# EXPLORING PREDICTORS OF TOBACCO USE DURING PREGNANCY IN NORTHERN BRITISH COLUMBIA: BARRIERS TO CONDUCTING TOBACCO RESEARCH

by

## **Denys M. Smith**

B.Sc. Hons., University of Northern British Columbia, 2004

# THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF SCIENCE IN PSYCHOLOGY

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### Abstract

Living in northern remote regions has implications for smoking rates in pregnancy and for participant recruitment and retention in tobacco research. The purpose of this research was to identify predictors of smoking through pregnancy for women in northern remote areas in BC. Structured telephone interviews were conducted with 12 participants recruited from the region. Questions asked at baseline were reproduced from a triage tool developed in earlier research. Additional questions specific to pregnant women examined community characteristics, transportation, initial impact of pregnancy and transience. Principal outcomes were: smoking status, smoking rate and quit attempt. Recruitment and retention issues resulted in low participant numbers. Results were interpreted with caution and research interests redirected. Possible solutions to problematic design issues were discussed in the final evaluation. The design appeared, in theory, to be reasonable; however, in reality, it was not compatible with unique environmental and cultural factors impacting data collection in the north.

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Exploring Predictors of Tobacco use During Pregnancy in Northern BC: Barriers to Conducting Tobacco Research with Pregnant Women in the North

## Introduction

Interest in the current study was generated while conducting an earlier tobacco cessation research study in northern BC. The earlier study was designed to evaluate the value in smoking cessation of matching smokers to treatment, using a triage tool based upon their level of nicotine dependence, psychosocial resources and stage of readiness to quit smoking. The scope of the study excluded smokers who were pregnant, and as a result, highlighted a population with specific needs who may benefit from specific treatment interventions as defined by the triage tool. As a result, smoking behavior during pregnancy in the northern rural and remote context was identified as a focus for this research. Investigating domains of interest for question development in order to improve the match between smoker characteristics and smoking cessation interventions was the purpose of the study.

Recruitment and retention of study participants emerged as major issues as the study progressed. Anticipated recruitment numbers at participating health care agencies were considerably lower than expected. Management support was not always an indicator of staff promoting the study. Consequently, it became a challenge to achieve the study goals as originally conceived. Nevertheless, the pursuit of the study may have resulted in lessons learned about the process of performing applied behavioral research in contexts that differ substantially from more conventional settings. This thesis can thus be seen as a case study. In describing it, I will articulate the issues that led to its conception and

design, describe the outcome of conventional analyses of the data and then turn to what was learned intentionally and incidentally in its course.

#### **Background Research**

Smoking during and after pregnancy is an ongoing health problem causing harm to the mother and her developing fetus. Smoking results in increased morbidity and mortality from cancers, cardiovascular and pulmonary disease in the mother, and has been implicated in the etiology of abruption placenta, placenta previa, spontaneous abortion, premature delivery, and stillbirth (Meyer, Jonas, & Tonascia, 1976; Naeye, 1979; Ness et al., 1999; Walsh, 1994). Recent findings have confirmed significant immunological effects of smoking on the fetus, resulting in higher rates of respiratory infections, asthma (Noakes, Hale, Thomas, & Devadason, 2006) and cancer (Sheung & Zelikoff, 2006). Results from a study based on 9,000 pregnancies found that maternal smoking also reduced the chances of conceiving a male child, and may have prevented male embryos from implanting in the womb, causing miscarriages (Woolfe, 2007). Some of the harmful effects of smoking, for example, small for gestational age babies, could have been avoided by reducing smoking (Ratatikainen, Huurinainen, & Heinonen, 2007). Smoking less may not always be of benefit to the fetus because smokers may inhale more deeply or more frequently to receive their required amount of nicotine (Physicians for a Smoke Free Canada, 2005).

Although British Columbia has made substantial progress toward the reduction of smoking, that progress has not been evenly distributed around the province. For example, the British Columbia Reproductive Care Guideline (BCRCG, 2006), based on current evidence as it relates to best clinical practices, reported smoking prevalence for the region served by the Northern Health Authority in 2004 to be 18% among pregnant women

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compared to 4.5% among similar young women in the Lower Mainland (BCRCP 2006). Maternal smoking rates of 21% were found in the Northern Interior (location for Prince George) and 14.2% in the North West (location for Terrace and Prince Rupert).

Pregnant women living in northern rural and remote communities of northern British Columbia face unique health and healthcare challenges as a result of the interplay among geographic, political, climatic, and sociocultural issues typical of British Columbia's rural and remote regions (Northern Secretariat, undated). Women's access to health care services can be compromised by factors such as the harsh northern climate, limited transportation options and adverse road conditions. Smoking prevalence for pregnant women was highest among both aboriginal and non-aboriginal women of low socioeconomic status, occupational status and education level. As shown in Figure 1, the Northern Health Authority had higher smoking prevalence rates than the other Health Authorities in BC (BCRCP 2006). A higher proportion of women with lower levels of socioeconomic status, occupational status and education level lived in Northern BC than in other areas of the province (Women North Network / Northern Fire 2007).



*Figure 1*. Maternal Smoking During Pregnancy by Place of Residence for Health Authority and Province.

The domains for looking at predictors of smoking during pregnancy for this research study arose from an understanding of the wide range of background characteristics defining pregnant women who were smoking and living in remote northern regions as informed by pilot investigations conducted in the region. As the study progressed, the northern context revealed barriers to successful recruitment and retention of participants for this population. The following section provides information on the sociocultural profile important for understanding the region in which this series of studies played out.

#### Chapter Two

#### Sociocultural Characteristics of the Region

Sociocultural diversity exists among subpopulations residing in northwest BC (e.g. between Aboriginal residents on and off reserve, and non-Aboriginal residents) and social problems prevalent in the general population (for example, single parenthood, violence in relationships, transient living and smoking partners) exist in greater proportions than in other geographic areas (Women North Network / Northern Fire, 2007). Prince George is located in the northern interior of BC. By comparison with the rest of the region, it is a larger northern urban center with sociocultural characteristics similar to BC's northwestern communities (in terms of rates of single parenthood, violence in relationships, transience and smoking partners), but with a smaller Aboriginal population, more available public transportation, and greater capacity in terms of smoking cessation resources.

*Aboriginal women.* Aboriginal women make up approximately 30% of the female population in Terrace and Prince Rupert and 11% in Prince George (Census Aboriginal Population Profiles, 2001). Issues related to poverty and education are widespread among Aboriginal people and smoking prevalence is higher among aboriginal than non-aboriginal women (CDC PRAMS, 2004). Tobacco related diseases are of great concern in First Nations and Inuit communities where smoking rates are more than twice that of the rest of Canada (Assembly of First Nations, 2006).

*Education.* Lower educational levels exist in northern BC relative to the rest of the province and the country. The percentage of students graduating from high school in Terrace and Prince Rupert (Northwest BC) in 2006/2007 was 67%. In Prince George

(BC's Northern Interior) 75% of students graduated. The provincial average for the same year (2006/2007) was 78%. For aboriginal students, the average percentage of first time grade 12 students who graduated from Terrace and Prince Rupert was 56% (Ministry of Education, 2008).

*Poverty*. The median household income in 2006 was higher than the provincial average in Prince Rupert (\$60,374 versus \$54,840) and Terrace (\$59,939). The socioeconomic division between higher and lower levels of household income in the two communities is exaggerated as a result of the area's economic and ethnic characteristics. For example, workers over represented in seasonal job positions (many of whom are First Nations people) experience lengthy periods of unemployment (L. Cameron, personal communication, Oct 3, 2006). Prince George's median household income was \$53,600 for the same year (Statistics Canada, 2006).

Many single mothers raise children on welfare incomes below the poverty level. A higher number of single mothers was reported for Prince Rupert (20%) than for Terrace (15%). Single mother households in Prince George were estimated at13%. The provincial average was 12% (2006 Sensus Profile, Women North Network / Northern Fire, 2007).

*Transportation*. Access to reliable means of transportation affects quality of life, financial security and freedom of movement. Too often, poor and minority people find themselves unable to secure and maintain employment, or access services and facilities in the community. Studies show that few welfare recipients own cars, and lack of transportation is a critical barrier to finding and keeping employment. People in poor and minority households without their own means of transportation are reliant on public transportation or fragile arrangements with friends and neighbors (Stommes & Brown, 2005).

Service provision and First Nations communities. Political involvement of First Nations communities in the Pacific Northwest has brought about changes in service provision, in program development and in the transfer of health services. Services are delivered in a manner that fit the communities' needs; however, First Nations' jurisdiction for health services is limited to reserve land. Federal and provincial jurisdictional issues present a challenge to the development of effective prevention programs where distinctions between status and non-status, and living on reserve and off reserve fuel an ongoing debate (Sayers & MacDonald, 2001).

#### Needs Assessment

As a preliminary phase of this project, needs assessments were carried out in Terrace, Prince Rupert, and in Prince George (a larger urban center), to determine what issues existed regarding access, availability and utilization of tobacco cessation resources by pregnant smokers. Service access and delivery is impacted by distance from urban centers, by the distance between communities and by differences in funding allocations for subpopulations within communities (De Leeuw, Fiske, & Greenwood, 2002).

Needs assessments conducted in the regions under investigation provided information needed to identify issues around and barriers to cessation success for pregnant smokers in the north. Assessments were conducted with health care professionals, involved in the smoking issue, who work in the regions under investigation. From these investigations, domains of interest were determined, themes (issues) identified as potential barriers to cessation and survey questions developed.

Communities selected for the study were located in the northern interior and in northwest BC. The two communities selected for assessment in northwest BC were chosen for their population size, and for their geographic representation of communities remote by nature of their distance from the nearest urban and metropolitan centers. The community selected in BC's northern interior was chosen for its geographically remote northern location and for variability that may exist in characteristics of interest for this research in the larger urban center.

Background information regarding prenatal services and health professionals providing service in the Terrace, Prince Rupert and Prince George areas was provided by

Tobacco Reduction Coordinators working for the Northern Health Authority in each research area.

*Needs assessment methods.* Methods for determining domains of interest included discussion and open-ended interviews with key informants (health professionals) in the chosen communities. Key informants were obstetrics/gynecology specialists, medical office assistants, prenatal educators, public health nurses, community health nurses, execurtive directors of organizations offering pre-natal services, and Aboriginal service providers from Friendship House Associations. A total of 20 open-ended interviews were conducted using the questionnaire found in Appendix A as a guide. Themes (issues) were extracted from hand written notes taken at these interviews. Ethics approval was obtained. Key informants were assured anonymity and confidentiality and permission obtained where reference to discussion appears in the thesis document.

The original assessment goal was to determine the nature, capacity and characteristics of smoking cessation services available for pregnant women in the three communities. Information was gathered from health care specialists who, because of their professional training and/or affiliation with organizations or agencies providing pre-natal and post partum services to pregnant women were in a prime position to present the needs of the community. At the same time, their interest and involvement in tobacco control was determined. Meetings were arranged with people from the aboriginal communities and any differences in cultural views regarding the issue of tobacco control were determined.

Focus group meetings and meetings with independent specialists were held in First Nations and central community health centers in the three communities. Issues around challenges associated with the delivery of tobacco control interventions in northern BC

were included in the assessment and framed as open-ended questions. Information related to services available, service capacity and service needs unique to sub groups within the community (First Nations pregnant smokers both on and off reserve) was discussed. The specific questions posed addressed the overall effectiveness of services available, what comprised available resources in the area, challenges to successful cessation, issues of geographic isolation and cultural specificity, whether "best practices" were being followed and unmet needs of smokers (see Appendix A).

The completed needs assessment identifies cultural, structural and social issues impacting changes in women's smoking behavior in the areas under investigation. Issues raised by health care specialists were pursued with caution and limitations in terms of looking at problem issues from the level of the individual rather than at the population level were acknowledged. Current literature examining the same issues from a population perspective was reviewed and information incorporated into the assessment design. Reference was made to community research conducted by DNieto, Shaffner and Henderson (1997) for feedback on issues and question topics to be considered in the assessment.

## Themes Issues Arising from the Needs Assessment.

1. Structural and cultural factors specific to pregnant women in northern remote areas of British Columbia may be responsible for elevated smoking rates for this population. Prevalence rates for pregnant women in northern BC were higher than the provincial average. It was suggested that successful smoking cessation, cessation maintenance and relapse prevention rates could have been improved by developing interventions that addressed the influence of structural factors (i.e. poverty, education

level, social support, co morbid conditions) and cultural factors (i.e. high prevalence rates in First Nations communities) related to pregnancy in the north; for example, by increasing support for the quit attempt. The issue of social support was particularly salient. Barriers to developing useful social support strategies for pregnant smokers in northern areas were related by health professionals to cultural and economic factors. Barriers of concern included transient living, single parenthood and violence in relationships (L. Cameron and C. Tanski, personal communication Oct 2<sup>nd</sup> 2006).

2. Smokers relocating during a cessation intervention were seen as less likely to have a successful cessation attempt than smokers who did not experience the same type of interruption. Transient living was seen as affecting the continuity and effectiveness of social support as an aid to cessation from the perspective of both the resource and the commodity model of support. Peer support may represent a practical example of the commodity model where friends support each other in a quit attempt and develop rules to unite their quit attempt. The effectiveness is lost when the support is not accessible. Services providers endorse the flexibility and support found with a resource model of cessation where support is provided by validating the "quitters" feelings without taking control (Fisher, 1997). Successful cessation is more likely with undisturbed access to a chosen cessation resource.

Researchers Heaman and Chalmers (2005) examined the impact of transience on the prevalence and correlates of smoking between Aboriginal and non-Aboriginal women in Manitoba and found that non-Aboriginal women who reported smoking during pregnancy moved more frequently than women who discontinued smoking during pregnancy. In their study, transience was not significantly associated with smoking during pregnancy

for Aboriginal women. In the present needs assessment, transitional living arrangements were viewed as unavoidable for some young families in Northern BC. Health care providers often experienced difficulty maintaining telephone contact with clients and service disruption was commonplace. Transportation for many residents was not consistently available, making centralized services less accessible (L. Cameron, personal communication, October 2, 2006).

3. The positive impact of social support was also identified in the suggestion that frequent follow-up for people throughout quit smoking interventions would lessen the possibility of attrition through loss of contact. Likewise, pregnancy outreach programs (community support services for women throughout pregnancy and postpartum) appeared to provide a sense of community for many young women during pregnancy and a reliable point of contact for making and receiving phone calls. Aboriginal and non-Aboriginal women received counseling and additional living support from peers and facilitators at community Friendship Centers. Facilitators in those centers reported consistent attendance for many women throughout the pre natal and postnatal periods (Leona Perdon, personal communication Oct  $3^{rd}$  2006).

4. The concept of social support also extended to the interactive behavior between smoking partners. Health behaviors of women who are single parents are less likely to be influenced by the thoughts of others than health behaviors of those living with a partner (Bottorf, Kalaw, Johnson, Stewart, Greaves, & Carey 2006).

Women who have accommodating interaction tobacco use patterns with a partner often share the attempt to reduce or quit smoking, thereby increasing the chance of success. Alternatively women may experience conflictual or disengaged interactions with their

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partners and may need support from elsewhere to maintain health and a sense of wellbeing. Tobacco Related Interaction Patterns (TRIP's) are habits and routines about smoking that take place between couples and are created over time. According to this concept, the dynamics of partner smoking routines change as a result of pregnant women feeling compelled to quit or reduce their tobacco use as a consequence of interactions with their partners. The intensity of the changes to couples' smoking routines taking place during pregnancy varies according to smoking interaction patterns (disengaged, conflictual or accommodating) already established (Bottorf et al., 2006).

5. High levels of physical, emotional and sexual violence are issues for some women in northern BC and need to be addressed before other health issues such as smoking cessation (Suzanne Miskelly, personal communication, Oct 2<sup>nd</sup> 2006). Violence issues and poverty (low SES) were identified as determinants of high stress levels. Successful smoking cessation may be dependent upon incorporating stress coping mechanisms into cessation interventions.

6. High smoking rates were identified for pregnant women where poverty was present (Dr. Amos, D. Bond, personal communication, Oct  $2^{nd} \& 3^{rd}$ , 2006). Women of low socioeconomic status (SES) were seen as over represented in northwest BC. Smoking rates were found to be higher for women of low SES than for women of higher SES in the general population (Crittenden, Manfredi, Cho, & Doleck, 2006). For many low SES pregnant smokers, coping with stress was seen as ongoing and smoking frequently identified as a coping mechanism. Conversation with respondents indicated that low SES smokers appeared to incur a greater number and higher degree of daily stressors than

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women of higher SES living in the same area. Stress was identified as a significant barrier to quitting (Dr. Amos, D. Bond, personal communication, Oct 2<sup>nd</sup> and 3<sup>rd</sup>, 2006)

7. Recent data indicates that the rate of smoking for First Nations adults in Canada (59%) is three times the rate of the general population (First Nations Centre, 2005). Smoking rates for Inuit adults are even higher at 70% (First Nations and Inuit Health Committee, Canadian Pediatric Society, 2006). Personal conversation with respondents indicated that smoking was commonplace by family members and friends within the pregnant aboriginal smokers' immediate environment. Respondents noted that smoking was permitted in community centers (e.g. bingo halls) in some aboriginal communities and that tobacco was available on reserve and often at a lower cost than at outlets off reserve. The cultural use of tobacco (e.g. smoke feasts after death) and the influence of elders that smoke within aboriginal communities may impact commercial tobacco use among community members (C. Tanski, personal communication, Oct 2<sup>nd</sup>, 2006).

8. Respondents felt that women living in remote areas received less support from health professionals than women living in more highly populated settings. A small percentage of women were seen at a formal medical center only once during the pregnancy by their MD. Standard practices for pre-natal care are viewed as compromised under these circumstances (Dr. L. Almos, personal communication, Oct 2<sup>nd</sup>, 2006).

### Chapter Four

## Related Research and Survey Development Carried out in Northern BC

A research project (McDonald & Smith, 2003) focused on the development of a triage tool designed to match smokers to treatment condition (McDonald, Prkachin, Koehn, Filsinger, Smith, et al., 2006) provided the framework and research opportunity for this study. The concept of triage as practiced in preventative health care and related treatment interventions is twofold. From the perspective of smoking cessation interventions, the intent is to provide effective treatment and at the same time avoid over or under prescribing treatment. In the course of the aforementioned study, treatment for smokers attempting to quit was prescribed according to a level determined by the triage tool. From this perspective, triage can be an efficacious health care treatment delivery option in terms of the allocation of health care dollars (McDonald et al., 2006).

Research activities leading to development of the original triage tool spanned two phases. The objective for phase 1 was to establish which variables/characteristics had the potential to identify various types of suitable cessation treatment and consistently predict cessation outcome. Potential algorithm questions from a variety of domains, including level of nicotine dependence, self efficacy for quitting, self perceived stress, co-morbid conditions, social support for quitting and treatment efficacy were tested for validity and test retest reliability before being incorporated into a final tool (McDonald & Smith, 2003).

Experience in the conduct of this study highlighted the issue that the triage tool was designed primarily for urban Canadian and western populations, and suggested that the particular characteristics of the region of northern British Columbia, justified an

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exploration to expand utility of the tool. In particular, there appeared to be a need to adapt its properties to the characteristics of a rural and remote population and the needs of pregnant smokers. Changes and additions made to the existing triage tool designed to match smokers to treatment could address issues specific to this population, maintain the cost effectiveness of the triage tool and improve smoking cessation rates during the critical pregnancy and postpartum period for both mother and child.

Work in the investigation of pregnant women in northern remote BC followed steps outlined in phase 1. The goal was to identify variables from domains specific to pregnant smokers in the north and test them with the target population to determine if they helped predict quitting/outcome. Variables included in the original triage tool were tested against gold standards for each domain (e.g. nicotine dependence and the Fagerstrom scale for nicotine dependence) where reviews showed that the variable accurately predicted cessation five out of six times (McDonald et al., 2006). Relevant variables from the original tool were tested in the current study. The original tool contained questions with reliable psychometric properties with which to measure outcome predictors for a population of Canadian smokers. Evidence from various fields of research showed that particular variables were salient to pregnant women in rural remote areas (De-Leeuw et al., 2002). My purpose was to examine these variables and to identify whether they could provide an increase in the ability to predict cessation success for pregnant smokers in the north (over and above the ability of standard variables incorporated in the existing triage tool to predict cessation success for the general population). Reliability testing of significant predictive variables was identified as a next step for future research. Findings

from follow-up research were intended to inform the triage tool regarding additional variables that would act as reliable predictors for this target population.

McDonald et al. (2006) studied male and female smokers at least19 years of age in northern BC. Communities involved in the study had similar geographic characteristics to the communities targeted in the current study. Utility of the matching algorithm (matching smokers to levels and types of treatment for smoking cessation appropriate to their background) for special populations was unknown; however, findings from the original study indicated that: -

- More people participated in treatment when triaged
- People tended to use less intensive counseling when triaged
- Pharmacotherapy was endorsed by most smokers wanting to quit
- People used fewer intense (and expensive) treatments when triaged
- People used fewer combinations of treatments when triaged
- Fewer people used non-effective treatments when triaged
- Triage may have increased user satisfaction
- Treatment costs for smokers referred by the algorithm were lower than the cost of smokers randomly accessing community resources (McDonald et. al., 2006).

*Follow-up survey development.* Follow-up timing for the current study was determined following a review of recent research. Follow-up survey timing for the validation study conducted in BC by McDonald et al. (2006) reflected evidence-based findings recommending a minimum of six months follow-up to evaluate prolonged abstinence for smoking cessation trials. Criteria used to evaluate earlier cessation trials

with shorter follow-up periods have been found to lack the rigor required to accurately determine estimates of the effectiveness of cessation interventions. Studies using a short period of cessation abstinence to measure success (i.e. a follow-up period of three months or less) instead of a longer period of prolonged abstinence include as successes a large number of people who relapsed and made another quit attempt. Including these participants inflates the estimate of the intervention effect in relation to long-term cessation success (Pierce & Gilpin, 2003).

Two options were considered with respect to follow-up periods for the current study. The first was to use a standard time of six months from recruitment to follow-up. Using a standard measure of six months was potentially problematic for two reasons. First, smokers would be recruited to the study at various stages in the first and second trimesters of their pregnancy and the follow-up timing could have exceeded 40 weeks (duration of a full term pregnancy). Second, the number of eligible participants in remote areas was limited; therefore, eligibility criteria needed to be broader in terms of stage of pregnancy for recruitment. The second option was to recruit participants as early as possible in their pregnancy, schedule follow-up dates for the first day of the third trimester for each participant and control for differences in follow-up time in the final analysis. The relapse curve for long-term cessation showed the lowest success rates for smokers assessed between one and three months into their cessation attempt at baseline (Pierce & Gilpin, 2002). Fifty percent of smokers assessed were found to be smoking after 18 months. For smokers who had been abstinent for between three and six months at baseline, 25 per cent were considered smokers after 18 months.

Assessing smoking status at 28 weeks of pregnancy (third trimester) would have allowed sufficient time from baseline data collection to follow-up (between five and six months) to provide a 'best case scenario' approximation of smoking status through to the final stages of pregnancy. Low recruitment numbers resulted in enrollment at any stage of pregnancy and follow-up for all participants two months from baseline data collection.

## Research Purpose

The purpose of this research was to consider new domains from which to identify variables predictive of the success of smoking cessation specific to the population of pregnant smokers in northern remote areas in BC additional to variables that act as predictors for smokers from the general population. The intention for future research was to validate survey questions from domains predictive of smoking status at follow-up by looking at the differential impact of the variable dependent upon the intervention used. Questions found to be valid and reliable would be added to the existing smoking cessation algorithm designed to match smokers to treatment condition (McDonald et al., 2006). The ultimate goal of the program of research was to provide health professionals with a triage tool useful for matching pregnant smokers to effective treatment interventions and thereby support the development and implementation of effective smoking cessation procedures for pregnant smokers in this region.

*Hypothesis.* It was expected that adding items to a questionnaire that addressed domains specific to smoking among pregnant women in remote areas of Northern BC would increase the ability of the original questionnaire to predict smoking cessation outcomes for pregnant smokers in the north.

## Methods

#### Chapter Six

## **Participants**

Participants were pregnant women attending medical offices, health units, First Nations health care offices on and off reserve, and medical appointments with community outreach nurses in the Terrace, Prince Rupert and Prince George areas. Participants were at least 19 years of age and current smokers. Prenatal health professionals at each site recommended participation in the study to between 30 and 35 pregnant smokers at any stage in their pregnancy and provided them with a leaflet containing information about the study. Eligible participants described themselves as current smokers who have smoked at least 100 cigarettes in their lifetime, or as recent quitters (i.e. who have quit smoking within the last week). Health professionals requested permission from participants to submit their contact information to the research study manager. Participants were asked to sign a standard release of information form conforming to Northern Health protocol. Ethics approval was obtained from the Research Ethics Board at the University of Northern British Columbia and the Research Ethics Board at the Northern Health Authority.

Participants answered questions designed to assess eligibility into the study. Eligible participants were then asked to provide informed consent before proceeding with the Baseline Survey. Participant anonymity was addressed by removing all identifying information from electronic files after the final analysis. Access to data was restricted to members of the research team.

Participants recruited to the study were contacted to complete a baseline telephone survey. The survey assessed items included in the original smoking triage technique and new items. Participants completed a follow up survey two months from the date of baseline survey completion.

### Measures

Predictor variables. Appendix B contains the interview script from which predictor variables were generated. The interview script assessed the following variables:

- 1. Smoking status and use of tobacco products
- 2. Smoking history
- 3. Current smoking rate
- 3. Smoking stage of change
- 4. Nicotine dependence
- 5. Quitting behavior
- 6. Demographics (employment status, education, marital status)
- 7. First Nations status
- 8. Community characteristics
- 9. Transportation access
- 10. Psychosocial resources and stress
- 11. Initial impact of pregnancy
- 12. Transience

Items in categories 1, 2, 3, 4, 5, 7, 11 and 12 represent questions included in the original work on the triage system. New items addressing the needs of the target population and arising from the needs assessment are found in categories 6, 8, 9, 11 and 12.

Nicotine dependency issues addressed in category four included participant scores on the Modified Fagerstrom Test of Nicotine Dependence. Psychosocial issues addressed in category 10 included participant's level of stress, presence/absence of help with the quit attempt from a support person and the participant's relationship with the support person. *Outcomes* 

Smoking outcome was assessed by telephone survey. Information requested included current smoking status, smoking rate, indications of nicotine addiction, cessation attempts and resources used to support cessation. Items can be found in Appendix C.

## Procedure

Eligible participants were contacted by an interviewer working from baseline and follow-up scripts outlined in Appendices A and B. Baseline information was collected and participants were followed up two months later to determine smoking status and properties of their smoking behavior. Data for both baseline and follow-up surveys were entered using the Sensus software system. Participants were called for follow-up up to eight times over a seven to ten day period after which time they were classified as lost to follow-up.

### Design

This was originally intended to be a prospective cohort study in which variables assessed at baseline were assessed according to their ability to predict aspects of smoking behavior at the start date of the third trimester of pregnancy.

I estimated that a sample of 60 - 70 pregnant women who were smokers would be sufficient to conduct analysis on the start date of the third trimester with six independent variables of interest (demographics, initial impact of pregnancy, tobacco issues for Aboriginal people, social support and stress, transience and transportation). Ten cases were required for each variable. Each of the variables represented a unidimensional scale on which participants would receive a score.

## Incentive

Participants completing the follow-up survey were provided with a gift basket for mother and baby containing items valued at approximately 20 dollars.

#### Results

#### Chapter Seven

## Recruitment

Recruitment of study participants began on November 5<sup>th</sup>, 2008, with plans to recruit 70 smokers using Sensus web survey software. Recruitment was scheduled to run for 12 weeks ending in February 2009; however, recruitment numbers were lower than anticipated. Many of the participants initially contacted were either difficult to reach or were beyond 20 weeks in their pregnancy. Recruitment was extended to the end of March 2009 and participants beyond 20 weeks gestation originally considered ineligible were called a second time and invited to participate. Follow-up data collection originally scheduled to take place on the first day of the third trimester for each participant took place after two months due to the diminished recruitment effectiveness. Follow-up surveys for two participants were completed following the birth of their child. A total of 27 participants from Northern BC (Prince Rupert, Terrace, Hartley Bay, Fort St. John and Prince George) were initially enrolled in the study. Twelve of the 27 participants who completed the baseline survey were available to complete the follow-up. Eight follow-up calls were made over a one-week period after which participants who could not be reached were considered lost to follow-up. Three participants had moved from their original residence, two requested return calls after which there was no answer and for the remaining ten there was no answer. Most participants were using cell phones, making the distinction between no answer, moved, and phone out of service difficult to determine. A summary of recruitment and attrition is presented in Figure 2.



Figure 2. Summary of Recruitment and Attrition.

Participants recruited were 19 years of age or older. The average age was 26 years SD = 5.46. Demographic characteristics of participants recruited are provided in Table 1 below.

Education	Some high school	Complete high school	Trade school college	Some, or complete university	
Number	11	11	4	1	
%	40.7	40.7	14.8	3.7	
Employed	Yes	No			
Number	4	23			
%	14.8	85.2			
Marital status	Married common-law	Separated	Widowed	Divorced	Sin
Number	19	0	0	0	8
%	70.4	0	0	0	29.
Distance from	0-5	6-10	11-20	>20	

Table 1. Demographic Characteristics of Recruited Participants

Marital status	Married common-law	Separated	Widowed	Divorced	Single
Number	19	0	0	0	8
%	70.4	0	0	0	29.6
Distance from town center (km)	0-5	6-10	11-20	>20	
Number	17	8	1	1	
%	62.9	29.6	3.7	3.7	
Aboriginal	Yes	No			
Number	15	12			
%	55.6	44.4			

Demographic information contained in Table1 identifies characteristics of the sample according to age, education, employment, marital status and Aboriginal status. A range of 18 years exists in the age of participants. The modal age (four participants) was 22 years and the mean age 26. Numbers of high school graduates and participants who partly completed high school were identical. Four had completed some community college courses. Most participants were living in a "marriage" type relationship (22) and eight participants were single. Over half of the sample was First Nations women (15), 12 participants identified themselves as Caucasian and other ethnic groups were not represented.

Table 1 also provides a breakdown of the distance participants lived from the town center in the five study locations. Fifteen Aboriginal participants were interviewed and asked if they had access to a vehicle on a daily basis. Eleven reported no, two reported yes and two reported sometimes. Table 2 characterizes the sample in terms of stage of pregnancy and how pregnancy related to participants' smoking behavior.
Trimester of pregnancy	First	Second	Third		
Number %	9 33.3	7 25.9	11 40.7		
Change in Smoking	Stopped before	Stopped after	Cut down	Smoke same	Smoke more
Number %	1 3.7	15 55.6	8 29. 6	1 3.7	2 7.4
First full-term pregnancy	Yes	No			
Number %	13 48.1	14 51.9			

Table 2: Stage of Pregnancy and Smoking Behavior

Numbers of participants recruited from the first, second and third trimesters were similar.

Participants were asked what changes had taken place with their smoking since finding out about their pregnancy and whether or not this was the first pregnancy taken to full term in order to analyze changes in smoking status for first and subsequent pregnancies. Most participants had either quit smoking or cut down after finding out that they were pregnant. Table 3 provides information about participants' readiness to quit smoking and daily smoking rates.

Planning to quit in 30 days			Y	es					N	Ιο		
Number	18				8							
%	69.0				31.0							
Average # of cigarettes smoked daily	1	2	3	4	5	6	7	8	9	10	11	12
Participant Numbers	5	1	1	3	1	1	5	3	1	3	1	2
%	18.5	3.7	3.7	11.0	3.7	3.7	18.5	11.0	3.7	11.0	3.7	3.7

Table 3. Readiness to quit and daily smoking rate

Assessment of participants' stage of change was based on Prochaska's Stages of Change theory, which explains how people progress through a series of six stages to change a behavior. People in the precontemplation stage are not currently considering change. Ambivalence exists in the contemplation stage; people are not considering change within the next 30 days. In the preparation for action stage, some experience with change has taken place and planning is in place to act within 30 days. A person in the action stage has been practicing the new behavior for three to six months. Assessment of participants' stage of change was based on answers to the questions "Do you intend to quit smoking in the next 30 days (see table 3 above) and/or "Do you intend to quit smoking in the next 6 months?" Participants were defined as being in the contemplation stage if they responded "yes" to wanting to quit smoking in the next 30 days. Participants in the action stage who had already quit were identified with an earlier question about changes in smoking status since confirmation of their pregnancy. One negative response was received to the question asking if participants intended to quit smoking "in the next 6 months." The response was excluded from no responses in the table above because of the survey skip pattern (i.e. participants were not asked if they intended to quit within the next 30 days if they gave a no response to six months). The actual number of "no" responses (precontemplators) was 9.

All participants were asked how many cigarettes they currently smoked per day. Two participants smoked less than one cigarette a day but were included in the score for smokers smoking one cigarette daily. Participants who were in the process of reducing daily the amount smoked since finding out they were pregnant provided a count of the number of cigarettes smoked the day before completing the survey. Table 4 lists the number of participants scoring at each level of the Fagerstrom Tolerance Scale.

Score	3	4	5	6	7
Numbers	1	1	9	12	4
%	3.7	3.7	33.3	44.4	14 8

Table 4. Distribution of scores on the Fagerstrom Tolerance Scale

Note: scores on the Fagerstrom Tolerance Scale range from three to seven.

Fagerstrom Tolerance scores were calculated for each participant and score frequencies recorded in Table 4. Twenty-five participants (92.5% of the sample) recruited received Fagerstrom tolerance scores between five and seven on this scale; a score between five and seven indicates a high level of nicotine dependence. The average daily consumption of cigarettes for this population was low compared with women of similar age who are not pregnant. A possible explanation for this may be factors predisposing participants to underestimate their tobacco use, for example, exacerbation of the social bias against tobacco use during pregnancy. Fagerstrom scores appeared high by comparison. Participants' declared smoking rates may be inaccurate, or the Fagerstrom tolerance scale may lack validity for this population. Most participants who were still smoking began tapering their tobacco use after pregnancy was confirmed. Managing withdrawal symptoms could also explain low consumption numbers compared to high Fagerstrom scale scores.

Table 5 contains details of participants' psychosocial characteristics as they relate to tobacco use. Mental health and/or addictions issues (schizophrenia, depression, alcohol or other substance abuse) were present for one participant. In an open-ended question, participants were asked how much time they spend in situations where others smoke indoors (hours weekly, monthly, annually or never). Sixteen participants replied "never" when asked to gauge the amount of time exposed to second hand smoke exposure indoors.

**Treatment for mental** Yes No health issues/substance abuse 26 Numbers 1 3.7 96.3 % of sample **Confidence to** A lot A little Not at all quit smoking Numbers 15 10 2 7.4 % 55.6 37.0 More than one smoker Yes No in household Numbers 12 15 % 44.4 55.6 **Smoking in house** Yes No Numbers 7 20 % 25.9 74.1 Second hand smoke Monthly Weekly Daily Never Exposure

Table 5. Psychosocial characteristics and tobacco use

Over 50% of participants selected the highest ratings for self-efficacy; the participant was the only smoker in over 50% of households and 22 out of 27 said they had at least one person they could count on for support while quitting. Stress appeared to be a factor for most participants (see Table 6).

3.7

4

21

6

16

1

1

Average Hours

Numbers

Help from a support person	Yes	No	Don't know	
Number	22	4	1	
%	81.5	14.8	3.7	
Role of su <b>pport</b> Person	Partner	Friend	Relative	
Numbers	12	4	6	
%	54.5	18.2	27.3	
Level of stress	Very	Somewhat	Not very	Not at all
Numbers	4	16	1	6
%	14.8	59.3	3.7	22.2

Table 6. Psychosocial Resources and Tobacco Use

## Analyses

In light of the difficulties that emerged with recruitment, which resulted in a sample size both considerably lower than planned and small in general for the use of interpretive statistics, it was recognized that interpreting study findings and drawing inferences would be challenging. Nevertheless, identified trends could potentially be informative if viewed from an exploratory perspective. Analyses of the principal outcomes were performed to determine whether there was any substantive evidence that they could be predicted from characteristics measured at baseline. Principal outcomes investigated at follow-up were: current smoking status (have you smoked a puff in the last seven days), smoking rate (how many cigarettes do you currently smoke daily), attempting to quit since baseline data collection (have you made at least one serious quit attempt {lasting more than 24

hours} since you completed the survey). A further outcome of interest was simply study completion (participants who completed/did not complete the study).

Analyses to explore relationships between binary predictor and outcome variables were performed using the Phi coefficient. This procedure is sensitive to sample size and the exact binomial probability can be evaluated. Pearson Product-Moment correlations were conducted between binary outcome variables and continuous predictor variables and between the continuous outcome variable and binary predictor variables. Table 7 identifies variables involved in the prediction of binary outcomes from binary predictors. Table 8 identifies variables involved in binary to continuous predictions.

Missing values were treated as missing values throughout the analyses. Each analysis was univariate. All analyses were based on individuals who had observations on each variable.

Few responses were recorded for questions included in the database pathway followed (during the baseline interview) with First Nations participants. Only three First Nations women completed the follow-up. Data collection following pathways specific for women living on and off reserve further divided the sample of three into smaller groups. Analysis of variables along these pathways was not performed. Table 7. Binary Predictor Variables Included in Phi Analyses with Binary OutcomeVariables and Pearson Correlation Analyses With Continuous Outcome Variables

Binary predictor variables

Currently smoke cigarettes

Smoked 100 cigarettes in lifetime and quit in last 7 days.

Intend to quit in next 30 days

Ever tried to quit

Employed

1<sup>st</sup> pregnancy taken to term

**First Nations Status** 

Treated for Mental Health problems and substance abuse

More than one smoker living in house

Smoking allowed in house

Moved in last year

Daily access or own vehicle

 Table 8. Continuous Predictor Variables Included in Pearson Correlation Analyses with

Binary and Continuous Outcome Variables

Continuous variables

Age 1<sup>st</sup> cigarette

Trimester

Distance from town center

Interview time

Fagerstrom score

Times quit

Times last 6 months

SH smoke exposure daily (inside)

Cigarettes smoked daily

Statistically significant relationships found between predictor and outcome variables were limited and are shown in Table 9.

**Outcome variable Predictor variable** Significance Smoked puff in last Currently smoking cigarettes Phi = .714, n = 12, *p* < .05 7 day Baseline stress level. r = -.638, n = 12, p < .05Quit attempt in last Daily exposure to second hand r = -.888, n = 12, p = .05two months smoke (SHS) indoors Confidence in ability to quit. r = -.625, n = 12, p < .05Partner support Phi = .828, n = 11, p < .05.

 Table 9. Pearson r Correlation and Phi Analyses Reaching Significance

A single puff smoked within 7 days of follow-up. Cross tabulations of binary predictor variables (see Table 7) were conducted with the binary outcome variable "a single puff smoked within 7 days of follow-up." A statistically significant positive correlation was found between current smoking and having smoked a single puff within the last seven days. Smokers at baseline were more likely to have smoked within seven days of follow up. A significant negative correlation was found between smoking within seven days of follow up and participants' baseline stress level. In other words, as the reported level of stress at baseline decreased the likelihood of not having had a single puff within seven days at follow up increased. No other significant predictive relationships were found. *Number of cigarettes smoked daily.* Pearson's r Product Moment Correlations were conducted with outcome variable number of cigarettes smoked daily and continuous predictor variables from baseline. No significant relationships were found.

One serious quit attempt (lasting more than 24 hours) since enrolling in the study.

A Pearson's r correlation coefficient was computed to assess the relationship between daily exposure to second hand smoke (SHS) indoors and whether one serious quit attempt was made since enrolling in the study. An inverse relationship existed between the two variables r = .888, n=12, p = 0.05. Women exposed to higher levels of daily SHS indoors appear less likely to make a quit attempt. Only three participants who completed the follow-up (and were still smoking) had made a serious quit attempt since completing the baseline survey. Making a serious quit attempt during the two months between baseline data collection and follow-up was significantly and inversely related to participants reported confidence in their ability to quit. The findings suggested that greater reported confidence in quitting ability lessened the likelihood that a serious quit attempt would take place.

A cross tabulation analysis found a significant relationship between partner support to quit smoking and having made one serious quit attempt since enrolling in the study. Having a supportive partner was associated with a greater likelihood of having made a serious quit attempt.

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*Completed, not completed study.* Having completed or not completed the study was a binary variable. Cross tabulations with binary predictor variables from the baseline survey were conducted. A significant negative association was found between participants who completed/did not complete the study and Aboriginal status Phi = -.472, n=27, p = 0.05. Aboriginal status was associated with a lower likelihood of completing the study. No other significant relationships were observed. Likewise, there were no significant correlations between continuous predictor variables from baseline and study completion.

#### Discussion

#### Chapter Eight

It had originally been the intention to conduct a short-term, prospective study of predictors of smoking cessation in a sample of pregnant smokers living in a northern, rural context with a view to identifying variables that could assist in the process of optimizing the match between important patient characteristics and smoking cessation interventions. As the study process unfolded, it became clear that to accomplish such a study in this context would be a significant challenge. This discussion will address the findings as they evolved in the study in addition to reflecting on the challenges that arose as they might inform future research.

Important to this discussion will be the description and evaluation of the study experience. Relationships between predictors of cessation and cessation outcome and the subsequent implications have been identified and interpreted within the limitations of the small sample size and the uniqueness of the northern remote rural context. Issues specific to the northern region and impacting the study outcome are discussed. Included in the discussion is a description of the challenges to meeting goals for participant recruitment and retention and some suggested strategies to overcome these challenges. Finally, the study purpose is revisited. Is it reasonable to assume that developing a research design that includes strategies to overcome identified difficulties with recruitment and retention will produce successful results based upon the original research goals? Consideration is also given to the question "is the idea of modifying a triage tool for use with pregnant smokers in northern BC realistic?"

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#### Relationships among predictors and cessation outcome.

The main empirical findings of the study must be interpreted with caution. Nevertheless, they may contribute information from an exploratory perspective. In particular, inaccuracies may exist where moderate relationships between variables may misleadingly be interpreted as insignificant due to the limited sample size.

Only 12 participants completed the follow-up survey; however, the 12 who completed provided a sample of smoking behavior change for women who mostly fit a profile of current unemployment, annual relocation, a somewhat stressful lifestyle, high Fagerstrom scores, limited access to transportation, and high school education level. Prior studies have demonstrated that predictors of smoking cessation during pregnancy for the general population typically include nicotine dependence, self-efficacy, stage of change, and demographic characteristics such as ethnic group and education (Lesa et al.,1999). An inverse relationship was found in this study between the number of hours exposed to second hand smoke daily and making a quit attempt implying that a quit attempt appears less likely for pregnant women as the level of exposure to second hand smoke indoors increases. Overall smoking rates are generally higher in the north (as seen in figure 2), which in turn may lead to greater second hand smoke exposure and higher smoking rates for pregnant women.

Social support from friends and family does not appear to be a frequent predictor of change in smoking behavior during pregnancy (Lesa et al., 1999). Findings from this study, however, suggest that women receiving support from a partner (spouse) were more likely to make a quit attempt than women receiving support from friends or other family

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members. Research by Bottorf et al, (2006) describes the impact a partner has on quitting smoking as usually successful if partner interactions around smoking behavior (habits and routines) are supportive of the quit attempt from the onset. Partner influence on smoking behavior is usually greater than the influence from people outside of the home. Frequencies generated in the study indicated that over 50% of women who participated in the study had a partner who was supportive of their quit attempt, suggesting the possibility of a successful quit attempt was greater for these women than for women with non supportive partners.

#### **Overall Study Experience**

Time spent in the study region prior to conducting the study provided an understanding of the research context and of the expected flow of clients/patients through each of the participating pre-natal agencies for the duration of the study. Records of births from the last two years for patients attending each agency were reviewed to establish potential numbers and the time frame needed for recruitment. Posters and recruitment resources were delivered to service providers assisting with data collection within two weeks of data collection. At this time, recruitment expectations were positive. However, as the implementation of the study rolled out, it became obvious that recruitment expectations would not be met.

On reflection, a number of barriers to successful recruitment were identified, including transience, attrition and social change around tobacco use. Participants interested in taking part in the study came mostly from Prince George and mostly from two agencies. Almost a third of the participants who provided contact information were unreachable and many were contacted at alternative telephone numbers provided by friends and

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family who answered the phone. Contacting participants with follow-up calls two months after baseline data collection was equally challenging. In some instances telephone service had been discontinued. People other than the respondents (who were unable to assist) answered calls. Many calls were unanswered. Approximately half of respondents who completed the follow-up expressed discomfort and feelings of guilt associated with their situation (smoking during pregnancy) if still smoking, and expressed concern with daily stress. Smokers identified by health care professionals as "at risk" and asked if they would like to participate in tobacco research were reported to be guarded or disinterested where no prior discussion about their tobacco use had taken place. Most of the participants recruited from the "Healthiest Babies Possible" agency in Prince George were considered "high risk" because of adverse personal circumstances with the potential to impact their pregnancy. They had on site access to tobacco information, education around the effects of tobacco use and counselling for cessation support during pregnancy and postpartum. Most participants referred by the agency appeared to be comfortable discussing their tobacco use. Recruitment is more likely to be successful with women who have had the opportunity to discuss their tobacco use with a health care professional with whom they have had the opportunity to develop a trusting relationship and who has training in the field. Counselors at the agency follow Nicotine Intervention Counselling Center protocol and when providing service for high-risk smokers, their approach is to address the sometimes-defensive response arising from the myth that smokers are "deviant," and to develop open discussion about the benefits of quitting.

Informal evaluation of the study process took place during bi-weekly telephone calls with service providers during data collection. All were surprised at the low response rate

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and most concurred that the numbers of declared smokers were considerably lower than expected, but that the number of undeclared smokers was unknown. Service providers suggested that some women may be intimidated by the study as a result of increasing social change promoting the denormalization of tobacco use and will be less likely to identify themselves as smokers.

### Impact of the Rural Remote Northern Setting on the Study Outcome

Populations in the smaller communities were sparse and scattered. For this reason, the researcher was dependent upon service providers familiar with both the community and its residents in order to be able to reach and maintain contact with more isolated members of the target groups. A small sub-population of pregnant women who were also smokers existed in each community (the number of undeclared smokers at the time of the study was unknown). Approximately half of the sub population was First Nations women. First Nations women who lived on reserve accessed health care services on reserve provided by the attending community nurse. First Nations women living in the community accessed community health care services. First Nations women wanting prenatal and postnatal support services frequently accessed the Native Friendship Center in the community closest to where they lived. First Nations contacts at each remote site promoted the study, but had poor response rates. Providing First Nations service providers with tobacco training with which to inform prospective participants at the remote sites may empower them to generate more interest. Well-established Best Practices training is available through the Nicotine Intervention Counseling Program. Providing training to service providers in remote areas is taking place; however funding and capacity constraints will impact the time period of training delivery to all sites.

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Transience was a factor that likely affected the success of this study in northern BC communities. Over half of the participants recruited to the study had moved house in the twelve months prior to recruitment. For this reason, the researcher collaborated with colleagues from the Northern Health Authority's Tobacco Reduction Team, working in the target areas to connect with Aboriginal and non Aboriginal pre-natal service providers in participating communities. The potential for meeting recruitment goals and retaining recruited participants appeared to be satisfactory, however, service providers in the outlying communities were either unable to reach, or had negative responses from women they approached. Service providers trained in tobacco cessation skills will be better able to influence attitudes towards smoking and to promote changes in smoking behavior.

Ten of the 27 recruited participants lived in communities outside of Prince George (Terrace, Rupert, Hartley Bay, Fort St John). Face to face meetings with service providers at doctors' offices, health units, pregnancy outreach services in these communities and with First Nations Friendship Centers and First Nations service providers on reserve took place during study development and again prior to data collection. Service providers contacted during data collection identified 'moving to a new area' and 'patient's reluctance to reveal smoking behavior to prenatal service providers' as reasons for low recruitment and poor retention. Transience was recognized as a potential problem before the study began, and addressed by obtaining cell phone contact information for most participants. Participant reluctance to declare smoking behavior was not anticipated to the extent encountered.

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Participant baseline recruitment expectations over a four-month period from communities outside of Prince George (Terrace and Prince Rupert) and based upon estimates by service providers were collectively between 60 and 70. In the end, one participant from Terrace and one from Prince Rupert were available to complete the follow-up survey. Service providers in these regions promoted the study with each prospective participant during a single scheduled pre-natal visit. On site recruitment and frequent communication between a health care provider trained in the discipline and women in the remote regions might increase and retain participant interest. Case study research looking at a detailed contextual analysis of smoking during pregnancy, issues specific to living in northern regions and their relationships might be more appropriate preliminary research with which to look at predictors of smoking for this population. *Recruitment and Retention.* 

Recruitment numbers were highest at two participating health care facilities in Prince George. The first was a pregnancy outreach agency where marginalized women attended the agency weekly while actively seeking help for other issues related to their pregnancy. All staff at the agency were trained according to certification requirements set out by the Nicotine Intervention Counselling Center (NICC) and actively counselling clients. Monthly tobacco reduction/cessation rates at the agency rose consistently over a 12 month period. The second facility was a larger community medical practice where a systematic procedure agreed upon by medical office assistants working in the practice was implemented for the recruitment period. Staff flagged all pre-natal files, inserted waiver and contact information documentation provided by the researcher into the files and advised MD'S of the new protocol. Participant retention at follow-up at the

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pregnancy outreach agency was 33% of the total and 50% at the Medical practice. It was possible that recruitment efforts at other facilities were either perceived as low priority, or staff lacked the skills and training required to address tobacco use with their patients/clients. Medical practice recruitment could be effective if MD's and staff endorse the research and systematically incorporate communication about tobacco use into standard patient care. Many medical doctors are addressing tobacco use with their patients but this is not routine practice with all MD's.

#### Strategies to Overcome Problems with Recruitment and Retention.

It is imperative for the success of future research to understand existing barriers to successful recruitment and retention for research with this population and to adapt the study design to the population characteristics of Northern regions.

Service providers have become increasingly aware of the impact that recent tobacco legislation and regulations appear to have on many women's willingness to discuss and address tobacco use. Reevaluating how to approach the issue for the purpose of both research and intervention appears to be a necessary step in the paradigm shift to tobacco denormalization.

Recruiting and retaining participants for future research may be more successful with direct involvement from MD's where tobacco use is addressed systematically at patient visits. Evidence of this was noted following successful recruitment at a medical practice in Prince George. Including discussion of tobacco use as standard care appeared to promote retention and establish the idea of cessation as important. Participants referred to the tobacco cessation component of their medical interview when contacted by the researcher. Physicians are not currently reimbursed for addressing tobacco use. Health

care policy change incorporating discussion about tobacco use into standard care medical practice may be possible in the future. Medical doctor involvement in time limited research where the demand on their time is minimal and supporting staff can assist with extra paperwork should be explored. Reimbursement for brief intervention about tobacco use may be possible when incorporated with discussion about other lifestyle choices impacting patient health.

Pregnancy outreach agencies are a highly utilized resource for pregnant women in the north. The agencies counsel for a variety of presenting issues and during that time, are able to develop a productive rapport with clients. Where staff were also trained as tobacco cessation counsellors, promoting cessation was included in standard care in these facilities. Addressed in this context, clients were likely to perceive their tobacco use as an important issue. Outreach agencies are in an excellent position to encourage women they know to be undeclared smokers to address their tobacco use, to maintain contact with participants and to support them in completing the research process. First Nations women regularly visiting Native Friendship Centers in their community often continued the practice after moving to another residence in the same community. First Nations counsellors providing support at these sites are in an excellent position to maintain contact with women after they relocate. Increasing capacity at the site by providing tobacco cessation counselling training to center support workers would be of benefit to research in the field and to the community.

Incentives for participants were an excellent way to demonstrate appreciation in both environments. Participants frequently identified the gift basket as the reason for taking part in the study. Potential participants may be lost without some form of gratuity for their time.

# Is the Idea of Modifying a Triage Tool for use With Pregnant Smokers in Northern BC Realistic?

The purpose of the original triage tool was to match smokers to treatment condition and to provide effective care without over or under prescribing treatment. Practical advantages support modifying the tool and making it available to health professionals in northern remote areas. Small communities in the north strive for local control and authority over health care services. Were an appropriate tool available, health care professionals without expertise in (tobacco) addiction could recommend treatment intervention using a population specific diagnostic tool reflecting best practices. This would be especially important where tobacco reduction reflects the priorities established by the communities themselves. Considering the triage tool as an end point for future research in the field is a realistic idea; however, more immediate research goals need to address the barriers to producing empirical research from which to develop and validate questions.

## Suggestions for Future Research

Barriers to successful recruitment were transience, attrition and social change around tobacco use. Strategies were identified that may provide solutions to issues of recruitment and retention; however, women's reluctance to talk openly about their smoking behavior is likely a reaction to the paradigm shift away from the acceptability of tobacco use. Testing for the presence of nicotine during routine blood work procedures would provide a more accurate view of prevalence rates, but may not change resistance to talking about

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smoking behaviors in the research context. Medical practice recruitment could be effective for research with this population. Encouraging medical doctors and their staff to systematically incorporate communication about tobacco use into standard patient care would be a good starting point - more work needs to be done in this area.

Repeating the research as a series of case studies or as a qualitative design using snowball sampling would provide information valuable at a different level of the analysis. The goal would be to inform an understanding of the process involved in cessation by identifying common themes from a detailed contextual analysis of smoking during pregnancy, issues specific to living in northern regions and relationships between them. A combined quantitative and qualitative design would generate data useful for predicting smoking during pregnancy.

The researcher would be responsible for participant selection and would secure the relationship by staying in frequent contact with participants throughout the study. Partnerships developed between the researcher and First Nations service providers would be fostered to help with data collection, to share knowledge about tobacco use, and to increase the capacity with which to develop support strategies for women in the community.

Nationally and provincially we are seeing a paradigm shift towards the denormalization

of tobacco use. Changes to the Tobacco Control Act, smoke free grounds policies adopted by the provincial health authorities and internal policy changes taking place in business and community settings are rapidly affecting social tolerance for tobacco use.

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## Appendix A

Issues for Discussion with Health Care Professionals

- The number of pregnant smokers accessing tobacco control services.
- Resources currently available to meet the needs of pregnant smokers in the Terrace/Rupert communities.
- The challenges and barriers to tobacco cessation service provision for pregnant smokers.
- Geographic isolation and cultural specificity.
- Current recommendations to pregnant smokers by health care workers.
- Suggestions regarding what should be done to resolve the unmet needs of pregnant smokers with respect to cultural differences in tobacco use for First Nations Communities.
- Prioritizing smoking cessation for women experiencing high levels of stress in their immediate environment.
- High spousal/partner smoking prevalence rates.

## Appendix B Northern BC Recruitment Script and Baseline Survey for Pregnant Smokers



Hello my name is \_\_\_\_\_\_ and I am calling from the Survey Research Centre at the University of Northern British Columbia and the Northern Health Authority.

May I speak to \_\_\_\_\_?

01 YES

02 NO \_\_\_\_\_ is not available

03 NO \_\_\_\_\_ inconvenient.

Record convenient call back time.

# B. CONSENT SECTION

The purpose of this project is to gather background information for the development of a tool that health care providers can use to refer pregnant women who live in northern remote areas, and who want to quit smoking to more effective treatments . Information you provide will help to identify some of the challenges you may face with quitting. If you agree to participate we will ask you some questions about yourself and your smoking behavior. This will take about 20 minutes. We would like to contact you again on the first day of the third trimester of your pregnancy to find out if any changes to your smoking routine have taken place. The second interview will complete your involvement in the research study and will take approximately 10 minutes. Completion for the entire study will take place by August 2009.

The study is supervised by Dr. Ken Prkachin in the Department of Psychology at the University of Northern British Columbia. If you have any concerns, I can provide you with contact information for the Office of Research at UNBC.

Participation in this study is voluntary. You may refuse to answer any question, or withdraw from the study at any time without consequence. Identifiable information we collect during the study will be completely confidential. Access to the information you provide will be limited to the research team. The team consists of the researcher Denys Smith (and immediate supervisor), a trained interviewer and the interview manuscript programmer, Jason Lindo who will be maintaining the study software. Any personal information used for data processing or application testing will be stored on computers accessible only by web consultant, Jason Lindo, or designated employees of the consulting company SRI (Strategic Research Innovations). Security measures for data include but are not limited to password protection and data encryption. Information you provide will, after data collection is complete and within 12 months, be combined with information from other participants using ID code rather than name or other identifying information to protect your privacy. The original files containing your name and contact information will be permanently destroyed within 12 months of the date you complete the first interview. The compiled data with all identifying information removed will be retained for 5 years in a locked laboratory at UNBC. Participating in the study presents no known risks

I'd like to begin by asking a maximum of six questions to confirm that you are eligible to participate Would. you be willing to participate in the study?

01- YES

Thank you very much for agreeing to participate.

02- NO/I don't have time right now. Is there another time that would be more convenient for you?

YES - Record more convenient time:

C. ASSESSMENT OF ELEGIBILITY

Q1 Are you currently in the first or second trimester of your pregnancy

01 – Yes 09 - Refuse 02 - No

If No- Thank you but our study requires participants to be currently pregnant Note for interviewer here:

Be prepared to deliver a sensitive response to this question because it is possible some people may have lost their babies or terminated the pregnancy between the clinic visit and your call.

Q3 Do you currently smoke cigars, cigarillos or a pipe?

01 – Yes 09 - Refuse 02 – No

Q4 Do you currently use spit tobacco, chewing tobacco, snuff or other smokeless tobacco products?

01 – Yes 09 - Refuse 02 – No

- Q5 Do you currently smoke cigarettes?
  - 01 Yes 02 – No
- Q6 Have you smoked at least 100 cigarettes in your lifetime? INTERVIEWER NOTE: 100 cigarettes = 5 packs of 20 cigarettes or 4 packs of 25 cigarettes.

### 01- Yes GO TO Q 5A.

02- No Thank you but we are looking for someone who has smoked at least 100 cigarettes in their lifetime. Thank you for your time. Goodbye.

**IF REFUSES/CAN'T SAY:** Thank you but we need to make sure participants have smoked at least 100 cigarettes in their lifetime. Thank you for your time. Goodbye

Q6 A Have you smoked at least 100 cigarettes in your lifetime and quit smoking in the last 7 days

01 – Yes 02 - No

Q7 What year were you born? | 19 \_\_\_\_\_

IF YEAR < 1989, ELIGIBILITY YES - 03

IF YEAR = 1989, ELIGIBILITY YES - 03 IF YEAR > 1990, ELIGIBILITY NO

01 -IF REFUSE/CAN'T SAY: We require this information to determine if participants in this survey are 19 years of age or older. The study is only suitable for adults, could you confirm that you are at least 19 years of age?

02 - If No. Unfortunately, this study is only suitable for adults. If you want information on quitting smoking please call the Nicotine Intervention Counseling Centre at the Northern Health Authority. The number is 250-565-7011 Thank you for your time. Good-bye.

Q7 A What month were you born? Jan – Dec)

We need this information to determine if you are 19 yrs of age at the time the survey is completed.

## **03 - ELGIBILITY - YES**

We've determined that you are eligible to participate in the study. I would like to begin by asking you some questions about your smoking rout

## D. SMOKING BEHAVIOR AND HISTORY

- Q8 How would you describe your smoking now that you are pregnant?
  - 01 you smoke regularly, about the same as before you were pregnant.
  - 02 you smoke some but cut down since you found out you were pregnant.
  - 03 you stopped smoking after you found out you were pregnant.
  - 04 you stopped smoking before you found out you were pregnant
  - 05 you smoke more now that you are pregnant
- Q8 A Is this the first pregnancy you have taken to term?
  - 01 Yes 02 - No

## Q9 Stage of Change algorithm (use Q 3 to assess current smoking)

b. Do you intend to quit smoking within the next 6 months?

- \_\_\_ YES
- \_\_\_\_ **NO** (stage = Precontemplation)
- c. What is your reason for not choosing to quit at this time? SKIP to Q9

d. Do you intend to quit smoking within the next 30 days?

\_\_\_\_ YES (stage = Preparation)
\_\_\_\_ NO (stage = Contemplation)

Q10 On average, how many cigarettes do you smoke each day? (includes factory made and roll your own)

NUMBER	< 1 cigarette/day	don't know
		(Interviewer prompt)

Q11 Have you used any other types of tobacco in the past month?

- 01 Yes 02 - No
- If YES, what other types of tobacco have you used? (Check all that apply)

01 – Cigars or cigarillos

- 02 Pipe tobacco
- 03 Smokeless tobacco including snuff, spit and chewing tobacco 04 – Other
- Q12 At what age did you smoke your first whole cigarette?

\_\_\_\_\_ NUMBER

**INTERVIEWER NOTE:** If cannot recall exact age, ask them to approximate to the best of their ability.

## E. FAGERSTROM SCALE OF NICOTINE DEPENDENCE

- Q13 How soon after you wake up do you smoke your first cigarette? (**READ ALL OPTIONS**)
  - 03- Within 5 minutes 02- 6-30 minutes 01- 31-60 minutes 00- After 60 minutes
- Q14 Do you find it difficult to refrain from smoking in places where it is forbidden (e.g. in church, at the library, in cinema, etc.)?

01-Yes 02- No

Q15 Which cigarette would you hate most to give up?

01- The first one in the morning 00-All others

Q16 Do you smoke more frequently during the first 2 hours after waking than during the rest of the day?

01 - Yes 02 - No

- Q17 Do you smoke if you are so ill that you are in bed most of the day?
  - 01 Yes 02 - No

Programming note: Calculate Fagerstrom score – include question 9

Q18 Have you ever tried to quit smoking?

01- Yes GO TO Q 22a 02- No GO TO Q 23

Q19 How many times have you ever tried to quit smoking?

\_\_\_\_\_ NUMBER

**INTERVIEWER NOTE:** If range given and can't give a specific number, then enter mid-point (round up if fractional). If answer is "lots", "hundreds of times", etc.., please ask them to estimate the number (or range) of actual quit attempts.

F. OUITTING BEHAVIOR

Q20 How many times have you tried to quit smoking in the last six months?

\_\_\_\_\_ NUMBER

**INTERVIEWER NOTE:** If range given and can't give a specific number, then enter mid-point (round up if fractional). If answer is "lots", "hundreds of times", etc.., please ask them to estimate the number (or range) of actual quit attempts.

Q21 What is the longest time you have gone without smoking even a single puff? (e.g. 1 day, 6 weeks, 5

months)?

\_\_\_\_\_ hour(s) \_\_\_\_\_ day(s) \_\_\_\_\_ week(s) \_\_\_\_\_ month(s)

G. DEMOGRAPHIC QUESTIONS

I am now going to ask you a few questions for statistical purposes.

- Q22 Are you currently employed?
  - 01 Yes
  - 02 No

## **INTERVIEWER NOTE: Employment includes self-employment and shortterm disability. Long-term disability = unemployment**

Q23 What is the highest level of formal education that you have completed?

## **DO NOT READ (Circle most appropriate response)**

01- Elementary school or some high school
02- Completed high school
03- Technical or trade school or community college (some or completed)
(If they select 03 - ask "Was this a University transfer program?" If
YES, select 04)
04- Some university (no degree)
Completed university degree and/or post-graduate degree

- Q24 Are you currently married, separated, divorced, widowed, living common-law, or single?
  - 01- Married
    02- Separated
    03- Divorced
    04- Widowed
    05- Common Law
    06- Single
- Q25 Have you moved from where you normally live in the last year?
  - $\begin{array}{c} 01 \mathrm{Yes} \\ 02 \mathrm{No} \end{array}$

Jason we need a note to interviewers to define the construct " change of residence" as opposed to temporary alternative living arrangements. (i.e. has the individual changed their mailing address).

H. FIRST NATIONS PARTICIPANTS

- Q26 Programs are designed to meet the needs of everyone in the community. In order to help us accomplish this, could you tell me whether you consider yourself to be Aboriginal, which includes First Nations, Métis and Inuit?
  - 01 Yes (go to question 26 FN module)
  - 02 No (go to question 35).

## Q27 How do you normally obtain your tobacco products?

- 01 purchase
- 02 borrow
- 03 receive as a gift
- 04 other
- 01 on another reserve
  02 off reserve
  03 on your reserve Go to Q 29.
- Q29 Are cigarettes sold in your community/reserve?
  - 01 Yes 02 – No 03 – I don't know
- Q30 Can you buy tobacco products cheaper on reserve than off reserve? 01 – Yes 02 – No
  - 03 I don't know
- Q31 Is smoking permitted at the bingo hall on reserve?
  - 01 Yes 02 – No 03 – I don't know
- Q32 Is smoking permitted at the local community hall on reserve?
  - 01 Yes 02 – No 03 – I don't know
- Q33 Are you familiar with the sacred use of tobacco
  - 01 Yes 02 – No

# I. TRANSPORTATION

Q34 How far away from the nearest town do you live

- 01 0-5 kilometers
- 02 5 10 kilometers
- 03 10 20 kilometers
- 04 more than 20 kilometer
- Q35 Do you own or have access to a vehicle on a daily basis

01 – Yes

- 02 No
- 03 most of the time
- 04 some of the time
- 05 occasionally
- 06 never
- Q36 What means of transport do you use most frequently (select all that apply).
  - 01 a ride from a friend/neighbor/family member
  - 02 catch a bus
  - 03 take a taxi
  - 04 walk/hitch hike/ ride a bike
  - 05 use your own vehicle

## J. PSYCHOLSOCIAL ISSUES

- Q37 Have you ever been diagnosed or treated by a doctor for schizophrenia, depression, alcohol, or other substance abuse?
  - 01 Yes 02 - No
- Q38 How confident are you that you will be able to quit smoking? 01 - A lot 02 - A little
  - 03 Not at all
- Q39 Is there one or more smokers living in your household?
  - 01 Yes 02 – No
- Q40 Is smoking allowed in the place where you usually live?
  - 01 Yes 02 – No
- Q41 Can you estimate how much time you spend in situations where others smoke indoors?(please check only one).
  - 01 hours daily
  - 02 hours weekly
  - 03 hours monthly
  - 04 hours annually
  - 05 Never

- Q42 How much time would you say you spend in situations where others smoke outdoors?
  - 01 hours daily
  - 02 hours weekly
  - 03 hours monthly
  - 04 hours annually
  - 05 Never
- Q43 Do you have at least one person (a friend, family member or partner) you can count on for support while you quit smoking?
  - 01 Yes 02 – No 03 – I don't know
- Q44 Is this person your partner, a friend, or a relative?
  - 01 partner
  - 02 friend
  - 03 relative
- Q45 Would you describe your life as very stressful, somewhat stressful, not very stressful, or not stressful at all?
  - 01 Not stressful at all
  - 02 Not very stressful
  - 03 Somewhat stressful
  - 04 Very stressful

#### Collect name, and confirm phone number(s) for participant and alternate contact.

a. May I please get your name, address and phone number so that we can send a gift basket for you and your baby as a thank you for participating in the research study.

01 - Yes (Collect information) 02 - No

If No - where would you like us to send the gift basket?

 Name:
 \_\_\_\_\_\_

 Address:
 \_\_\_\_\_\_

Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_

Phone Number: ( ) \_\_\_\_\_ --- \_\_\_\_ --- \_\_\_\_

b. In the event that your telephone number has changed and we are unable to contact you is there a close friend or relative that we may contact in order to get in touch with you?

01	Yes (Collect information)					
02	No - That's okay. (Go to Q36)					
Alternate Na	ume:					
Address:						
Province:	Postal Code:					
Phone Num	ber: ( )					

Once again thank you for participating in the study. We will call you again in three months to ask you questions about your smoking routine.

### Appendix C Northern BC Two Month Follow-Up Evaluation Survey for Pregnant Smokers

## <u>1<sup>st/</sup> 3<sup>rd</sup> party contact</u> Hello, may I please speak with [participant name].

- 01 Yes (go to Section 2)
- 02 No, she is not available at the present time

My name is [ ] and I'm calling on behalf of a research team at the University of Northern British Columbia. Could you tell me a good time to call back so that I could talk with \_\_\_\_\_? (record call back time)

### 1<sup>st</sup> party contact

03 - No, they no longer live here

My name is [ ] and I'm calling on behalf of a research team at the University of Northern British Columbia. [Participant name] is part of the research study we are conducting. Would you know how I could contact them?

### 3<sup>rd</sup> party contact

03 - No, they do not live here

My name is [ ] and I'm calling on behalf of a research team at the University of Northern British Columbia. [Participant name] is part of the research study we are conducting. S/he gave your name as a contact. Would you know how I could contact [participant name]?

### If YES

New telephone: New address: New email: If NO - Do you have the name and telephone number of someone who might know where I could contact []? If yes: New telephone: New address: New email: Name of third party contact: Life new telephone contact: New email: Name of third party contact: Life new telephone contact: New email: Name of third party contact: Life new telephone contact: New email: Name of third party contact: Life new telephone contact: Life new telephone contact: New email: New telephone contact: New telephone contact: New email: New telephone contact: New telephon

If no: Thank you very much for your time. Good bye.

2. Hello [participant name], my name is [ ] and I'm calling on behalf of Dr. Ken Prkachin and Denys Smith from the University of Northern British Columbia. About 3 months ago you enrolled in his study on quitting smoking. We are calling to ask you a few follow-up questions that will take about 10 minutes of your time.

Your participation will help improve quit smoking services in British Columbia. Participation is completely voluntary and all of your answers will remain confidential. If there is a question that you would prefer not to answer, just say so and we'll go on to the next one. You may also decide to withdraw from the study at any time. I would like to remind you that access to the information you provide will be limited to the research team. The team consists of the researcher Denys Smith (and immediate supervisor), a trained interviewer and the interview manuscript programmer, Jason Lindo who will be maintaining the study software. Any personal information used for data processing or application testing will be stored on computers accessible only by web consultant, Jason Lindo, or designated employees of the consulting company SRI (Strategic Research Innovations). Security measures for data include but are not limited to password protection and data encryption. Information you provide will, after data collection is complete and within 12 months, be combined with information from other participants using ID code rather than name or other identifying information to protect your privacy. The original files containing your name and contact information will be permanently destroyed within 12 months of the date you complete the first interview. The compiled data with all identifying information removed will be retained for 5 years in a locked laboratory at UNBC. Participating in the study presents no known risks I'd like to begin by asking a maximum of six questions to confirm that you are eligible to participate would you be willing to participate in the study?

Is now a good time to conduct the survey?

If **YES** - Let's continue.

*If NO* - *When in the next day or two can we call you back? The survey only takes about 10 minutes.* 

If they request an inappropriate date: It is important to the evaluation that we conduct this survey within two weeks.

<u>(Day, Time)</u>

*If REFUSED or not able to complete in two weeks:* I understand. Thank you for your time. Good bye.

### A. SMOKING BEHAVIOUR

I'd like to begin by asking you a few questions about your smoking.

1. Have you smoked, even a single puff, in the last 7 days? (Jason - if Q#1=YES, then skip 2&3)

YES \_\_\_\_\_NO \_\_\_\_DON'T KNOW/CAN'T SAY

- 2. Have you smoked, even a single puff in the last 30 days? (Jason if Q#2=YES, then skip 3)
  - \_\_\_\_YES \_\_\_\_NO \_\_\_\_DON'T KNOW/CAN'T SAY
- 3. Have you smoked, even a single puff since we last called you on (**Recruitment Date**)?

\_\_\_\_YES \_\_\_\_NO \_\_\_\_DON'T KNOW/CAN'T SAY

4. At the present time, how many cigarettes do you currently smoke per day?

\_\_\_\_\_ # \_\_\_\_\_ < 1 cigarette/day \_\_\_\_\_ None

5. At the present time how many cigars, pipes or other tobacco products do you smoke each week?

\_\_\_\_\_ # \_\_\_\_\_ < 1/day \_\_\_\_\_ None

6. At the present time, how many pouches or tins of snuff or chewing tobacco do you use each week?

\_\_\_\_\_# \_\_\_\_\_< 1/day \_\_\_\_\_\_None

- 7. When is the last time you smoked a cigarette?
  - \_\_\_\_\_ less than a day ago \_\_\_\_\_ never used
  - \_\_\_\_\_ day(s) ago
  - \_\_\_\_\_ week(s) ago
  - \_\_\_\_\_ month(s) ago
- 8. When is the last time you smoked a cigar, cigarillo, pipe or other product?
  - \_\_\_\_ less than a day ago \_\_\_\_ never used
    \_\_\_\_ day(s) ago
    \_\_\_\_ week(s) ago
    \_\_\_\_ month(s) ago

- 9. When is the last time you used snuff, chewing tobacco, spit tobacco, or other smokeless tobacco product (other than nicotine replacement patches, gum or inhalers)?
  - \_\_\_\_\_ less than a day ago \_\_\_\_\_ never used
  - \_\_\_\_\_ day(s) ago
  - \_\_\_\_\_ week(s) ago
  - \_\_\_\_\_ month(s) ago
- 10. Have you made at least one serious attempt to quit smoking since enrolling in the study?

Jason, please add note to interviewers to define "serious" "serious means that you intended to quit and you were able to stay smoke and tobacco free for at least 24 consecutive hours".

\_\_\_\_\_ YES (continue)

\_\_\_\_\_ NO (skip to Q 13)

12a. How many times did you have a quit attempt that lasted at least 24 hours? \_\_\_\_\_#

12b. What is the longest period of time that you remained smoke free?

\_\_\_\_\_ less than a day

\_\_\_\_\_ day(s)

- \_\_\_\_\_ week(s)
- \_\_\_\_\_ month(s)
- 11. Since enrolling in the study three months ago, have you used any of the following methods to help you quit smoking? (Read each response and check all that apply).

01 very helpful02 somewhat helpful03 not very helpful04 not at all helpful

- YES
   NO

   YES
   NO

   YES
   NO

   YES
   NO

   YES
   NO

   YES
   NO

   YES
   NO
- a. Self-help booklet, pamphlet, cassette or video
- b. Nicotine patch, gum or inhaler
- c. Counseling from a special program like the NICC Program, or a pre-natal program like "Healthiest Babies Possible.
- d. Brief counseling or advice from a doctor, dentist, pharmacist, nurse or other health care professional
- e. A support group like the Gator Club

YES	NO	f. Acupuncture, hypnosis or laser therapy
YES	NO	g. Zyban
YES	NO	A telephone quit line or helpline for smokers
YES	NO	h. Internet website and/or chat group
YES	NO	i. Herbal therapy
YES	NO	j. First Nations traditional healing (such as sweat
		lodge and/or healing circle
YES	NO	k .Other
(specify):		

13b of the various methods you used to help you quit, which one was most helpful?

Thank you very much for taking the time to complete this survey. Do you have any questions? [Address any questions they may have at this time].

### Appendix D

Table 10. Use of tobacco products other than cigarettes

Questions (N = 27)	Yes/No	%
Do you currently smoke cigars cigarillos or a pipe?	No	100
Do you currently use spit tobacco, chewing tobacco,	No	100
snuff or other smokeless tobacco?		
Have you used any other types of tobacco	No	100
in the last month?		

Responses to questions about tobacco use of products other than cigarettes were negative from all participants (see Table10).

## Appendix E

Table 11. Access, Cost and Tobacco Use Restrictions for First Nations Participants

Question $(N = 3)$			
How do you normally obtain your tobacco products?	Purchase S	Share or ( trade	Gift Other
Number	3	0	0 0
Where do you normally purchase tobacco products	On another reserve	Off reserve	e On your reserve
Number	0	1	2
Are cigarettes sold in your community	Yes	No	I don't know
Number	1	missing data	
Can you buy cigarettes cheaper On reserve	Yes	No	I don't know
Number	1	0	2
Is smoking permitted in the bingo hall on reserve	Yes	No	I don't know
Number	2	0	1
Is smoking permitted at the Local community hall on Reserve	Yes	No	I don't know
Number	1	1	1
Is smoking permitted at the Community hall on reserve	Yes	No	I don't know
Number	1	1	1
Are you familiar with the Sacred use of tobacco	Yes	No	I don't know
Number (N=15)	8	7	0

Table 11 contains information about First Nations participants who live in a First Nations community (on reserve). Participants who answered 'Yes" when asked if they considered themselves to be First Nations people were asked whether they live in a First Nations community (on or off reserve). The interviewer was then directed to a series of questions related to First Nations culture and community dictated by the software skip pattern. Three First Nations participants were eligible to answer the first question in Table 11. The last question was asked of all First Nations participants regardless of their residential location (N =15).