMITTEE

Certificate of Approval

Applicant: (first named in application)  Laureate Professor Robert Sanson-Fisher
Co-Investigators / Research Students:  Conjoint Professor Sandra Eades
                                      Dr Megan Passey
Protocol:  Exploring the knowledge and attitudes of Aboriginal Medical Service staff and antenatal clients regarding smoking and alcohol consumption during pregnancy

In approving this protocol, the Human Research Ethics Committee (HREC) is of the opinion that the project complies with the provisions contained in the National Statement on Ethical Conduct in Human Research, 2007, and the requirements within this University relating to human research.

Note: Approval is granted subject to the requirements set out in the accompanying document Approval to Conduct Human Research, and any additional comments or conditions noted below.

Details of Approval

<table>
<thead>
<tr>
<th>HREC Approval No:</th>
<th>Date of Initial Approval:</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-138-1105</td>
<td>16-Nov-2005</td>
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</tbody>
</table>

Approved to: 15-Nov-2008

Approval is granted to this date or until the project is completed, whichever occurs first. If the approval of an External HREC has been "noted" the approval period is as determined by that HREC.

Progress reports due: Annually.

If the approval of an External HREC has been "noted", the reporting period is as determined by that HREC.

Initial Approval

16-Nov-2005

Approved

The Committee ratified the approval granted by the Chair on 11 November 2005, which was with the following comments:

1. It is acknowledged that the researcher gave an undertaking to forward, when available, approvals from the Northern Territory Human Research Ethics Committee and the Northern Territory Department of Health and Community Services (NT DHCS), document amendments requested by the NT DHCS, and translations if deemed necessary.
2. The HREC to be provided with the final formatted versions of letters, Information Statements, Consent Forms and Questionnaires as they will be presented to potential participants.

9 June 2006
Response to above received and acknowledged.
Approval confirmed.
Renewal of Approval

Variations to Approved Protocol

13-Aug-2008

Variation to:

1. Add Dr Megan Passey to the research team.

2. Remove Miss Conor Gilligan from the research team.

3. Amend the Health care provider information sheet to include:
   
   The addition of Dr Megan Passey's contact details.
   The removal of Miss Conor Gilligan's contact details.
   The addition of a sentence in the paragraph "Why is this research being done?" explaining that the data collected will be used to create a smoking intervention for pregnant Aboriginal women.
   Additional sentences in the paragraph titled "What choice do you have?" which emphasises the voluntary nature of the project and confirms that no disadvantages will be experienced if people choose not to participate.
   The addition of information in the paragraph titled "What are the risks and benefits of participating?" which explain the benefits of the study.
   The addition of a sentence within the paragraph titled "How will privacy be protected? which explains that only research staff will have access to the information included, and that no identifying information will be used in the results of the study.
   An additional sentence within the paragraph titled "How will information collected be used?" which explains the smoking intervention program that will be developed using the information provided in the research.

(Version 4, dated 4.7.2008)

4. Amend the Management Staff Participant Information Statement to include:

   The addition of information about Dr Megan Passey.
   The removal of information about Miss Conor Gilligan.
   The addition of a sentence explaining that the data collected will be used to create a smoking intervention for pregnant Aboriginal woman.
   The addition of paragraph titled "Who are we inviting to participate?"
   A re-organisation of the wording within the paragraph titled "What are we asking you to do?" and the addition of a sentence explaining that non-participation will not have any effect on employment.

(Version 4, dated 10.7.2008)

5. Amendments to the Women’s information sheet to include:

   The addition of Dr Megan Passey's contact details and those about her role as a PhD student on the project.
   The removal of Miss Conor Gilligan's contact details.
   The document titled with the name of the project.
   In the paragraph "Why is this study being done?" a sentence has been added explaining that the data will
be used to create a smoking intervention for pregnant Aboriginal women.
In the paragraph "What choices do I have?" several sentences have been added emphasising the voluntary nature of participation and that no disadvantage will be suffered by non-participants.
The re-wording of the paragraph titled "Are there any risks?" with "What are the risks and benefits?" along with a response detailing both the risks and benefits of participation.
In the paragraph titled "How will privacy be protected?" two additional sentences have been added explaining how questionnaires will remain anonymous and how this information will be stored.
In the paragraph titled "How will the information collected be used?" a sentence has been added explaining that the information will only be accessed by the research team.
A complaints section has also been added at the end of the Participant Information Statement.

(Version 4, dated 4.7.2008)

6. Amend the consent form to include Dr Megan Passey's contact details and to remove those of Miss Conor Gilligan.

(Version 4, dated 4.7.2008)
Approved
The Committee ratified the approval granted by the Deputy Chair on 15 July 2008 under the provisions for expedited review.

Authorised Certificate held in Research Services

Professor Val Robertson
Chair, Human Research Ethics Committee
5.2 Letter to staff
Dear

Researchers from the University of Newcastle and the Sax Institute in Sydney are working with the Northern Territory Department of Health and Families to find out about smoking and alcohol consumption during pregnancy. The researchers are recruiting staff at Health Services in the Northern Territory to help by completing a questionnaire. You have been identified as fitting the eligibility criteria for the study.

This letter has been sent by the Department of Health and Families (DHF) on behalf of the researchers, to protect your privacy. All responses are anonymous. Your choice to participate or not, will not be known to the DHF, and will not have any impact on your employment.

Detailed information about the study, and the questionnaire that you are asked to complete, are enclosed. You do not have an obligation to complete the questionnaire, if you do not wish.

Thank you for your co-operation.

Yours sincerely

Shane Houston
Executive Director
System Performance and Aboriginal Policy
29th December 13
5.3 Reminder letter to staff
Dear ___________

The Northern Territory Department of Health and Families has issued this letter, on behalf of the researchers from the University of Newcastle. This protocol is followed to protect your privacy.

You should have received a letter and questionnaire from us around three weeks ago. We are writing to remind you about this questionnaire. If you have sent the questionnaire, thank you, and please ignore this letter.

If you still intend to complete the questionnaire, please do so and return it within 7 days.

We appreciate your help.

Yours Sincerely,

Professor Rob Sanson-Fisher
5.4 Information sheet for staff
Health Care Provider Information Sheet

Smoking and Alcohol in Pregnancy: A Survey of Healthcare Providers

This is for you to keep

Researchers from the University of Newcastle and the Sax Institute in Sydney are working with the Northern Territory Department of Health and Families, and we need your help.

This letter has been sent by the Department of Health and Families (DHF) on behalf of the researchers, to protect your privacy.

Why is this research being done?
We are interested in exploring your views regarding smoking and alcohol consumption during pregnancy for Aboriginal and Torres Strait Islander women. We are interested in this information so we can develop a program to help pregnant women quit smoking.

Who can take part in the research?
You have been identified by the DHF as fitting the eligibility criteria for the study. Individuals are eligible if they work at any Health Service that provides antenatal care for Aboriginal or Torres Strait Islander births and is staffed by at least one Health Worker, midwife or nurse.

What choice do you have?
Taking part in this research is voluntary. You do not have to participate if you do not wish. You can decline the invitation without giving a reason. Also, you do not have to answer any questions you are not comfortable with.
**What are we asking you to do?**

We would like you to complete the attached questionnaire. It asks some simple questions about your opinions of the dangers of smoking and alcohol consumption during pregnancy, your lifestyle and your work.

**What are the risks and benefits of participating?**

There are no immediate benefits from taking part in this research. However, the information we collect will be used to develop a strategy to improve the health of Aboriginal and Torres Strait Islander women during pregnancy. No risks are associated with participation in this study.

**How will privacy be protected?**

All information collected during the study will be completely anonymous. The DHF will not be informed of your decision to take part, or not to take part. All forms will be stored securely and only the research team will have access. No person or place will be identified in the results.

**How will information collected be used?**

All data collected in the project will be coded and stored on computer files at the University of Newcastle. The data will be stored securely and only the research team will have access.

The results of this study may appear as a paper in a scientific journal. Information will not be revealed about any individuals in any reports arising from the project. The full research reports, as well as a short summary of results, will be sent to your Health Service at the end of the study. Finally, the results of this study will be specifically used to develop a program to help women quit smoking during pregnancy.

**What do you need to do to take part?**

Please read this Information Statement and make sure you understand its contents before you consent to participate. If there is anything you do not understand, or you have questions, please contact us. **If you would like to take part**, please complete the questionnaire and return it using the enclosed envelope. Please do not fold the questionnaire.

**Would you like more information?**

You may keep this Information Statement. If you would like more information about the project, please contact us. You can call any of the researchers, using the contact details below to ask any questions about the project.
Thank you for considering taking part in this project.

Rob Sanson-Fisher
Professor of Health Behaviour
University of Newcastle

Who are the other researchers?
The research will contribute to the PhD thesis of Dr Megan Passey. Dr Passey is supervised by Professor Rob Sanson-Fisher.

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Rob Sanson-Fisher</td>
<td>Faculty of Health</td>
<td>Ph: 02 49 236 169</td>
</tr>
<tr>
<td></td>
<td>University of Newcastle</td>
<td></td>
</tr>
<tr>
<td>Prof Sandra Eades</td>
<td>The Sax Institute</td>
<td>Ph: 02 9382 7648</td>
</tr>
<tr>
<td>Dr Megan Passey</td>
<td>Faculty of Health</td>
<td>Ph: 02 6620 7570</td>
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<tr>
<td></td>
<td>University of Newcastle</td>
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</tr>
<tr>
<td>Prof Shane Houston</td>
<td>Department of Health and</td>
<td>Ph: 08 8999 2993</td>
</tr>
<tr>
<td></td>
<td>Families</td>
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</tbody>
</table>

Complaints about this research
This project has been approved by the University’s Human Research Ethics Committee, Approval No. H-138-1105 and the Human Research Ethics committee of the NT Department of Health and community Services and Menzies School of Health Research HRE # 06/08.

Should you have concerns about your rights as a participant in this research, or you have a complaint about the manner in which the research is conducted, it may be given to the researcher, or, if an independent person is preferred, to the Human Research Ethics Officer, Research Office, The Chancellery, The University of Newcastle, University Drive, Callaghan NSW 2308, Australia, telephone (02) 49216333, email Human-Ethics@newcastle.edu.au.

Or
If you have any concerns or complaints you can contact the Secretary, Human Research Ethics committee of the NT Department of Health and Community Services and Menzies School of Health Research on 08 89227977 or email ethics@menzies.edu.au.
5.5 Staff questionnaire
Smoking and Alcohol during Pregnancy Survey 2008

Q1. What is your gender?
○ Male    ○ Female

Q2. Are you of Aboriginal or Torres Strait Islander Origin?
○ Yes     ○ No

Q3. What is your position?
○ Aboriginal Health worker
○ Aboriginal Health Education Officer
○ Midwife
○ Nurse
○ Doctor
○ Other (please describe) __________________________

Q4. Where is your service based?
○ Aboriginal Community Controlled Medical Service
○ Territory Health Service facility
○ Other (please describe) __________________________

Q5. Which community is your workplace situated in? __________________________

---

Smoking tobacco during pregnancy
We are seeking your opinion. If you are not sure, please make your best estimate.

Q6. In your opinion, what percentage of women in your area smoke tobacco?
Please indicate the percentage among:
A) Aboriginal women generally?   %
B) Aboriginal women throughout pregnancy? %
C) Aboriginal women in the first 6 months after giving birth? %

Q7. For every 100 pregnant patients you see:
A) With optimal care, for what number should you know whether they smoke tobacco?  
B) In real life, what number do you actually ask whether they smoke tobacco?  

---

PLEASE TURN OVER

DHFSAPREG2008
Q8. In your opinion, of the pregnant women you see:
A) What percentage of smokers would agree to try to quit if given brief advice about quitting with an offer of support during the first antenatal consultation? %
B) What percentage of smokers would try to quit during the first week after the consultation? %
C) What percentage of smokers would not be smoking at the end of their pregnancy? %

Q9. How true are the following statements for you in relation to giving quit smoking advice to pregnant Aboriginal women: (PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

A) It is one of the main things that can be done to help women have healthy babies
B) Giving advice about smoking to these women is not worth it given the small level of success
C) My health service has a responsibility to encourage pregnant women to quit
D) I’d like to give anti-smoking advice but I don’t have the skills
E) The harms of smoking in pregnancy are minor compared to other risks women face
F) I don’t want to push women away from antenatal care by telling them to quit smoking
G) It’s an individual choice. It’s not up to me to tell a woman to quit smoking
H) Our Aboriginal community see helping pregnant women quit as a high priority
I) Helping women quit smoking makes me feel proud of my role

Q10. Please indicate your views about the following statements in relation to pregnant Aboriginal women quitting smoking tobacco: (PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

A) Pregnancy is a time when most women are more motivated to quit than usual
B) It’s harder to quit during pregnancy than other times
C) Nicotine replacement therapy (patches, gum etc.) can help women quit
D) Nicotine replacement therapy shouldn’t be used in pregnancy
E) There is no point in stopping smoking late in pregnancy
F) Women will try to quit for their children even if they won’t try for themselves
G) Women who smoke yarndi/gunja find it harder to quit tobacco
H) Women smoke to bury their pain
I) Women smoke to suppress their emotions
J) Most women who quit in pregnancy, start again when the baby is born
K) An effective way to quit during pregnancy is to just stop altogether, right away
L) An effective way to quit during pregnancy is to reduce by 1 to 2 cigarettes each day

PLEASE TURN OVER
### Q11. Please indicate how useful you think each of the following would be in helping pregnant Aboriginal women quit smoking:

(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

<table>
<thead>
<tr>
<th>Option</th>
<th>Very helpful</th>
<th>Somewhat helpful</th>
<th>Maybe helpful</th>
<th>Not helpful</th>
<th>Harmful</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Provision of free nicotine replacement therapy (patches or gum)</td>
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<tr>
<td>B) Advice and support from the midwife</td>
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<tr>
<td>C) Advice and support from the health worker</td>
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<td>D) Advice and support from the doctor</td>
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<td>E) Support for the whole family to help others quit</td>
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<td>F) Stress management programs</td>
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<td>G) Support groups (with other women quitting)</td>
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<td>H) Support person (a non-smoker to help them through it)</td>
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<tr>
<td>I) Community activities about quitting</td>
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<tr>
<td>J) Brochures about the harms of smoking with advice on how to quit</td>
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<tr>
<td>K) A smoking breathalyser to test if the woman is smoking, with rewards for non-smoking</td>
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<tr>
<td>L) Access to a telephone Quitline</td>
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Please indicate your views about the following statements:

### Q12. Smoking tobacco during pregnancy increases the risk of:

(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

<table>
<thead>
<tr>
<th>Option</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly disagree</th>
<th>Not sure</th>
</tr>
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<tbody>
<tr>
<td>A) Miscarriage (losing the baby)</td>
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<td>B) Low birth weight of baby</td>
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<td>C) Breathing problems and sickness in infant</td>
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<td>D) Mother having high blood pressure and increased heart rate</td>
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<td>E) Behavioural problems in childhood</td>
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</table>
Alcohol during pregnancy
We are seeking your opinion. If you are not sure, please make your best estimate.

Q13. In your opinion, what percentage of women in your area consume alcohol at least once a month? Please indicate the percentage among:

A) Aboriginal women generally?  
B) Aboriginal women throughout pregnancy?  
C) Aboriginal women in the first 6 months after giving birth?

Q14. For every 100 pregnant patients you see:

A) With optimal care, for what number should you know whether they drink alcohol?  
B) In real life, for what number do you actually ask whether they drink alcohol?

Q15. How true are the following statements for you in relation to giving alcohol reduction advice to pregnant Aboriginal women:

(PLEASE COLOUR THE BEST RESPONSE IN EACH ROW)

A) It it one of the main things that can be done to help women have healthy babies
B) Giving advice about drinking to these women is not worth it given the small level of success
C) My health service has a responsibility to encourage pregnant women to quit drinking
D) I'd like to give advice about not drinking but I don't have the skills
E) The harms of drinking in pregnancy are minor compared to other risks women face
F) I don't want to push women away from antenatal care by telling them to quit drinking
G) Its an individual choice. Its not up to me to tell a woman to quit drinking
H) Our Aboriginal community see helping pregnant women quit drinking as a high priority
I) Helping women quit drinking makes me feel proud of my role

Please indicate your views about the following statements:

Q16. Alcohol consumption during pregnancy increases the risk of:

(Please colour the best response in each row)

A) Miscarriage (losing the baby)
B) Birth defects (baby not developing normally)
C) Blocked arteries
D) Diabetes in the mother
E) Behavioural problems in childhood

PLEASE TURN OVER
Cannabis (yarndi or gunja) during pregnancy
As the use of cannabis is common in some communities, it may be harmful during pregnancy and it is often mixed with tobacco, we are also interested in your views on the use of cannabis in your area.

Q17. In your opinion, what percentage of women in your area smoke cannabis/yarndi/gunja?
Please indicate the percentage among:
A) Aboriginal women generally? %
B) Aboriginal women throughout pregnancy? %
C) Aboriginal women in the first 6 months after giving birth? %

Q18. Please write any other comments or suggestions

Q19. Which statement best describes you?
☐ I’m a smoker, I smoke daily
☐ I’m a smoker, I smoke occasionally
☐ I’m an ex-smoker; I never smoke now
☐ I’m a non-smoker, I have never smoked

QUESTION 20 IS FOR EX-SMOKERS ONLY

Q20. A) What year did you stop smoking? [ ] [ ] [ ]

B) What caused you to quit smoking (colour as many as you want)
☐ Pregnancy
☐ Children in the house with asthma
☐ Health scare
☐ Sick relatives in the house
☐ Cost of cigarettes
☐ Television
☐ Children telling me to
☐ Health warnings on packets
☐ Advice from other health staff
☐ Family or friends asked me to
☐ Smoking restrictions in public places
☐ Other __________________________

Q21. Please fill in today’s date: [ ] [ ] [ ]  For example 30/06/08

THANK YOU FOR HELPING US
WE APPRECIATE YOUR TIME AND EFFORT

THE INFORMATION FROM THIS SURVEY WILL BE USED TO DEVELOP A PROGRAM TO HELP WOMEN QUIT SMOKING AND DRINKING DURING THEIR PREGNANCY
5.6 Instructions for recruiting women
Exploring the knowledge and attitudes of antenatal clients regarding smoking and alcohol consumption during pregnancy

What are we asking you to do?

Enclosed is a package of Women’s Information Sheets and Questionnaires. We would like you to recruit **consecutive** antenatal Aboriginal or Torres Strait Islander women to complete a short questionnaire asking about their knowledge of and attitudes towards smoking and alcohol, and their lifestyle. It is important that you assist women to complete the questionnaire, and offer translation services where necessary.

Instructions

- Every time an Aboriginal or Torres Strait Islander woman attends the antenatal clinic, you should talk to her about the study. You will need to assess the following eligibility criteria:
  - 16 years or over
  - Not being treated for any mental illness or drug dependency other than tobacco or alcohol.
- If she meets these criteria (is 16 years or more, and isn’t being treated for mental illness or drug dependency) then you should invite her to participate and provide both a written and verbal explanation of the study. It is really important that **all eligible** women are invited. However, it is also essential that women are **not pressured** to participate. Participation is voluntary, and if they don’t want to participate, this is their choice.
• If she consents to participate, ask her to sign the consent form. Place the signed consent form in the green folder marked “Signed Consent Forms”.

• Next, give her the questionnaire to complete. If she needs help, you should help her to complete the questionnaire by reading the questions and recording her responses. TRANSLATION MAY BE REQUIRED.

• Please also complete the attached Participation Record for every eligible woman. Use a new sheet each day and record the date. You should then record every woman’s age, eligibility, number of previous pregnancies (parity), normal residence, smoking status and whether or not she agreed to participate. There is also a space for comments if you want to add something, e.g. an explanation of why she chose not to participate. Do not record any names. It is important to record every woman, even if she doesn’t complete the survey, so we can assess the response rate.

• Every eligible woman should be invited every day for two weeks. If a woman has already completed the questionnaire, do not ask her again.

• Questionnaires, participation records and completed consent forms should then be stored securely until returned to the research team. We will arrange for them all to be posted to us at the end of the two weeks.

**Does the research have ethics approval?**

The project has gained approval from the University of Newcastle Human Research Ethics Committee (HREC) (Approval No. H-138-1105) and the Human Research Ethics committee of the NT Department of Health and Families and Menzies School of Health Research HRE # 06/08. These committees have carefully examined the project for its treatment of participants and have ensured that all necessary considerations have been made.
Who are the researchers?

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Rob Sanson-Fisher</td>
<td>Faculty of Health University of Newcastle</td>
<td>02 49 236 169</td>
</tr>
<tr>
<td>Prof Sandra Eades</td>
<td>The Sax Institute</td>
<td>02 9382 7648</td>
</tr>
<tr>
<td>Dr Megan Passey</td>
<td>Faculty of Health University of Newcastle</td>
<td>02 6620 7570</td>
</tr>
<tr>
<td>Prof Shane Houston</td>
<td>Department of Health and Families, NT</td>
<td>08 8999 2993</td>
</tr>
</tbody>
</table>

If you have any concerns or complaints you can contact the Secretary, Human Research Ethics committee of the NT Department of Health and Families and Menzies School of Health Research on 08 89227977 or email ethics@menzies.edu.au.

Yours Sincerely

Laureate Professor Rob Sanson-Fisher
5.7 Women's Information Sheet
Women’s Information Sheet for Health issues during pregnancy

Researchers from the University of Newcastle are working with the Department of Health and Families, and we need your help.

We would like you to help us by completing a questionnaire

This is for you to keep.

Why is this study being done?

- We are interested in exploring your views about smoking and alcohol consumption during pregnancy.
- We want to find out what would help pregnant Aboriginal women quit smoking, so we can create a quitting program that works.

Who can take part?

- We are inviting Aboriginal or Torres Strait Islander women aged 16 years and over who attend any participating health service for healthcare during pregnancy to take part.

What are we asking you to do?

- If you agree to take part, you will be asked to complete a questionnaire, which asks about your lifestyle, your smoking and alcohol consumption, your pregnancy and your family.
- If you like, a health worker will assist you with completing the questions.

What choices do I have?

- You do not have to take part in the research project if you do not want to. It is up to you if you do the survey.
- You don’t have to answer any questions that you are uncomfortable with.
- You can withdraw at any time.
- If you don’t want to join it is entirely up to you. It will not affect your access to the best available treatment and care.
What are the risks and benefits?
- There are no immediate benefits for taking part in this research. However, the information collected will be used to develop a program to help pregnant women quit smoking.
- There are no risks associated with taking part in this study.

How will privacy be protected?
- All information collected will be anonymous.
- The survey will not have your name on it or any other identifying information.
- All forms will be stored securely and only the research team will have access.

How will information collected be used?
- All information collected in this study will be handled with respect.
- Data will be coded and stored securely at the University of Newcastle.
- Data will only be accessed by the research team.
- Information about specific persons will not be revealed in any research reports arising from this project.
- The information from the study may be reported in a scientific journal, which will be available to the public.
- The full research reports, as well as a short summary of results, will be available through your Health Service at the end of the study.

What do you need to do to participate?
- Please read this information statement and make sure you understand it before you consent to participate.
- If there is anything you don’t understand or you have questions please ask the Health Worker.
- If you would like to participate, please complete the questionnaire and return it during your consultation or to the front desk of the clinic.

Would you like more information?
- You can keep this information statement.
- If you would like more information, you can contact any of the researchers listed below.

Who are the researchers?

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof Rob Sanson-Fisher</td>
<td>Faculty of Health, University of Newcastle</td>
<td>02 49 236 169</td>
</tr>
<tr>
<td>Prof Sandra Eades</td>
<td>The Sax Institute</td>
<td>02 9382 7648</td>
</tr>
<tr>
<td>Dr Megan Passey (PhD student)</td>
<td>Faculty of Health, University of Newcastle</td>
<td>02 6620 7570</td>
</tr>
<tr>
<td>Prof Shane Houston</td>
<td>Department of Health and Community Services</td>
<td>08 8999 2993</td>
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</tbody>
</table>
Complaints about the research
This project has been approved by the University of Newcastle Human Research Ethics Committee Approval # H-138-1105 and the Human Research Ethics committee of the NT Department of Health and community Services and Menzies School of Health Research HRE # 06/08.

If you have any concerns or complaints about the ethical conduct of this study, you can contact the Secretary, Human Research Ethics Committee of the Department of Health and Families and Menzies School of Health Research, telephone 08 89227922 or email ethics@menzies.edu.au

We thank you for considering taking part in this project.
5.8 Women’s consent form
**Consent form**

Exploring the knowledge and attitudes of Aboriginal service staff and antenatal clients regarding smoking and alcohol consumption during pregnancy

**Participant Consent Form**

Rob Sanson-Fisher  
Professor of Health Behaviour  
Room 267, David Maddison Building  
Ph 02 49236169  
Fax 02 49236779

I agree to take part in the above research project and give my consent freely.  
I understand that the project will be conducted as described in the Information Statement, a copy of which I have retained.  
I understand that I can withdraw from the project at any time and do not have to give a reason for withdrawing.  
I understand that my personal information will remain confidential to the researchers.  
I have the opportunity to have questions answered to my satisfaction.  
I consent to answer questions relating to my smoking history, alcohol consumption and my pregnancy.

Name:________________________ Signature_____________________ Date__/__/__

<table>
<thead>
<tr>
<th>Name</th>
<th>Contact Information</th>
</tr>
</thead>
</table>
| Prof Rob Sanson-Fisher| Faculty of Health  
University of Newcastle  
Ph: 02 4923 6169 |
| Prof Sandra Eades     | Sax Institute  
Ph: 02 9382 7648 |
| Prof Shane Houston    | Department of Health and Families  
Ph: 08 8999 2993 |
| Dr Megan Passey       | Faculty of Health University of Newcastle  
Ph: 02 6620 7570 |
5.9 Women’s questionnaire
Health Issues During Pregnancy

This questionnaire is for pregnant Aboriginal and Torres Strait Islander women only.

The information from this survey will be used to develop a quitting program to help women quit smoking and drinking during their pregnancy.

Please answer all the questions honestly and frankly, as correct information is essential in developing an effective and realistic intervention.

We will not pass on your information to anyone else.

The Researchers

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Phone</th>
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<tbody>
<tr>
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<td>Department of Health and Families, NT</td>
<td>08 8999 2993</td>
</tr>
</tbody>
</table>

Please Note: We use the term Aboriginal to refer to both Aboriginal and Torres Strait Islander peoples.
About You

Q1. How old are you? [ ]

Q2. What was the highest year you completed at school?
   - 5 [ ]
   - 6 [ ]
   - 7 [ ]
   - 8 [ ]
   - 9 [ ]
   - 10 [ ]
   - 11 [ ]
   - 12 [ ]

Q3. Have you done any courses at TAFE, Batchelor Institute of Indigenous Tertiary Education or University?
   - Yes [ ]
   - No [ ]

Q4. What is the name of the community where you usually live? ________________________________

Q5. How many weeks pregnant are you? [ ]

Q6. How many children have you given birth to? [ ]

Q7. How many times have you seen a doctor this pregnancy? [ ]

Q8. How many times have you seen the midwife/nurse or health worker this pregnancy? [ ]

Q9. Was this a planned pregnancy or did it just happen?
   - Planned [ ]
   - It just happened [ ]

About You and Tobacco

Q10. Which of the following describes you best?
   - I smoke every day [ ]
   - I smoke occasionally (not every day) [ ]
   - I'm an ex-smoker; I never smoke now [ ]
   - I have never smoked [ ]

If you have never smoked cigarettes, please go straight to Q18 ON THE NEXT PAGE.
If you smoke cigarettes now, or used to smoke cigarettes, please answer Q11 to Q17 first.

Q11. Have you had a cigarette in the last 7 days (even a puff)?
   - Yes [ ]
   - No [ ]

Q12. Have you changed your level of smoking since you found out you were pregnant?
   PLEASE COLOUR THE BEST RESPONSE
   - Increased a lot [ ]
   - Increased a little [ ]
   - Stayed the same [ ]
   - Decreased a little [ ]
   - Decreased a lot [ ]
   - Quit completely [ ]
   - I quit before I got pregnant [ ]

Q13. How old were you when you first started smoking? [ ]

Q14. Thinking back to when you started smoking, was it easy for children to buy cigarettes?
   - Yes [ ]
   - No [ ]

Q15. Have children ever told you that you shouldn't smoke?
   - Yes [ ]
   - No [ ]

Q16. If you are a smoker, how many cigarettes do you usually smoke each day?
   - [ ]
   - I am not a smoker [ ]
Q18. Has your doctor, health worker or midwife asked you whether you smoke tobacco in this pregnancy?
- Yes
- No
- I don't remember

Q19. If you are a smoker, did they advise you to quit smoking during the pregnancy?
- Yes
- No
- I don't remember
- I'm not a smoker

Q20. If you are a smoker, did they offer to support you to quit smoking during the pregnancy?
- Yes
- No
- I don't remember
- I'm not a smoker

Q21. Please indicate how useful you think each of the following would be in helping pregnant Aboriginal women quit smoking:

**PLEASE COLOUR THE BEST RESPONSE IN EACH ROW**

<table>
<thead>
<tr>
<th>A) Provision of free nicotine replacement therapy (patches or gum)</th>
<th>Very helpful</th>
<th>Somewhat helpful</th>
<th>Maybe helpful</th>
<th>Not helpful</th>
<th>Harmful</th>
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</thead>
<tbody>
<tr>
<td>B) Advice and support from the midwife</td>
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<tr>
<td>C) Advice and support from the health worker</td>
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<tr>
<td>D) Advice and support from the doctor</td>
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<td>E) Support for the whole family to help others quit</td>
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<td>F) Stress management programs</td>
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<td>G) Support groups (with other women quitting)</td>
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<tr>
<td>H) Support person (a non-smoker to help them through it)</td>
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<tr>
<td>I) Community activities about quitting</td>
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<td>J) Brochures about the harms of smoking with advice on how to quit</td>
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<tr>
<td>K) Rewards for women who stop smoking with vouchers to get things for the mother or baby. There would be testing to make sure the woman has quit.</td>
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<tr>
<td>L) Access to a telephone Quitline</td>
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</tbody>
</table>

Q17b. What caused you to quit smoking? (select as many as you want)
- Pregnancy
- Children in the house with asthma
- Health scare
- Sick relatives in the house
- Cost of cigarettes
- Television
- Children telling me to
- Health warnings on packets
- Advice from health staff
- Smoking restrictions in public places
- Family or friends asked me to
- Other

Q17a. In what year did you stop smoking?

Question 17 is for ex-smokers only

The Next Set of Questions is for Everyone
The Rest of the Questions are for Everyone

Please select the best response

Q25. Has your doctor, health worker or midwife asked you whether you drink alcohol in this pregnancy?
- Yes
- No
- I don’t remember

Q26. If you do drink alcohol, did they advise you to quit drinking during the pregnancy?
- Yes
- No
- I don’t remember
- I’m not a drinker

Q27. If you do drink alcohol, did they offer to support you to quit drinking during the pregnancy?
- Yes
- No
- I don’t remember
- I’m not a smoker

About You and Gunja (also called cannabis, dope or yarndi)

Q28. Colour the circle for the response that best describes you.
- I smoke gunja every day
- I smoke gunja occasionally (not every day)
- I’m an ex-gunja smoker; I never smoke gunja now
- I have never smoked gunja

Q29. Have you smoked gunja in the last 7 days (even a puff)?
- Yes
- No

Q30. Have you changed your habit of smoking gunja since you found out you were pregnant?
- Increased a lot
- Increased a little
- Stayed the same
- Decreased a little
- Decreased a lot
- Quit completely
- I quit before I got pregnant

Q31. How old were you when you first started smoking gunja?

Q32. If you are a gunja smoker, how many cones or joints do you usually smoke each day?
- I am not a gunja smoker

About You and Alcohol

Q22. In the last month, how often have you had a drink containing alcohol?
- Never
- Only once
- 2 to 4 times in the month
- 2 to 3 times a week
- 4 or more times a week

If you have never drunk alcohol, please go straight to Q25 OVER THE PAGE.
If you drink alcohol now, or used to drink alcohol, please answer Q23 and Q24 first.

Q23. Have you changed your level of drinking since you found out you were pregnant?
- Increased a lot
- Increased a little
- Stayed the same
- Decreased a little
- Decreased a lot
- Quit completely
- I quit before I got pregnant

Q24. How old were you when you first started drinking?

If you have never smoked gunja, please go straight to Q33 OVER THE PAGE.
If you smoke gunja now, or used to smoke gunja, please answer Q29 to Q32 first

Q30. Have you changed your habit of smoking gunja since you found out you were pregnant?
- Increased a lot
- Increased a little
- Stayed the same
- Decreased a little
- Decreased a lot
- Quit completely
- I quit before I got pregnant

Q31. How old were you when you first started smoking gunja?

Q32. If you are a gunja smoker, how many cones or joints do you usually smoke each day?
- I am not a gunja smoker
### Ideas about Pregnancy

Q33. Do you agree or disagree with these ideas about pregnancy?

<table>
<thead>
<tr>
<th>Idea</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) It's good to have a smaller baby.</td>
<td></td>
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<tr>
<td>B) My baby is likely to be born healthy.</td>
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<tr>
<td>C) Light smoking does not cause harm to unborn babies.</td>
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<tr>
<td>D) Stopping smoking increases the chance of having a healthy baby.</td>
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<tr>
<td>E) If you are around a lot of smoke from other people you might as well keep smoking yourself.</td>
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<tr>
<td>F) It's OK to drink alcohol when you're pregnant as long as you don't drink a lot.</td>
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<tr>
<td>G) Quitting smoking is just too hard. It's not worth the effort.</td>
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<tr>
<td>H) Gunja is OK when you're pregnant because it's natural.</td>
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<tr>
<td>I) It's harder to quit smoking during pregnancy because of all the worries.</td>
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<tr>
<td>J) You've got to die of something so why give up the things you enjoy.</td>
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<tr>
<td>K) Women will try to give up smoking and drinking for their children even if they won't try for themselves.</td>
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<tr>
<td>L) In our community it's OK to smoke when you are pregnant.</td>
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<tr>
<td>M) Most women have bigger problems to deal with than trying to quit smoking and drinking.</td>
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<tr>
<td>N) Health care providers should tell pregnant women to quit smoking tobacco.</td>
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<tr>
<td>O) Health care providers should tell pregnant women to quit using alcohol and drugs.</td>
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</tbody>
</table>

Please indicate if you agree or disagree with these ideas

Q34. Smoking tobacco during pregnancy increases the chances of:

<table>
<thead>
<tr>
<th>Effect</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) miscarriage (losing the baby)</td>
<td></td>
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<tr>
<td>B) low birth weight of baby</td>
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<tr>
<td>C) breathing problems and sickness in infant</td>
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<tr>
<td>D) mother having high blood pressure and increased heart rate</td>
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<tr>
<td>E) behavioural problems in childhood</td>
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</table>

Q35. Drinking alcohol during pregnancy increases the chances of:

<table>
<thead>
<tr>
<th>Effect</th>
<th>Agree</th>
<th>Disagree</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) miscarriage (losing the baby)</td>
<td></td>
<td></td>
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<tr>
<td>B) birth defects (baby not developing normally)</td>
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<tr>
<td>C) blocked arteries</td>
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<tr>
<td>D) diabetes in the mother</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>E) behavioural problems in childhood</td>
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<td></td>
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</tbody>
</table>
Q36. Are you aware that there is a free Quitline service that you can ring?
○ Yes  ○ No

Please colour the best response

Q37. In a typical week, how often do you watch TV?
○ Every day  ○ 4-6 days per week  ○ 1-3 days per week  ○ Less than once a week  ○ Never

Q38. How often do you go inside places where smoking is banned? (e.g. cafes, schools, public transport)
○ Every day  ○ 4-6 days per week  ○ 1-3 days per week  ○ Less than once a week  ○ Never

Q39. Do you have a telephone that you can use (you can mark more than one type of phone if you wish)?
○ Yes, a mobile phone  ○ Yes, a landline  ○ No, I don't have a phone I can use

Q40. Did anyone help you complete this questionnaire?
○ Yes  ○ No

Q41. Please fill in today's date:  /  /  For example 30/06/08

THANK YOU FOR HELPING US
WE APPRECIATE YOUR TIME AND EFFORT
5.10 Participation log for women
Women’s Participation Record

Health issues during pregnancy study

Please remember to record every eligible woman you see, even if she doesn’t complete a survey

Date: ...... / ...... / ....... morning / afternoon (circle)

Eligibility criteria:
- 16 years or over,
- Not being treated for any mental illness or drug dependency other than tobacco or alcohol

<table>
<thead>
<tr>
<th>Age</th>
<th>Eligible? (Yes / No)</th>
<th>Number of previous pregnancies</th>
<th>Normal residence: Urban/ Rural/ Remote?</th>
<th>Smokes? (Yes / No)</th>
<th>Agreed to participate? (Yes / No)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
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Appendix 6
### 6.1 Additional table for Paper 7

**Additional table for Paper 7**: How will we close the gap in smoking rates for pregnant Indigenous women? Summary of interventions meeting inclusion criteria

<table>
<thead>
<tr>
<th>Reference</th>
<th>Country; Design; Setting</th>
<th>Sample</th>
<th>Components of Intervention</th>
<th>Control</th>
<th>Primary outcome measures; Follow-up time points</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patten (2010)</td>
<td>USA, Y-K Delta region of Western Alaska RCT, not blinded</td>
<td>Single-centre study, community participants</td>
<td><strong>Eligibility</strong>: ≥18 years; ≤24 weeks gestation; self-reported smoking or Iqmik/smokeless tobacco in previous 7 days; planning to quit in next 30 days; access to a VCR/DVD player and telephone</td>
<td><strong>Intervention</strong>: Face-to-face counselling at the first visit (15-25 minutes prior to the video, then 10-15 minutes after the video); a video highlighting personal stories of Alaska Native women who quit during pregnancy, viewed, then given to women to take home to gain family support; a culturally-specific cessation guide; four telephone calls (15 minutes each) using a culturally-tailored protocol. Adapted from the SCRIPT (Smoking Cessation and Reduction in Pregnancy Treatment) program to be appropriate to Yupik culture. Based on social cognitive theory <strong>Frequency of contact</strong>: Initial visit, then at 1, 2, 4, 6 weeks later <strong>Mode of delivery</strong>: Initial visit face-to-face. Subsequent contact by telephone</td>
<td><strong>Control</strong>: Brief (5 minute) face-to-face counselling using SAs (Ask, Advise, Assess, Assist, Arrange) at the first visit and 4 pregnancy and culturally-specific brochures</td>
<td><strong>Findings</strong>: Reported abstinence confirmed by salivary cotinine; &gt;60 days post-randomisation</td>
</tr>
<tr>
<td>Reference</td>
<td>Country; Design; Setting</td>
<td>Sample</td>
<td>Components of Intervention</td>
<td>Control</td>
<td>Primary outcome measures; Follow-up time points</td>
<td>Findings</td>
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</table>
| Eades (2012) | Australia, Western Australia and Queensland Randomised controlled trial, not blinded. 3 urban Aboriginal Community Controlled Health Services | Eligibility: Indigenous; attending 1st antenatal appointment at participating service; ≤20 weeks gestation; aged ≥16 years; self-reported current smoker or recent quitter (quitting when they knew they were pregnant); local resident; not mentally ill; not receiving treatment for chemical dependencies other than tobacco or alcohol  
Size: n=263  
(control n=148; intervention n=115)  
Ethnicity: Aboriginal and Torres Strait Islander | Intervention: Initial invitation from doctor to quit smoking; quitting advice; encouraged to leave cigarettes behind in clinic; encouraged to sign written agreement to try to quit; resources (written advice on quit strategies; fridge magnet, letter for household members, appointment reminder card); advised to return in 3-5 days  
Frequency of contact: Initial visit then 3-5 days and 7-10 days after initial visit  
Mode of delivery: Face-to-face with telephone and text messages to remind about future appointments  
Care provider: Initially doctor providing antenatal care; then female Indigenous health workers or midwives  
Relapse prevention: If women relapsed, they were encouraged to continue to make quit attempts while pregnant  
Nicotine replacement therapy: Offered if still smoking at 7-10 day visit  
Role of family members: Letter to household members requesting they support the woman in her quit attempt and encouraging them to quit as well; women encouraged to bring a partner or support person to 2nd visit  
Culturally specific content: Yes, but not detailed. | Usual care, which included general advice from their doctors about quitting smoking, based on existing brief intervention guidelines including further support and advice provided by their doctors at scheduled antenatal visits | Self-reported abstinence in previous 7 days confirmed by urinary cotinine; ≥36 weeks gestation | 263 of 379 (69%) eligible women consented, and 176 were followed to 36 weeks  
11 of 98 (11%) women in the intervention group and 4 of 76 (5%) women in the control group were confirmed to have quit at 36 weeks gestation (NS). Intention to treat analysis also NS. |

Key: WIC: Women, Infants and Children Service