

# **First Nations Youth Smoking: Factors Associated with Resilience**



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FNIGC is a First Nations-led organization committed to gathering and disseminating data that reflects the diversity of life in the 634 First Nations reserve and Northern communities across the country. It has a mandate to oversee data collection on First Nations reserves and Northern communities, and envisions that every First Nation will achieve data sovereignty in alignment with its distinct worldview.

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## Executive Summary



The goal of this report is to identify potential protective factors against cigarette smoking among First Nations youth living on reserves and in northern communities. Historically and in present day, tobacco use has spiritual and ceremonial purposes for First Nations; however, the current prevalence of commercial tobacco use among First Nations adults and youth poses a health challenge. Though the majority—more than 70%—of First Nations youth living on reserves do not smoke, better understanding the determinants of resilience or protective factors regarding cigarette smoking amongst these youth will provide insightful knowledge that can serve to address this issue.

This report is intended to complement and build upon a 2016 First Nations Information Governance Centre (FNIGC) research paper, *Youth Resilience and Protective Factors Associated with Smoking in First Nations Communities*, which analyzed data from the First Nations Regional Health Survey (FNRHS, or RHS) Phase 2 (2008/10).

This report uses data from the youth (aged 12–17) component of FNIGC’s First Nations Regional Early Childhood, Education and Employment Survey (FNREEES), which represents information gathered in 2013 to 2015. This quantitative data is augmented with a qualitative review of select community tobacco reduction initiatives (including prevention, education, reduction, and cessation). When possible, attention is paid to the influence of sex and gender<sup>1</sup> in the data set and review. It is hoped that the results can help inform tobacco reduction initiatives (including prevention, education, reduction, and cessation) to increase healthy behaviours among First Nations youth.

It is important to place any understanding of health behaviours for First Nations youth into a historical and contemporary colonial context, most specifically the destructive impacts of the Indian Residential School (IRS) system. This was formally recognized on a national scale with the Royal Commission on Aboriginal Peoples (RCAP) and more recently, the Truth and Reconciliation Commission of Canada (TRC). Canada’s colonial history must be accounted for in any First Nations issues. Attention to the TRC’s Calls to Action can help contextualize the findings of this report and shape how they are implemented.

Quantitative analysis consisted of descriptive analyses to explore the association between potential protective and risk factors and smoking abstinence among First Nations youth on reserves, as well as domain-specific and full logistic regression models to show the relationship between these factors and smoking behaviours while controlling for other factors in the models.

The statistical analyses were complemented by qualitative data drawn from a series of interviews with key contacts for First Nations on-reserve tobacco prevention, education, reduction, and cessation initiatives.

### Key Findings

- Seven out of ten (71%) of First Nations youth aged 12 to 17 do not smoke. Of the nearly one-third (29%) who do smoke, half are daily smokers and half are occasional smokers.
- Among First Nations youth, three-quarters (75%) of males are non-smokers, while 66% of females are non-smokers.
- Four in five (79%) First Nations youth currently attending school do not smoke, while three in five (59%) youth who have dropped out of school are non-smokers.
- Including only factors that were statistically significant in the descriptive analyses and domain-specific regressions, the full logistic regression models showed six significant factors to be protective against smoking among First Nations youth: having good to excellent self-rated mental health; not binge drinking in the past year; not using drugs (illicit drugs or misusing prescription drugs) in the past year; having a father who works full time (compared to having a father who does not work for pay); not doing volunteer work in the community; and having friends who do not smoke. The latter factor had the strongest effect: Compared to youth whose friends smoke, those whose friends do not smoke have odds 18 times as high of not smoking themselves.

<sup>1</sup> In this report, “sex” and “gender” are discussed as distinct concepts: “sex” refers to biological attributes and “gender” refers to socially constructed roles, behaviours, expressions, and identities. For more detailed definitions, see the *Background* section.



- Derived from the full logistic regression model for all First Nations youth, the predicted probability of being a non-smoker for a hypothetical youth with all six protective factors found to be significant in the full model (see above) is 99.9%, while a hypothetical youth with none of the factors has a 3.9% chance of not smoking.

The interview process identified four key themes which serve to supplement and contextualize the quantitative findings:

- First, the interviews relayed that sex and gender are seldom accounted for in youth tobacco interventions.
- Second, the interviews highlighted the importance of community-specific programming because each First Nation is unique.
- Third, the influential role of the social determinants of Indigenous health was recognized.
- Fourth, cigarette smoking in many reserve communities is normalized, including among traditional community leaders and at community events.

Much of the programming that has been developed for First Nations youth in addictions and mental health generally has been grounded in Eurocentric models of risk and resiliency. It is well established that solutions to problematic substance use among First Nations youth need to be culturally specific and rooted in Indigenous and Western ways of knowing (with priority given to the former).

The *First Nations Mental Wellness Continuum Framework* (Health Canada & Assembly of First Nations [AFN], 2015) promotes the balancing of mental, physical, spiritual, and emotional wellness factors in First Nations communities in the offering of mental health and addictions programming. For First Nations youth tobacco reduction initiatives, this includes recognizing the influential roles of adults and cultural leaders as role models, and of normalized cigarette smoking within communities.





## Introduction



This report focuses on factors associated with resilience to smoking among First Nations youth (aged 12–17) living on reserves based on data from FNIGC’s First Nations Regional Early Childhood, Education and Employment Survey (FNREEES). This data was augmented with a review of select First Nations community tobacco reduction initiatives. The aim of this report is to better understand the decisions surrounding tobacco use by First Nations youth living on reserves, as today it “is vastly different from the mainly spiritual and ceremonial purposes it once served as a sacred medicine” (FNIGC, 2016, p. 2).

Drawing on data from the First Nations Regional Health Survey<sup>2</sup> (FNRHS, or RHS) Phase 2 (2008/10), FNIGC published a 2016 report titled *Youth Resilience and Protective Factors Associated with Smoking in First Nations Communities*.<sup>3</sup> This report found that the majority (66.9%) of First Nations youth were non-smokers and emphasized the importance of understanding factors that lead these youth to abstain from smoking. At the same time, the prevalence of smoking (33.1%) amongst First Nations youth living on reserves is significantly higher in comparison to First Nations youth living off reserves (Bougie & Kohen, 2018).

Attention is placed in this report in analyzing the FNREEES data (2013/15) on youth smoking behaviours from a strengths-based perspective. It is hoped that this understanding can help inform tobacco reduction initiatives (including prevention, education, reduction, and cessation) to increase healthy behaviours among First Nations youth.

FNIGC’s 2016 youth smoking report found that higher proportions of males than females were non-smokers but that, among daily smokers, females and younger youth (12–14 years old) had a lower average daily consumption than males and older youth (15–17 years old), respectively. More youth in urban First Nations communities were smokers compared to youth in rural or remote communities. Among youth who were smokers, a higher proportion of those who started at a younger age smoked daily (vs. occasionally). Among youth who quit smoking, the most common reason was for their health and it was done “cold turkey/[by] will

power alone” (FNIGC, 2016, p. 2).

Drawing from a review of the literature, the 2016 FNIGC youth smoking report examined protective and risk factors related to smoking, and found the following:

- Protective family/household characteristics include living with biological parent(s) and living in a smoke-free home.
- School attendance is a protective factor against smoking.
- Personal/individual attributes that are protective include better self-reported mental health, less loneliness, higher self-esteem and mastery,<sup>4</sup> more social support, and participation in sports or other physical activities outside of school.
- Participation in local community cultural events is a protective factor related to First Nations traditional culture.

This report focuses on the FNREEES data, which includes additional information on potential protective factors (e.g., peer behaviours, volunteer activities, school environment) in comparison to the RHS. The report augments this FNREEES data with input from key First Nations on-reserve tobacco reduction initiative managers and front-line workers, and authorities on the issue of tobacco and First Nations culture. Undertaking this review provided a more in-depth review of protective factors that promote healthy behaviours. Protective factors identified in the FNREEES helped to inform the review of best practices from community initiatives, and insights gained from community initiatives informed interpretation of the FNREEES data. Both the quantitative data and the review of initiatives offer insight for current First Nations youth on-reserve tobacco reduction initiatives and future FNIGC data collection efforts.

It is important to recognize that tobacco has important traditional spiritual and ceremonial purposes for First Nations people and is an integral part of prayers, as part of ceremonies and is given as a gift. However, its contempo-

<sup>2</sup> The RHS Phase 2 surveys First Nations youth on reserves and in northern communities. The First Nations-governed national survey gathers information about health, well-being, and their social determinants based on Western and traditional understandings. Self-reported survey data was collected between 2008 and 2010 from 4,837 youths across 216 communities (FNIGC, 2016).

<sup>3</sup> Hereafter referred to in this report as the “2016 FNIGC youth smoking report” and can be found at [https://fnigc.ca/wp-content/uploads/2020/09/9d77949af9a082da444c3e1afb8a8ab2\\_FNIGC-Research-Series-Youth-Smoking.pdf](https://fnigc.ca/wp-content/uploads/2020/09/9d77949af9a082da444c3e1afb8a8ab2_FNIGC-Research-Series-Youth-Smoking.pdf)

<sup>4</sup> A measure of how one perceives themselves as being in control of forces that significantly impact their life.



rary use by way of smoking commercially produced cigarettes poses a distinct health risk for First Nations adults and youth.

A better understanding of protective factors against cigarette smoking amongst First Nations youth will provide valuable knowledge to address this important health issue. This is important because today's youth may experience conflict between the sacred role of tobacco and Western or colonized ways of commercial tobacco use (e.g., harmful chemicals are added to the tobacco).

The approach to resiliency in this report is adopted from the 2016 FNIGC youth smoking report, in which resiliency is defined as

...one's ability to recover or adjust in the face of adversity, [and] is explored in this report through an examination of the protective factors associated with youth's reduced likelihood of engaging in smoking and other risky behaviours, and of some risk factors that increase vulnerability to participating in these behaviours. (p. 2)

Much of the programming that has been developed for First Nations youth in addictions and mental health generally has been grounded in Eurocentric models of risk and resiliency. It is well established that solutions to problematic substance use among First Nations youth need to be culturally specific and rooted in Indigenous and Western ways of knowing, with priority given to the former (Dell et al., 2011; Rowan et al., 2014).

In response, findings from the FNREEES, accompanied with the review of community initiatives, are situated within the *First Nations Mental Wellness Continuum Framework* (FNMWCF). The FNMWCF prioritizes indicators of wellness in First Nations communities, in place of a deficit approach, in the offering of mental health and addictions programming. The FNMWCF was jointly developed by Health Canada's First Nations and Inuit Health Branch, the Assembly of First Nations, and Indigenous mental health leaders from various First Nations non-government organizations. According to the framework document,

Mental wellness is a balance of the mental, physical, spiritual, and emotional. This balance is enriched as individuals have: **purpose** in their daily lives whether it is through education, employment, care-giving activities, or cultural ways of being and doing; **hope** for their future and those of their families that is grounded in a sense of identity, unique Indigenous values, and having a belief in spirit; a sense of **belonging** and connectedness within their families, to community, and to culture; and finally a sense of **meaning** and an under-

standing of how their lives and those of their families and communities are part of creation and a rich history. (Health Canada & AFN, 2015, p. iv)

## Background

The 2016 FNIGC youth smoking report undertook a thorough review of the First Nations and Western youth smoking literature, with a specific focus on protective factors. It found that "[t]here are large bodies of literature on youth smoking, resilience, and risk/protection factors, but relatively little information is available on resilience to smoking among First Nations youth living on-reserve" (FNIGC, 2016, p. 3). Further, it concluded that "most of the findings in this report do not differ significantly from those in the existing literature, except for those regarding traditional culture and language indicators" (p. 3).

The 2016 FNIGC youth smoking report shaped the structure of this one, with examination undertaken of family and household characteristics, school and peer factors, personal and individual attributes, and First Nations traditional culture. Two supplementary areas are addressed in this report: linkage with the recent Truth and Reconciliation Commission (TRC) Calls to Action, and implications of accounting for sex and gender.

## Truth and Reconciliation Commission of Canada Calls to Action

It is important to place any understanding of health behaviours for First Nations youth into a historical and contemporary colonial context, and most specifically the destructive impacts of the Residential School system. This was formally recognized on a national scale with the Royal Commission on Aboriginal Peoples (Government of Canada; Indigenous and Northern Affairs Canada; Communications Branch, 2010).

More recently, the TRC built on this and "was a commission like no other" (2015a, p. v). The TRC "spent six years travelling to all parts of Canada to hear from the Aboriginal people who had been taken from their families as children, forcibly if necessary, and placed for much of their childhoods in residential schools" (p. v). To move forward in a good way, recognition of the past must take place and by all Canadians. As the TRC final report summary states:

Getting to the truth was hard, but getting to reconciliation will be harder. It requires that the paternalistic and racist foundations of the residential school system be rejected as the basis for an ongoing relationship. Reconciliation requires that a new vision, based on a commitment to mutual respect, be developed. It also



requires an understanding that the most harmful impacts of residential schools have been the loss of pride and self-respect of Aboriginal people, and the lack of respect that non-Aboriginal people have been raised to have for their Aboriginal neighbours. Reconciliation is not an Aboriginal problem; it is a Canadian one. Virtually all aspects of Canadian society may need to be reconsidered. (TRC, 2015a, p. vi)

It is necessary that this report recognize this. The 94 Calls to Action from the TRC can help contextualize the report findings and shape how they are implemented. Specific attention should be made to the following:

#18: We call upon the federal, provincial, territorial, and Aboriginal governments to acknowledge that the current state of Aboriginal health in Canada is a direct result of previous Canadian government policies, including residential schools, and to recognize and implement the health-care rights of Aboriginal people as identified in international law, constitutional law, and under the Treaties.

#19: We call upon the federal government, in consultation with Aboriginal peoples, to establish measurable goals to identify and close the gaps in health outcomes between Aboriginal and non-Aboriginal communities, and to publish annual progress reports and assess long-term trends. Such efforts would focus on indicators such as: infant mortality, maternal health, suicide, mental health, addictions, life expectancy, birth rates, infant and child health issues, chronic diseases, illness and injury incidence, and the availability of appropriate health services. (TRC, 2015b, p. 2–3)

## Sex and gender

The breadth of empirical literature is growing in support of the idea that there are sex differences in the health impact of tobacco and gendered influences, pathways, and responses to interventions for females to substance use, including tobacco, in comparison to males. For example, the risk of smoking-related diseases is higher among females compared to males because of hormonal differences and women's smaller airways and lung volumes. These sex differences mean the risk for cardiovascular disease, lung and other cancers differ in type and severity for women who use tobacco (Chen et al., 2014; Huxley & Woodward, 2011; Johnson et al., 2009; Lee et al., 2011).

Women's reproductive health and the negative effect of tobacco use on fetal and child health are important issues. Exposure to tobacco smoke (or cannabis smoke) is a significant health concern, as exposure to second-hand smoke

is a known risk for breast cancer, asthma, and cardiovascular disease in girls and women. In addition, women have been shown to be more likely than men to smoke to control negative mood and emotions (Greaves & Poole, 2007) and men's smoking has been linked to expression of masculine identity (Bottorff et al., 2014).

While the tobacco advertising industry has paid significant attention to gender-based differences in smoking behaviours, too often tobacco researchers and health promotion, prevention, and treatment workers have not adequately factored in sex and gender-based analysis or sex/gender-informed approaches, beyond the focus on pregnant smokers (Dell, 2007).

According to the Canadian Institutes of Health Research (2015),

Sex refers to a set of biological attributes in humans and animals. It is primarily associated with physical and physiological features including chromosomes, gene expression, hormone levels and function, and reproductive/sexual anatomy. Sex is usually categorized as female or male but there is variation in the biological attributes that comprise sex and how those attributes are expressed.

Gender refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people. It influences how people perceive themselves and each other, how they act and interact, and the distribution of power and resources in society. Gender is usually conceptualized as a binary (girl/woman and boy/man) yet there is considerable diversity in how individuals and groups understand, experience, and express it. (para. 1–2)

Sex and gender are examined in this report given its quantitative focus (analysis includes a sex variable) as well as its review of community initiatives (which includes discussion of tobacco use in relation to sex and gender issues). The Centre of Excellence for Women's Health explains that "sex related factors affect the biological responses to nicotine, tobacco use and treatments, and gendered factors such as social, cultural and economic norms, relationships and opportunities affect smoking initiation, patterns of use, cessation and responses to tobacco policies, for men, women, boys and girls" (Centre of Excellence for Women's Health, 2018, p. 1).

There is limited research specific to women and girls in the addictions field generally, and even less specific to tobacco, and that which exists specific to First Nations females and tobacco is extremely limited. However, in the relevant literature, it is recognized that an individual's gender, alongside



their culture, intersects with other factors to shape their experiences with tobacco use. A qualitative study of adolescent females and smoking in Aboriginal communities in British Columbia states,

While the girls who participated in this study are incredibly diverse, they also share common experiences—sexism, racism, ageism, among other structural barriers—that shape risk factors for smoking. It is critical that prevention and cessation strategies not place the blame for structural inequities on Aboriginal girls and their communities. (De Finney et al., 2009, p. 27)

This study of the social, cultural, and gender context of Aboriginal girls' smoking also notes,

Girls who identified as smokers or former smokers described four main contexts in which their smoking began and continued: experimentation and boredom; relational and peer pressures; drinking and partying; and stress relief. Among the stressors girls identified were gender inequities that placed more expectations for care-giving and domestic work on them compared to boys. While girls reported a mix of cultural influences and varying strengths of identification with their

diverse Aboriginal backgrounds, girls who smoked generally expressed less knowledge about their Aboriginal backgrounds and local community cultural context. The complex interrelated influences of social context, gender, and cultural background indicate that smoking prevention programs for Aboriginal girls need to be tailored to community needs and address girls' calls for girl- and culture-centred supports. (De Finney et al., 2013, p. 151)

While establishing the unique experiences of First Nations females, it must also be recognized that a First Nations worldview may not coincide with a binary Western worldview of Christian colonizers. For example, First Nations frequently include two-spirited individuals, and for some it is not useful to separate between males and females because community is seen as interrelated, comprised of individuals, animals, and the environment, including spirit (Robinson, 2017). Recognizing this, this report does address sex and gender because there is enough evidence to support that currently the majority of First Nations are impacted by European imposed gender categories on how they experience their everyday lives.





## Methods



### Survey

The data used to analyze the protective and risk factors associated with youth tobacco use are from the First Nations Regional Early Childhood, Education and Employment Survey (FNREEES). FNREEES was conducted between 2013 and 2015 by FNIGC in cooperation with its Regional Partners and is representative of the population of First Nations youth living on reserves and in northern communities across Canada. The analyses in this paper use self-reported data from 3,842 youth, aged 12 to 17, drawn from the youth component of the survey. Surveys were typically self-administered in the home using customized computer-assisted personal interviewing (CAPI) software on laptop computers, although fieldworkers were present to offer assistance or translation as needed.<sup>5</sup>

### Variables

The variables included in the following analyses are grouped into seven categories or domains of protective and risk factors: individual, other health behaviours, family, peer related, school related, traditional culture, and sense of well-being.

The composite measures in this report are computed, based on the questions answered, for youth who answered at least one of the questions included in the measure. For example, if the respondent answered only one of the included questions, the single response is used, and if the respondent answered two of the included questions, the mean of those two responses is used; a similar calculation method is conducted for respondents who answered up to the maximum number of questions included in the composite measure.

### Youth Smoking Behaviours

Youth were asked, “At the present time do you smoke cigarettes daily, occasionally, or not at all?” “Occasional” smokers smoke more than “not at all” but less than “daily”, so this can encompass a broad range of youth who may smoke anywhere between a few times a week or a few times a year. In most of the analyses, youth who reported that they smoke daily or occasionally are grouped together because of the relatively small sample sizes compared to those who do not

presently smoke. Since the survey question refers to current smoking behaviours, past smoking behaviour cannot be identified, and those who do not presently smoke may have smoked in the past. Occasional or daily smokers were also asked the age at which they began smoking.

### Individual Factors

Seven individual factors are examined in this report. Sex is treated dichotomously as a youth’s self-report of whether they are male or female. For the bivariate analyses, age is grouped into three categories representing youth aged 12 to 13, 14 to 15, and 16 to 17. In the multivariate analyses, age is collapsed into two categories for youth aged 12 to 14 and 15 to 17.

School status is classified into three categories that distinguish between youth who are currently in school, those who have completed school, and those who have left school without graduating. Respondents were asked if they “volunteer or help without pay in the community” with possible responses of yes and no. Respondents are categorized as working or not working based on their response to the question, “Are you currently working at a job or business for pay (wages, salary, self-employed):”

The remaining two individual factors are measures constructed by combining responses to several questions. Positive attitudes about postsecondary education are measured through five statements with which respondents were asked to state whether they strongly disagree, disagree, agree, or strongly agree. The following statements are included in the measure:

- Getting a good job later in life depends on my success in school.
- I will need to go to college or university to achieve what I want in life.
- I think I would enjoy going to college or university.
- I think I would do well in college.
- I think I would do well in university.

Responses to these statements are averaged and the final measure ranges from one to four with a higher value indicating a more positive attitude towards postsecondary

<sup>5</sup> More information on the sample and methodology is available at [https://fnigc.ca/wp-content/uploads/2020/09/fnigc\\_fnreees\\_national\\_report\\_2016\\_en\\_final.pdf](https://fnigc.ca/wp-content/uploads/2020/09/fnigc_fnreees_national_report_2016_en_final.pdf)



education. Level of mastery is similarly constructed. Responses about whether the youth strongly disagrees, disagrees, agrees, or strongly agrees with seven statements are averaged to create a scale that ranges from one to four. This measure is based on the Pearlin Mastery Scale (Bureau of Labor Statistics, n.d.), with some slight wording modifications. The statements included in the level of mastery measure are as follows:

- ✦ I can solve the problems that I have.
- ✦ No one pushes me around in life.
- ✦ I have control over the things that happen to me.
- ✦ I can do just about anything I set my mind to.
- ✦ I often feel helpless in dealing with the problems in my life (responses were reverse coded).
- ✦ What happens to me in the future mostly depends on me.
- ✦ There is little I can do to change many of the important things in my life (reverse coded).

### **Other Health Behaviours**

Five variables on other health behaviours around substance use are included in the analyses. Binary variables for whether the respondent drank alcohol, drank five or more drinks in one sitting (binge drinking), used marijuana, misused prescription drugs,<sup>6</sup> or used other illicit drugs in the past year are included in the binary analyses. In the multivariate analyses, all types of drug use (marijuana, prescription misuse, and illicit drugs) are collapsed into a single binary drug use variable.

### **Family Factors**

Eight family-related factors are included. Dichotomous measures of whether youth live in a smoke free home or not and whether they have ever been in foster care are included. Family structure is classified into three categories including living with two biological parents, one biological parent, or any other family structure including extended, foster, adopted, and stepfamilies. A measure for whether the youth has a family member who attended a Residential School was created by combining questions about whether the respondent's mother, father, sibling, or any grandparent attended Residential School. A "crowded" home is classified as a home with more people living in it than the number of rooms it has, and "not crowded" otherwise.

A youth's mother and father's employment is categorized into full time, part time, not working for pay, and parent(s') employment status is unknown. Parental education is classified into four categories: both parents have less than a high school education, at least one parent has a high school diploma, at least one parent is educated beyond high school, and parental education is unknown or not applicable (i.e., parent is not in the youth's life). Parental education and employment were the only indicators for which missing responses were included in the analyses, as a large proportion of youth respondents did not know the answers.

### **Peer Factors**

Measures for the substance-related health behaviours of the respondents' friends include dichotomous measures for whether the youth has no friends who smoke compared to those who report that some, most, or all of their friends smoke. Peer drinking and peer drug use measures are created in the same way.

### **School factors**

School-related factors are included in the analyses for respondents who are currently enrolled in school. The number of times a respondent has changed schools (for reasons other than ordinary progression) is coded into never, once to three times, and four times or more.

Binary measures for whether the respondent was ever taught a First Nations language in school, or whether they ever had a First Nations teacher, are included. Academic grades are coded into two categories: mostly As and Bs, and mostly Cs or lower. Respondents were asked to indicate whether they strongly agree, agree, disagree, or strongly disagree to the statement, "The presence of drugs is a problem at school." Responses are collapsed into agree and disagree. The same approach is used for the measure of whether there is a perceived alcohol problem at school. A binary measure for whether the respondents' parents attended a school event in which they (the youth) participated is also included.

Responses to four questions are combined to create a composite measure of how positive a school climate is. Students were asked to strongly disagree, disagree, agree, or strongly agree to the following four statements:

- ✦ Overall, I feel safe at school.
- ✦ Overall, I am happy at school.

<sup>6</sup> Examples of prescription drug misuse include taking them without a prescription, taking more than prescribed, taking them longer than prescribed, and tampering with prescribed medication (e.g., crushing tablets).



- Most of the students enjoy being there.
- My school supports First Nations culture.

Responses to these four questions are averaged and the final measure ranges from one to four, with higher values indicating a more positive school climate.

Negative school climate is measured in a similar way, averaging the responses to the following three statements:

- Racism is a problem at school.
- Bullying (physical, emotional) is a problem at the school (including cyber-bullying).
- Physical violence is a problem at school.

Responses to these three questions are averaged and the final measure ranges from one to four, with higher measures indicating a more negative school climate.

The extent to which the respondent has a personally positive experience at school is measured by averaging the responses to ten questions:

- I have enough friends at school.
- I am involved in school activities.
- I am friendly towards others at school.
- I cooperate well with others at school.
- I trust people at school.
- I like to join in.
- I like jokes and having fun.
- I laugh a lot at school.
- I enjoy coming to school.
- People at school generally like me.

Responses to these ten questions are averaged and the final measure ranges from one to four, with higher values indicating a more positive school experience.

### ***First Nations Traditional Culture***

Binary measures of cultural factors that reflect the importance and knowledge of traditional culture are included in the analyses. Whether respondents have any knowledge of a First Nations language is included. Respondents were also asked how much they knew about the history of their people, the inherent rights of their people, and the history of Indian Residential Schooling. The responses to these questions are categorized into “nothing/a little” knowledge or “some/a lot” of knowledge.

Respondents were asked to rate how important learning a First Nations language was to them; the importance of knowing and learning about traditional teachings (“e.g., beliefs, values, medicines, practices, ceremonies, stories, songs, activities”); and how satisfied they were with their knowledge of traditional teachings. The responses to these questions are categorized into two categories: “not or a little” as well as “very or somewhat” important/satisfied.

Whether respondents participated in any First Nations cultural activities (“e.g., drumming, singing, storytelling, powwow, traditional dancing, hunting and gathering, beading, ceremonies”) is also included in the analyses as a binary measure.

### ***Well-being Factors***

Eleven measures of well-being are included in the analyses. Youth's self-reported physical health is classified into two categories consisting of “excellent/very good/good” and “fair/poor.” Their self-reported mental health is grouped into two categories including “excellent/very good/good,” and “fair/poor.”

Whether respondents ever felt sad, blue, or depressed for two weeks or more in a row in the past year is included as a binary measure. Respondents were also asked whether they felt lonely, loved, or stressed. The responses to each of these three questions are categorized into “not at all/a little” or “moderately/quite a bit.”

Respondents were asked whether they had a consistent sleep schedule and ate a nutritious balanced diet. The responses to these questions are categorized into “never/sometimes” or “most of the time/always.” Whether respondents participated in a sport or physical activity outside of class at least once a week is also included.

Respondents were asked how often they feel in balance in four aspects of their life including physical, mental, emotional, and spiritual. Youth were given the response options of “all of the time,” “most of the time,” “some of the time,” “almost none of the time” or “none of the time.” Responses to these four questions are averaged to create an overall balance measure that ranges from one to five, with higher values signifying greater balance.

The variable measuring the amount of social support available to the respondent ranges from one to four (with the higher value signifying more social support) and is constructed by averaging the level of agreement with the following statements:



- If something went wrong, no one would help me (reverse coded).
- I have family and friends who help me feel safe, secure, and happy.
- There is someone I trust whom I would turn to for advice if I were having problems.
- There is no one I feel comfortable talking with about problems (reverse coded).
- There are people I can count on in times of trouble.

## Statistical Analysis

Estimates are weighted to be representative of the First Nations youth population living on reserves and in northern communities using the SPSS Complex Samples Module. The module produces estimates based on the complex sampling design of the FNREEES. The following analyses exclude missing responses (i.e., don't know, refused, and not applicable) unless otherwise stated.

For statistical reliability, the estimates with a coefficient of variation (CV) between 16.6% and 33.3%, reflecting moderate to high sampling variability, are displayed with an 'E' to advise that caution should be used when interpreting the results. In the bivariate descriptive analyses, the difference between groups or categories is tested based on the adjusted F-statistic (not shown). The adjusted F is a variant of the second-order Rao-Scott adjusted chi-square statistic.

The analysis begins with a series of cross-tabulations of the various risk and protective factors and smoking behaviour. Next, a series of seven logistic regression models are estimated that compare the predicted probability of being a non-smoker, one for each of the protective and risk factor domains. These models include only those variables found to be significantly associated with smoking behaviours in the bivariate analyses. Next, a full logistic regression model that includes all of the protective and risk factors that are significant in the domain-specific regression models examines the unique effects of each factor, while controlling for other youth characteristics.

Logistic regression is similar to traditional linear regression techniques, except that the dependent variable is a dichotomous variable; for example, not smoking vs. smoking. As such, logistic regression is used to predict the probability of one of the outcomes, compared to the other based on one or more independent variables. Odds ratios are a common and popular way to interpret the effects of specific independent variables on the probability of a dichotomous dependent variable outcome (e.g., not smoking). The odds ratio

can be interpreted as follows:

- When odds ratio is significantly less than 1, the odds of being a non-smoker are lower for that group than for the reference group.
- When odds ratio is equal to 1, the odds of being a non-smoker are the same for that group as for the reference group.
- When odds ratio is significantly greater than 1, the odds of being a non-smoker are higher for that group than for the reference group.

Finally, drawing from the full multivariate logistic regression model, the predicted probabilities of being a non-smoker for a series of hypothetical youth with various combinations of protective and risk characteristics are presented.

## Qualitative Analysis: Community Tobacco Reduction Initiatives

To complement the FNREEES quantitative data analysis, interviews were held with eight key First Nations on-reserve tobacco reduction initiative managers and front-line workers and authorities in the field of tobacco and culture. The majority (six) of the interviews were held after the preliminary findings of the quantitative data analysis were identified. This allowed for questions specific to these findings to be asked in the interviews.

The contacts for the interviews were "snowball" sampled,<sup>7</sup> starting with the Thunderbird Partnership Foundation (TPF). The TPF's mandate is to be "the national voice advocating for Inuit and First Nations culturally-based addictions services" (Thunderbird Partnership Foundation, 2018a, para. 5). The TPF identified two experts connected to their organization in the area of tobacco reduction, and each was contacted to identify key community-based initiatives involved in cigarette smoking prevention, reduction and/or cessation. The individuals interviewed included program managers, front-line workers, and subject matter experts.

The initiatives reviewed variously addressed the smoking prevention, reduction, or cessation in their operations (noting limited attention to reduction specifically). The interviews covered various remoteness categories, including rural, remote, and close-to-urban settings, but are in no way nationally representative of reserves and northern communities across Canada. Common amongst the interviews was a solid understanding of tobacco and its sacred and contemporary use amongst youth and/or the role of

<sup>7</sup> A sampling technique where research participants identify additional participants from their network.



traditional First Nations culture in individual and community health.

A 2015 report by the Canadian Partnership Against Cancer (CPAC), titled *Leading Practices in First Nations, Inuit and Métis Smoking Cessation Program Scan*, “provides information on current practices in smoking cessation programs developed by, with, and for First Nations, Inuit and Métis across Canada by jurisdiction” (CPAC, 2015, slide 2). Noting that it is an adult focussed report, it concluded that “[r]elatively few smoking cessation programs developed by, with, and for First Nations, Inuit, or Metis exist in Canada” (CPAC, 2015, slide 24). The same is true for First Nations youth, including the areas of prevention and reduction, with the exception of mainly Health Canada-funded tobacco reduction projects.

The following overarching questions were addressed through a structured interview:

1. Do the protective and risk factor preliminary findings from the FNREEES analysis apply to the community programs?
2. Are any additional protective and risk factors for understanding youth smoking identified in the community programs?
3. What individualized (community-specific) program approaches are applied (e.g., culture, gender)?

The specific interview questions consisted of the following:

1. Describe the program or programs you are generally familiar with.
2. Describe ‘common’ program participants or youth generally, regarding uptake of smoking.
3. What is the cultural foundation of the program or programs generally (e.g., developed by, for, and with First Nations)?
4. What specific factors lead to commercial tobacco reduction or cessation?
5. Do you have any additional thoughts on the key findings I shared with you from preliminary analysis of the quantitative data for this report?

The average length of the interviews was 35 minutes. All answers were recorded in verbatim format for select sentences and at other times in a summary format (when verbatim was not possible) by typing directly into a word processing program. All interviews were reviewed upon completion for general, overarching themes.







# Results

## Descriptive Statistics

### Youth Smoking Behaviours

The majority (70.6%) of First Nations youth reported not smoking at the time of the survey (95% CI [66.7, 74.1]), 14.6% reported smoking occasionally (95% CI [11.4, 18.4]), and 14.9% reported smoking daily (95% CI [12.1, 18.1]) (see Figure 1). A look at smoking behaviours by sex demonstrates that males are more likely to be non-smokers than females, with 75.1% of males reporting they were

non-smokers (95% CI [70.9, 78.9]) compared to 65.6% of females (95% CI [59.1, 71.7]) (see Figure 2).

Female First Nations youth are more likely than males to smoke occasionally or daily: 16.0% of females report smoking daily (95% CI [11.7, 21.5]) compared to 13.8% of males (95% CI [11.1, 17.2]), while 18.4% of females report smoking occasionally (95% CI [13.2, 24.9]) compared to 11.0% of males (95% CI [8.2, 14.6]). The sex difference in smoking behaviour is statistically significant ( $p < 0.05$ ).

Figure 1. Current smoking behaviours among First Nations youth

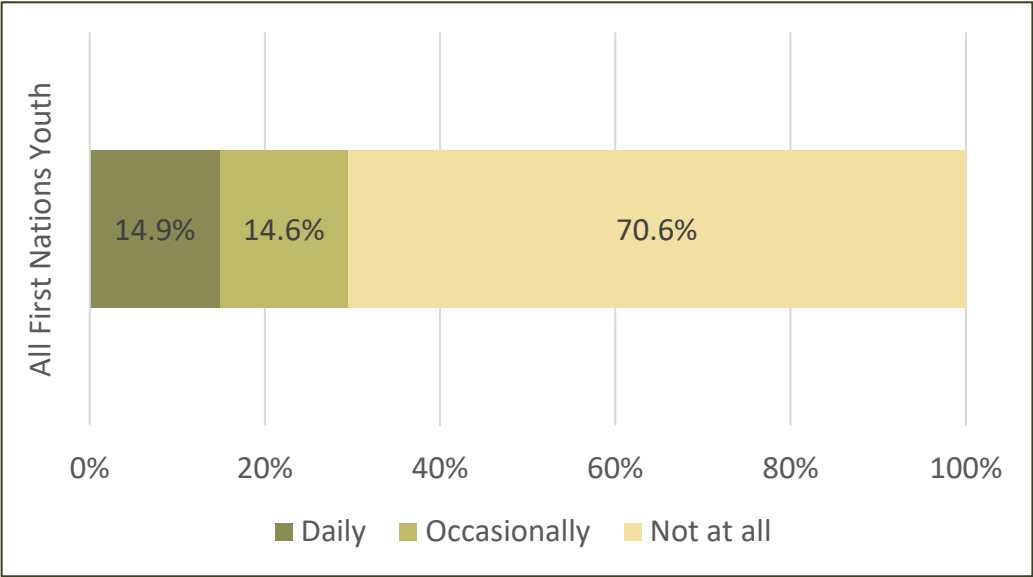
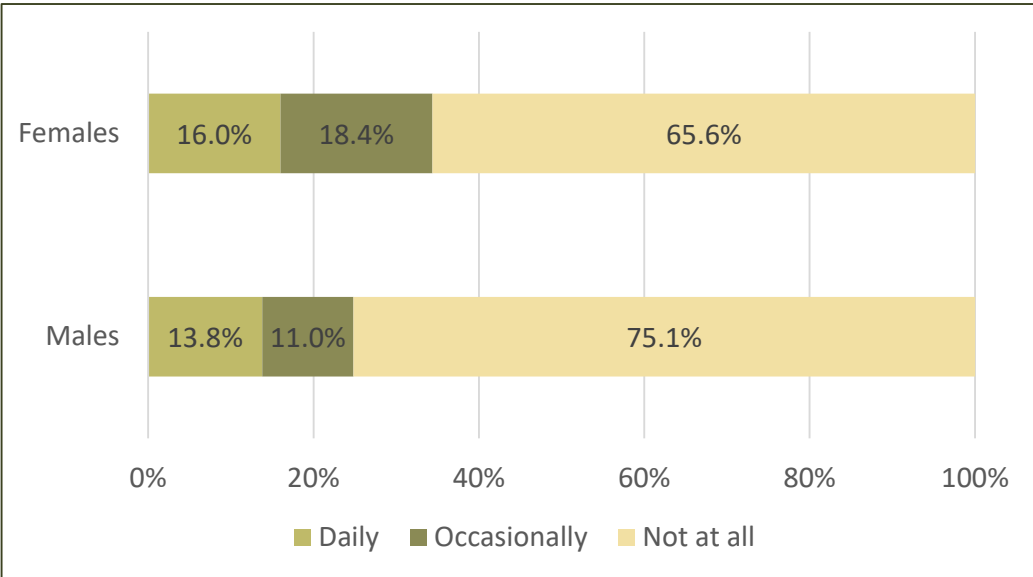


Figure 2. Smoking behaviours among First Nations youth, by sex



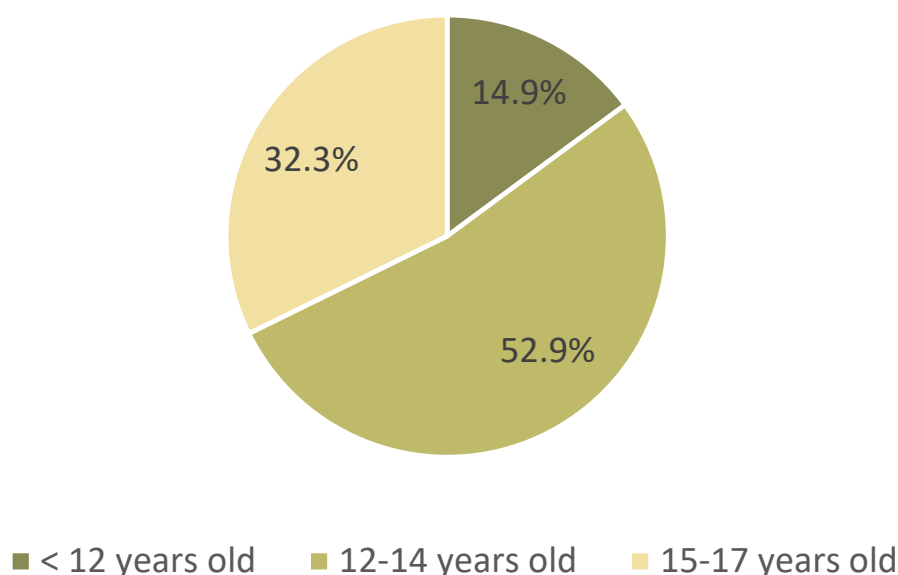


The categories of occasional and daily smoking are combined in the following analyses because of their relatively small sizes. In the remainder of the report, smoking refers to either daily or occasional smoking. Also note that the smoking behaviour variable captures smoking behaviour at the time of the survey and does not capture possible smoking behaviour among First Nations youth prior to the survey.

As shown in Figure 3, among all First Nations youth who

smoke, more than half (52.9%) started smoking between age 12 and 14 (95% CI [46.9, 58.8]). A smaller proportion (32.3%) began smoking between age 15 and 17 (95% CI [26.8, 38.3]) and only 14.9% began smoking before age 12 (95% CI [11.9, 18.4]). However, these results should be interpreted with caution because only those who currently smoke were asked this question. As a result, this analysis misses smoking onset that may occur after the survey date and the age smoking started for former smokers.

**Figure 3. Age began smoking among currently smoking First Nations youth**



### **Individual Factors**

Tables 1 and 2 display descriptive statistics and 95% confidence intervals for individual factors and smoking behaviour of First Nations youth.

Smoking is more common among older youth than younger youth. The vast majority (92.6%) of youth age 12 to 13 do not smoke. Among youth age 14 to 15, 72.8% are non-smokers and 54.7% of those aged 16 to 17 do not smoke. Age differences in smoking behaviour are statistically significant ( $p < 0.001$ ).

Smoking behaviours differ significantly based on whether youth are in school, have left school before graduation, or have graduated ( $p < 0.001$ ). Youth who are currently in school are the least likely to smoke (78.6% are non-smokers), those who have left school before graduation are the most likely to smoke (59.0% are non-smokers), and those who have finished high school fall in between with 69.1% not smoking.

Youth who volunteer without pay in their communities are more likely to smoke than youth who do not participate in any volunteer activities. Among those who volunteer, 63.0% are non-smokers and among those who do not volunteer, 75.4% are non-smokers. This difference is statistically significant ( $p < 0.001$ ).

Youth smoking behaviour does not differ significantly based on current employment status. On average, youth who work for pay and those who do not are equally likely to be non-smokers.

Youth who do not smoke report more positive attitudes about the value of a postsecondary education than youth who smoke and this difference is statistically significant ( $p < 0.001$ ). Youth who do not smoke also report a higher sense of mastery than youth who smoke; this means that, on average, non-smokers score statistically significantly higher on a composite measure of how in control they feel of their lives ( $p < 0.001$ ).



**Table 1. First Nations youth smoking by individual factors**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Sex	Male	24.9 [21.1, 29.1]	75.1 [70.9, 78.9]	*
	Female	34.4 [28.3, 40.9]	65.6 [59.1, 71.7]	
Age	12-13 years old	7.4 <sup>E</sup> [4.6, 11.8]	92.6 [88.2, 95.4]	***
	14-15 years old	27.2 [23.3, 31.5]	72.8 [68.5, 76.7]	
	16-17 years old	45.3 [38.8, 51.8]	54.7 [48.2, 61.2]	
School Status	In school	21.4 [18.2, 25.0]	78.6 [75.0, 81.8]	***
	Completed school	30.9 <sup>E</sup> [21.4, 42.3]	69.1 [57.7, 78.6]	
	Left school	41.0 [34.6, 47.7]	59.0 [52.3, 65.4]	
Volunteering in Community	Volunteer	37.0 [30.1, 44.5]	63.0 [55.5, 69.9]	***
	Don't volunteer	24.6 [21.1, 28.5]	75.4 [71.5, 78.9]	
Employment Status	Work for pay	36.2 [28.1, 45.1]	63.8 [54.9, 71.9]	n.s.
	Don't work for pay	43.4 [37.1, 50.0]	56.6 [50.0, 62.9]	

Notes: \*\*\* p&lt;0.001 \*\* p&lt;0.01 \* p&lt;0.05

Non-significant differences indicated by n.s.

<sup>E</sup> indicates high sampling variability, interpret with caution



**Table 2. First Nations youth smoking by attitude toward postsecondary education and mastery**

Variable	Smoking Ave. [95% CI]	Non-Smoking Ave. [95% CI]	Sig.
Positive attitude toward postsecondary education	3.06 [3.00, 3.12]	3.22 [3.19, 3.26]	***
Level of Mastery	2.70 [2.65, 2.76]	2.88 [2.85, 2.91]	***

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
For each composite measure, the range is 1–4

### Other Health Behaviours

Table 3 shows the bivariate relationships between smoking behaviour and other substance-related health behaviours for First Nations youth.

Youth smoking behaviours are strongly associated with other substance-related health behaviours including drinking, marijuana use, prescription drug misuse, and other illicit drug use. All of these differences are statistically significant

( $p < 0.001$ ). The vast majority of youth who report that they did not have an alcoholic beverage in the last 12 months are non-smokers (85.9%) while only 37.2% of those who did drink alcohol in the past year are non-smokers. An additional protective factor for youth is abstaining from binge drinking: the majority of youth drinkers who report that they did not consume five or more alcoholic beverages on at least one occasion in the past year are non-smokers (84.4%) while 37.6% of those who reported binge drinking are non-smokers.

**Table 3. First Nations youth smoking by other health behaviours**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Alcohol Consumption	No drinking in past year	14.1 [10.5, 18.6]	85.9 [81.4, 89.5]	***
	Drank alcohol in past year	62.8 [55.7, 69.3]	37.2 [30.7, 44.3]	
Binge Drinking	No binge drinking in past year	15.6 [12.2, 19.9]	84.4 [80.1, 87.8]	***
	Binge drank in past year	62.4 [55.0, 69.2]	37.6 [30.8, 45.0]	
Marijuana Use	No marijuana use in past year	11.3 <sup>E</sup> [6.2, 19.7]	88.7 [80.3, 93.8]	***
	Used marijuana in past year	55.8 [50.2, 61.1]	44.2 [38.9, 49.8]	



Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Prescription Drug Mis-use	No prescription drug mis-use in past year	26.8 [22.9, 31.1]	73.2 [68.9, 77.1]	***
	Misused prescription drugs in past year	69.8 [62.6, 76.1]	30.2 [23.9, 37.4]	
Illicit Drug Use	No other illicit drug use in past year	26.4 [22.5, 30.7]	73.6 [69.3, 77.5]	***
	Other illicit drug use in past year	82.8 [75.7, 88.2]	17.2 <sup>E</sup> [11.8, 24.3]	

Notes: \*\*\* p<0.001 \*\* p<0.01 \* p<0.05

<sup>E</sup> indicates high sampling variability, interpret with caution

Youth who report never using marijuana in the past year are very unlikely to smoke: 88.7% are non-smokers. Among youth who used marijuana in the past year, 44.2% are non-smokers.

Among youth who did not misuse prescription drugs in the past year, 73.2% do not smoke. Among those who misused prescription drugs, 30.2% are non-smokers.

Youth who report using illicit drugs including cocaine,

speed, or solvents in the past year are more likely to smoke than youth who do not use these drugs: 17.2<sup>E</sup>% of those who used drugs are non-smokers compared to 73.6% of those who did not use drugs.

### Family Factors

Table 4 displays crosstabulations of smoking behavior and a variety of family-related factors for First Nations youth.

**Table 4. First Nations youth smoking by family factors**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Smoking in Home	Live in a smoke-free home	24.9 [20.7, 29.7]	75.1 [70.3, 79.3]	***
	Smoking in home	36.4 [30.6, 42.6]	63.6 [57.4, 69.4]	
Live with Biological Parents	Live with 2 biological parents	26.2 [19.6, 34.0]	73.8 [66.0, 80.4]	n.s.
	Live with 1 biological parent	28.6 [23.8, 34.0]	71.4 [66.0, 76.2]	
	Other family structure	38.2 [28.8, 48.6]	61.8 [51.4, 71.2]	



Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Foster Care	Never been in foster care	28.1 [24.5, 32.0]	71.9 [68.0, 75.5]	*
	Ever been in foster care	41.4 [29.6, 54.2]	58.6 [45.8, 70.4]	
Family Residential School Attendance	No family members attended Residential School	18.2 [13.6, 23.8]	81.8 [76.2, 86.4]	***
	At least one family member attended Residential School	33.5 [27.9, 39.6]	66.5 [60.4, 72.1]	
Household Crowding	Home is not crowded	21.3 [18.2, 24.8]	78.7 [75.2, 81.8]	***
	Live in a crowded home	38.1 [31.4, 45.4]	61.9 [54.6, 68.6]	
Mother's Employment Status	Mother works full time	27.5 [22.1, 33.6]	72.5 [66.4, 77.9]	n.s.
	Mother works part time	26.1 [19.1, 34.5]	73.9 [65.5, 80.9]	
	Mother doesn't work for pay	31.2 [25.1, 38.0]	68.8 [62.0, 74.9]	
	Don't Know/Not Applicable/Refused	37.2 [30.5, 44.4]	62.8 [55.6, 69.5]	
Father's Employment Status	Father works full time	17.2 [14.4, 20.5]	82.8 [79.5, 85.6]	***
	Father works part time	25.6 [19.9, 32.3]	74.4 [67.7, 80.1]	
	Father doesn't work for pay	41.3 [32.2, 51.0]	58.7 [49.0, 67.8]	
	Don't Know/Not Applicable/Refused	36.7 [29.7, 44.3]	63.3 [55.7, 70.3]	



Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Parental Education	Both parents less than high school	33.9 [27.3, 41.3]	66.1 [58.7, 72.7]	***
	At least one parent high school graduate	18.7 [14.9, 23.3]	81.3 [76.7, 85.1]	
	At least one parent more than high school	22.1 [17.6, 27.3]	77.9 [72.7, 82.4]	
	Don't Know/Not Applicable/Refused	41.5 [32.7, 50.8]	58.5 [49.2, 67.3]	

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
Non-significant differences indicated by n.s.

Living in a smoke-free home is strongly associated with non-smoking among First Nations youth. Among those who live in a smoke-free home, 75.1% do not smoke, compared to 63.6% of those who do not live in a smoke-free home. This difference is statistically significant ( $p < 0.001$ ).

This analysis found that the family structure of First Nations youth is not significantly related to smoking behaviour: Youth who live in families with two biological parents, one biological parent, or any other family form are equally likely, on average, to be non-smokers.

Youth who have not had experience in foster care are more likely to be non-smokers than youth who have been in foster care ( $p < 0.05$ ): 71.9% of youth with no foster care experience are non-smokers, compared to 58.6% of youth who have been in foster care.

Family experience of the Residential School system is significantly associated with youth smoking behaviours ( $p < 0.001$ ). Among youth who had at least one family member (i.e., parent, grandparent, sibling) attend Residential School, 66.5% do not smoke. Among youth with no family experience of residential school, 81.8% do not smoke.

Youth living in crowded houses are less likely to be non-smokers (61.9%) than youth living in houses that are not crowded (78.7%). This difference in smoking behaviours is statistically significant ( $p < 0.001$ ).

Youth smoking behaviour is significantly related to their father's employment status ( $p < 0.001$ ). Youth whose fathers work full time are the least likely to smoke (82.8% are non-smokers), and those whose fathers do not work for pay are the most likely to smoke (58.7% are non-smok-

ers). Of youth with fathers who work part time, 74.4% are non-smokers, and 63.3% of youth who did not know or did not answer the question are non-smokers. Youth smoking behaviour is not statistically significantly related to mother's employment status.

Youth whose most highly educated parent has a high school diploma are the most likely to be non-smokers (81.3%) compared to 77.9% of youth with at least one parent who is educated beyond high school, 66.1% of youth whose parents do not have a high school diploma, and 58.5% who either did not know the educational status of their parent(s) or indicated it was not applicable (i.e., parent is not in the youth's life).

## Peer Factors

Table 5 displays the bivariate relationships between First Nations youth smoking behaviours and the substance-related health behaviours of their peers.

Youth smoking behaviours are strongly related to the health behaviours of friends (all relationships are statistically significant [ $p < 0.001$ ]). Having friends who do not smoke, drink, or use drugs is highly protective against smoking. Nearly all (98.1%) youth who reported that none of their friends smoke are non-smokers themselves. Three in five (60.1%) youth who report that at least some of their friends smoke are non-smokers themselves.

Nine out of ten youth (89.6%) who have no friends who drink alcohol are non-smokers, compared to 61.4% of those with at least some friends who drink.



**Table 5. First Nations youth smoking by peer factors**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Friends Smoke	No friends smoke	1.9 <sup>E</sup> [1.0, 3.3]	98.1 [96.7, 99.0]	***
	Some/most/all friends smoke	39.9 [35.6, 44.3]	60.1 [55.7, 64.4]	
Friends Drink Alcohol	No friends drink	10.4 <sup>E</sup> [6.4, 16.5]	89.6 [83.5, 93.6]	***
	Some/most/all friends drink	38.6 [34.1, 43.3]	61.4 [56.7, 65.9]	
Friends Use Drugs	No friends use drugs	8.7 <sup>E</sup> [5.3, 13.8]	91.3 [86.2, 94.7]	***
	Some/most/all friends use drugs	41.1 [36.7, 45.7]	58.9 [54.3, 63.3]	

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$

<sup>E</sup> indicates high sampling variability, interpret with caution

A similar pattern is evident for friends' drug use which includes marijuana, prescription misuse, and illicit drugs. Of youth who have no drug-using friends, 91.3% do not smoke. Among youth who report some or more of their friends use drugs, 58.9% report not smoking.

### School Factors

Table 6 and 7 display bivariate relationships between smoking behaviour and school-related factors for First Nations youth who are currently attending school.

Youth who have changed schools four or more times due to reasons other than normal progression are less likely to be non-smokers compared to those who have changed schools between one and three times and those who have never changed schools ( $p < 0.05$ ). Four in five youth (83.0%) who have never changed schools are non-smokers compared to 77.5% of youth who have changed schools one to three times, and 68.6% of youth who have changed school four or more times.

Being taught a First Nations language at school and having a First Nations teacher are not significantly associated with youth smoking behaviour.

Academic grades and youth smoking behaviours are significantly related ( $p < 0.001$ ) to youth smoking: 84.7% of high achieving youth who earn As and Bs in school are non-smokers compared to 68.6% of youth who earn lower grades.

The extent to which youth perceive that the presence of alcohol is a problem at school is related to youth smoking behaviour ( $p < 0.05$ ). Youth who disagree that alcohol is a problem at school are more likely to not smoke (80.1% are non-smokers) compared to those who agree that alcohol is a problem at school (71.8% are non-smokers). A similar pattern exists for the perception that the presence of drugs is a problem at school and youth smoking behaviours ( $p < 0.05$ ): 82.6% of youth who think there is not a problem with drugs being present at school are non-smokers compared to 73.8% of those who think there is a problem with drugs at their school.

Parental involvement in school is strongly associated with youth smoking behaviours. Among youth whose parents attend school events, 84.2% do not smoke, compared to 63.5% of those whose parents do not attend school events. This difference is statistically significant ( $p < 0.001$ ).



**Table 6. First Nations youth smoking by school factors**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Changed Schools	Never changed schools	17.0 [12.6, 22.5]	83.0 [77.5, 87.4]	*
	1–3 school changes	22.5 [17.4, 28.7]	77.5 [71.3, 82.6]	
	4 or more school changes	31.4 [23.1, 41.1]	68.6 [58.9, 76.9]	
FN Language at School	Ever taught a FN language at school	21.2 [17.7, 25.2]	78.8 [74.8, 82.3]	n.s.
	Never taught a FN language at school	21.0 [15.7, 27.5]	79.0 [72.5, 84.3]	
FN Teacher	Ever had FN teacher	21.3 [17.2, 26.0]	78.7 [74.0, 82.8]	n.s.
	Never had FN teacher	20.5 [15.0, 27.3]	79.5 [72.7, 85.0]	
Letter Grade	Earn A or B grades	15.3 [12.2, 18.9]	84.7 [81.1, 87.8]	***
	Earn C, D, or F grades	31.4 [24.8, 38.8]	68.6 [61.2, 75.2]	
Alcohol Problem at School	No perceived alcohol problem at school	19.9 [16.0, 24.5]	80.1 [75.5, 84.0]	*
	Perceived alcohol problem at school	28.2 [21.0, 36.7]	71.8 [63.3, 79.0]	
Drug Problem at School	No perceived drug problem at school	17.4 [13.8, 21.8]	82.6 [78.2, 86.2]	*
	Perceived drug problem at school	26.2 [20.9, 32.2]	73.8 [67.8, 79.1]	
Parents Attend School Events	Parents attend school events	15.8 [12.5, 19.7]	84.2 [80.3, 87.5]	***
	Parents do not attend school events	36.5 [27.6, 46.3]	63.5 [53.7, 72.4]	

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$ .  
Non-significant differences indicated by n.s.



**Table 7. First Nations youth smoking by school climate and experience**

Variable	Smoking Ave. [95% CI]	Non-Smoking Ave. [95% CI]	Sig.
Positive school climate	2.96 [2.89, 3.02]	3.04 [3.00, 3.08]	*
Negative school climate	2.51 [2.40, 2.63]	2.35 [2.29, 2.41]	**
Positive school experience	2.85 [2.77, 2.92]	2.96 [2.92, 3.00]	**

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$

For each composite measure, the range is 1–4

Youth who do not smoke report significantly higher values on the positive school climate measure ( $p < 0.05$ ) and significantly lower values on the negative school climate measure

( $p < 0.01$ ). Youth who do not smoke report a significantly more positive school experience than youth who smoke ( $p < 0.01$ ).

### ***First Nations Traditional Culture***

**Table 8. First Nations youth smoking by cultural factors**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Knowledge of FN Language	Any knowledge of a FN language	30.3 [26.1, 34.9]	69.7 [65.1, 73.9]	n.s.
	No knowledge of a FN language	25.9 [20.0, 32.8]	74.1 [67.2, 80.0]	
Perceived Importance of Learning a FN Language	Somewhat important/ Very important	28.9 [24.6, 33.5]	71.1 [66.5, 75.4]	n.s.
	Not important/ A little important	31.1 [25.3, 37.7]	68.9 [62.3, 74.7]	
Satisfaction with Knowledge of Traditional Teachings	Somewhat satisfied/ Very satisfied	25.7 [21.5, 30.5]	74.3 [69.5, 78.5]	n.s.
	Not satisfied/ A little satisfied	31.7 [26.3, 37.6]	68.3 [62.4, 73.7]	
Perceived Importance of Learning About Traditional Teachings	Somewhat important/ Very important	31.4 [26.8, 36.4]	68.6 [63.6, 73.2]	*
	Not important/ A little important	22.5 [17.8, 28.0]	77.5 [72.0, 82.2]	



Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Knowledge of History of One's People	Know a lot/ Know some	28.4 [24.1, 33.2]	71.6 [66.8, 75.9]	n.s.
	Know a little/ Know nothing	30.4 [24.7, 36.8]	69.6 [63.2, 75.3]	
Knowledge of Inherent Rights of One's People	Know a lot/ Know some	27.4 [23.4, 31.8]	72.6 [68.2, 76.6]	n.s.
	Know a little/ Know nothing	29.4 [24.3, 34.9]	70.6 [65.1, 75.7]	
Knowledge of Residential Schools History	Know a lot/ Know some	28.0 [24.0, 32.4]	72.0 [67.7, 76.0]	n.s.
	Know a little/ Know nothing	29.6 [25.2, 34.4]	70.4 [65.6, 74.8]	
Participation in FN Cultural Activities	Participation in the past year	24.6 [20.6, 29.0]	75.4 [71.0, 79.4]	n.s.
	No Participation in the past year	30.5 [26.2, 35.2]	69.5 [64.8, 73.8]	

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
Non-significant differences indicated by n.s.

Knowledge of a First Nations language and perceived importance of learning a First Nations language are not significantly related to youth smoking behaviour. Neither are the relationships between youth smoking and satisfaction with one's knowledge of traditional teachings; knowledge of the history of one's people, the inherent rights of one's people or the history of Residential Schools; or participation in First Nations cultural activities in the past year (see Table 8).

Youth who reported that it is somewhat or very important to learn about traditional teachings are less likely to be non-smokers (68.6%) than those who perceive that it is only a little or not at all important to learn about traditional teachings, of whom 77.5% do not smoke ( $p < 0.05$ ).

## Well-being Factors

Tables 9 and 10 display bivariate relationships between First Nations youth smoking and several measures of well-being.

Smoking behaviours and self-reported physical health are strongly associated in the First Nations youth population

( $p < 0.001$ ). Among youth who report being in excellent, very good, or good physical health, 71.4% do not smoke, while 57.1% of youth who report being in fair or poor physical health are non-smokers.

There is a strong association between self-reported mental health and youth smoking behaviours ( $p < 0.001$ ). Youth who report excellent, very good, or good mental health are more likely to be non-smokers (72.6%) than those who report fair or poor mental health (52.8%).

There is a significant association ( $p < 0.001$ ) between youth smoking behaviour and self-reported experiences of feeling sad, blue, or depressed. Among youth who report not feeling sad, blue, or depressed for two or more weeks in the past year, 79.0% are non-smokers compared to 53.4% of those who did feel sad, blue, or depressed in the past year.

Youth who reported feeling at least moderately lonely are less likely to be non-smokers (59.6%) than those who report feeling not at all or only a little lonely (73.2%). This difference is statistically significant ( $p < 0.01$ ).



**Table 9. First Nations youth smoking and well-being factors**

Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Self-Rated Physical Health	Excellent/Very good/ Good	28.6 [24.6, 32.8]	71.4 [67.2, 75.4]	***
	Fair/Poor	42.9 [36.2, 49.9]	57.1 [50.1, 63.8]	
Self-Rated Mental Health	Excellent/Very good/ Good	27.4 [23.5, 31.6]	72.6 [68.4, 76.5]	***
	Fair/Poor	47.2 [38.4, 56.3]	52.8 [43.7, 61.6]	
Felt Sad/Blue/ Depressed for 2 or more weeks in past year	No	21.0 [18.1, 24.1]	79.0 [75.9, 81.9]	***
	Yes	46.6 [38.9, 54.5]	53.4 [45.5, 61.1]	
Feels Lonely	Not at all/A little	26.8 [22.5, 31.5]	73.2 [68.5, 77.5]	**
	Moderately or more	40.4 [33.1, 48.2]	59.6 [51.8, 66.9]	
Feels Loved	A lot/Quite a bit	24.4 [20.6, 28.6]	75.6 [71.4, 79.4]	***
	Moderately or less	45.3 [36.8, 54.2]	54.7 [45.8, 63.2]	
Feels Stressed	Not at all/A little	24.8 [20.3, 30.0]	75.2 [70.0, 79.7]	***
	Moderately or more	41.4 [35.7, 47.2]	58.6 [52.8, 64.3]	
Consistent Sleep Schedule	All/Most of the time	23.3 [19.3, 27.9]	76.7 [72.1, 80.7]	***
	Some/None of the time	38.7 [33.2, 44.4]	61.3 [55.6, 66.8]	



Variable	Categories	Smoking % [95% CI]	Non-Smoking % [95% CI]	Sig.
Nutritious Balanced Diet	All/Most of the time	23.5 [20.0, 27.5]	76.5 [72.5, 80.0]	***
	Some/None of the time	35.2 [28.8, 42.2]	64.8 [57.8, 71.2]	
Physically Active – How Often	Once a week or more	22.9 [19.3, 27.0]	77.1 [73.0, 80.7]	**
	Less than once a week	31.2 [27.0, 35.8]	68.8 [64.2, 73.0]	

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$

Smoking behaviours and feeling loved are significantly related ( $p < 0.001$ ). Among youth who report feeling loved a lot or quite a bit, 75.6% do not smoke, compared to 54.7% of youth who report feeling moderately, a little, or not at all loved.

Youth who report feeling not at all or only a little stressed are more likely to be non-smokers (75.2%) than those who report feeling moderately stressed or more (58.6%). The relationship between stress and smoking behaviour is statistically significant ( $p < 0.001$ ).

Youth who have a consistent sleep schedule all or most of the time are more likely to not smoke (76.7%) than those who have a regular sleep schedule less often (61.3%). This difference is statistically significant ( $p < 0.001$ ).

Youth who eat a nutritious balanced diet all or most of

the time are significantly ( $p < 0.001$ ) more likely to be non-smokers (76.5%) than those who eat a balanced diet some or none of the time (64.8%).

Youth who participate in physical activity once per week or more are significantly ( $p < 0.01$ ) more likely to be non-smokers than youth who are active less than once per week (77.1% vs. 68.8% are non-smokers respectively).

Youth who do not smoke report significantly higher levels of feeling physically, mentally, emotionally, and spiritually balanced than those who smoke (see Table 10). The difference in reported feelings of balance between smokers and non-smokers is statistically significant ( $p < 0.001$ ). Youth who report being non-smokers also report higher levels of perceived social support than youth who smoke and this difference is statistically significant ( $p < 0.01$ ).

**Table 10. First Nations youth smoking and perceived feelings of balance and social support**

Variable	Smoking Ave. [95% CI]	Non-Smoking Ave. [95% CI]	Sig.
Feeling of balance	3.57 [3.47, 3.68]	3.81 [3.75, 3.87]	***
Social support	3.01 [2.95, 3.07]	3.11 [3.08, 3.14]	**

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$

The *feeling of balance* composite measure range is 1–5, and the *social support* composite measure range is 1–4



## Multivariate Logistic Regression Models by Domain

The following tables display the results of logistic regression models predicting non-smoking among First Nations youth for each of the seven factor domains: individual, other health behaviours, family, peer related, school related, traditional culture, and sense of well-being. Only those factors that were found to be statistically significantly related to smoking behaviours in the bivariate analyses in the previous section are included in these models.

The tables display odds ratios, which show the odds of an individual not smoking as compared to the odds of not smoking for an individual with different characteristics.

For categorical variables like sex, the odds ratios show how much more or less the odds for a male youth are to not smoke compared to a female. For continuous variables, like level of mastery or other composite measures, the odds ratios show the increase or decrease in odds for someone to not smoke when that measure increases by one unit. These are multivariate models, which have the advantage of showing the relationship between youth smoking and protective factors, while controlling for other factors in each model. This allows for an analysis of the unique independent association between each factor and smoking, while keeping the effects of other factors in the model constant.

**Table 11. Logistic regression predicting non-smoking among First Nations youth, individual factors**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Sex	Male	1.15	0.24	n.s.
	Female	-		
Age	12–14 years old	7.28	0.31	***
	15–17 years old	-		
School Status	Completed School	1.78	0.39	n.s.
	Left School	0.86	0.33	n.s.
	In School	-		
Volunteering in Community	Don't Volunteer	1.95	0.24	**
	Volunteer	-		
Positive attitude toward postsecondary education		1.38	0.25	n.s.
Level of Mastery		3.72	0.39	***

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -

### Individual Factors

Table 11 includes all the individual factors that were found to be significantly associated with First Nations youth smoking from Table 1. Table 11 shows that males have equal odds of being non-smokers compared to females, controlling for the other variables in the model. Younger youth aged 12 to 14 have odds of not smoking 7.28 times as high as those of youth aged 15 to 17, all else equal ( $p < 0.001$ ). There is no significant difference in the odds of not smoking between youth who have finished school, who are still in school, or who left school before graduation, controlling for other included covariates. Youth who do not volunteer without pay in the community have 1.95 times the odds of

being non-smokers compared to those who do volunteer ( $p < 0.01$ ). For every unit increase in the mastery scale, the odds of not smoking increase by 3.72 times ( $p < 0.001$ ), but there is no significant relationship between attitudes towards postsecondary education and youth smoking, controlling for other factors.

### Other Health Behaviours

Table 12 displays the results of a multivariate logistic regression model predicting not smoking by other substance-related behaviours of First Nations youth.



**Table 12. Logistic regression predicting non-smoking among First Nations youth, other health behaviours**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Alcohol Consumption	No drinking in past year	1.26	0.54	n.s.
	Drank alcohol in past year	-		
Binge Drinking	No binge drinking in past year	3.54	0.51	*
	Binge drank in past year	-		
Used marijuana or illicit drugs or misused prescription drugs	No drug use in past year	18.29	0.36	***
	Used drugs in past year	-		

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -

Table 12 shows that youth who did not drink any alcohol in the past year are no more likely to be non-smokers than those who drank alcohol, controlling for binge drinking and other drug use. However, youth drinkers who did not binge drink last year have odds of being non-smokers 3.54 times

as high as those who consumed five or more drinks in one sitting in the past year ( $p < 0.05$ ). Youth who did not use any other drugs in the past year have 18.29 times the odds of being non-smokers compared to those who did use drugs, controlling for the other factors ( $p < 0.001$ ).

### Family Factors

**Table 13. Logistic regression predicting non-smoking among First Nations youth, family factors**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Smoking in Home	Smoking in home	0.76	0.23	n.s.
	Live in a smoke-free home	-		
Foster Care	Never been in foster care	1.41	0.34	n.s.
	Ever been in foster care	-		
Family Residential School Attendance	No family attended Residential School	2.03	0.23	**
	At least one family member attended	-		
Household Crowding	Home is not crowded	1.48	0.20	*
	Live in a crowded home	-		
Father's Employment Status	Father doesn't work for pay	0.29	0.24	***
	Father works part time	0.52	0.32	*
	Don't know/Not applicable/Refused	0.28	0.32	***
	Father works full time	-		
Parental Education	Both parents less than high school	0.65	0.31	n.s.
	At least one parent high school graduate	1.61	0.26	n.s.
	Don't know/Not applicable/Refused	0.73	0.50	n.s.
	At least one parent more than high school	-		

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -



Table 13 displays a multivariate logistic regression model predicting not smoking using family-related factors. Youth who live in a home in which someone smokes have similar odds of being non-smokers compared to youth living in smoke-free homes, all else equal. There is also no significant relationship between experience in foster care and youth smoking once the other variables in the model are included. Youth whose family members did not attend Residential Schools have 2.03 times the odds of being non-smokers compared to those who have at least one family member who attended Residential Schools, controlling for other factors ( $p < 0.01$ ).

Youth who live in non-crowded homes have odds of being non-smokers 1.48 times as high as those in crowded homes, considering the other variables in the model. All else equal, youth whose fathers do not work for pay are less likely to be non-smokers than youth whose fathers work full time (0.29 times the odds,  $p < 0.001$ ). Youth with fathers who work part time are also less likely to be non-smokers than those with fathers who work full time (0.52 times the odds,  $p < 0.05$ ), and those who do not know, or did not answer the question, about their father's work status have 0.28 times

the odds of being non-smokers compared to youth with full-time working fathers ( $p < 0.001$ ). There is no statistically significant relationship between parental education and youth smoking when controlling for the other factors.

### Peer Factors

Table 14 shows the relationship between First Nations youth smoking behaviours and their friends' smoking, drinking, and drug use.

Youth whose friends do not smoke have much higher odds of being non-smokers: they have odds 40.16 times as high as youth who have friends who smoke, controlling for peer drinking and drug use ( $p < 0.001$ ). Youth who have no friends who use any type of drugs, including marijuana, illicit drugs, or prescription misuse, have 2.61 times the odds of not smoking, compared to those whose friends use drugs, all else equal ( $p < 0.05$ ). Peer drinking behaviour is not significantly related to First Nations youth smoking behaviour, once peer smoking and peer drug use are considered.

**Table 14. Logistic regression predicting non-smoking among First Nations youth, peer factors**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Friends Smoke	No friends smoke	40.16	0.58	***
	Some/most/all friends smoke	-		
Friends Drink Alcohol	No friends drink	0.71	0.41	n.s.
	Some/most/all friends drink	-		
Friends Use Drugs	No friends use drugs	2.61	0.45	*
	Some/most/all friends use drugs	-		

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -

### School Factors

Table 15 displays the results of a multivariate logistic regression predicting not smoking using school related factors for only those youth who are currently enrolled in school.

First Nations youth who changed schools one to three times have 2.23 times the odds of being non-smokers compared to those who changed schools four or more times ( $p < 0.05$ ). However, there was no significant relationship between never having changed schools and smoking behaviour, as compared to having changed schools four or more times, once other school-related variables are controlled.

First Nations youth who earn A and B grades have odds

of not smoking 2.0 times as high as those youth who earn Cs or lower, holding other variables constant ( $p < 0.05$ ). Whether or not youth perceive alcohol or drugs as a problem at their school is not significantly associated with smoking, controlling for the other variables.

Youth whose parents do not attend school events are also less likely to be non-smokers compared to youth whose parents attend school activities, all else equal (0.42 times the odds,  $p < 0.01$ ). Youth who report having a more positive school experience have 1.59 times the odds of not smoking with every unit increase ( $p < 0.01$ ). None of the other school-related variables are significantly related to smoking in this multivariate model.



**Table 15. Logistic regression predicting non-smoking among First Nations youth currently in school, school factors**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Changed Schools	Never changed school	1.72	0.43	n.s.
	1–3 school changes	2.23	0.34	*
	4 or more school changes	-		
Letter Grade	Earn A or B grades	2.00	0.27	*
	Earn C, D, or F grades	-		
Alcohol Problem at School	No perceived alcohol problem at school	1.85	0.49	n.s.
	Perceived alcohol problem at school	-		
Drug Problem at School	No perceived drug problem at school	1.37	0.34	n.s.
	Perceived drug problem at school	-		
Parents Attend School Events	Parents do not attend school events	0.42	0.30	**
	Parents attend school events	-		
Positive school climate		0.83	0.41	n.s.
Negative school climate		1.18	0.23	n.s.
Positive school experience		1.59	0.17	**

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -

### ***First Nations Traditional Culture***

Table 16 presents the odds ratio for the one culture-related variable that was found to be statistically significantly related to First Nations youth smoking in the bivariate anal-

ysis. Youth who said it is not important or a little important to learn about traditional teachings have odds of being non-smokers 2.05 times as high as those of youth who think that learning about traditional teachings is very or somewhat important ( $p < 0.01$ ).

**Table 16. Logistic regression predicting non-smoking among First Nations youth, cultural factors**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Perceived Importance of Learning About Traditional Teachings	Not important/ A little important	2.05	0.25	**
	Somewhat important/ Very important	-		

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Reference categories indicated by -

### ***Well-being Factors***

Table 17 presents the results of a multivariate logistic regression that includes the well-being factors that were found to be significantly associated with First Nations youth smoking in the bivariate analyses.

First Nations youth who reported being in excellent, very good, or good mental health have 3.77 times the odds of be-

ing non-smokers compared to those who are in poor or fair mental health, controlling for the other factors ( $p < 0.001$ ). Youth who report not feeling depressed in the past year have odds of not smoking that are 1.71 times those of youth who reported feeling depressed, all else equal ( $p < 0.05$ ). The other variables, including self-rated physical health; feeling lonely, loved, or stressed; regular sleep; balanced diet; feeling in balance; and amount of social support, are not significantly related to smoking behaviour in the multivariate model.



**Table 17. Logistic regression predicting non-smoking among First Nations youth, well-being factors**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Self-Rated Physical Health	Excellent/Very good/Good	1.21	0.37	n.s.
	Fair/Poor	-		
Self-Rated Mental Health	Excellent/Very good/Good	3.77	0.33	***
	Fair/Poor	-		
Felt Sad/Blue/ Depressed for 2 or more weeks in past year	No	1.71	0.24	*
	Yes	-		
Feels Lonely	Not at all/A little	0.68	0.32	n.s.
	Moderately or more	-		
Feels Loved	A lot/Quite a bit	1.70	0.29	n.s.
	Moderately or less	-		
Feels Stressed	Not at all/A little	1.53	0.29	n.s.
	Moderately or more	-		
Consistent Sleep Schedule	All/Most of the time	1.49	0.23	n.s.
	Some/None of the time	-		
Nutritious Balanced Diet	All/Most of the time	0.98	-0.24	n.s.
	Some/None of the time	-		
Physically Active – How Often	Once a week or more	1.25	0.21	n.s.
	Less than once a week	-		
Feeling of balance		0.82	0.17	n.s.
Social support		1.49	0.24	n.s.

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -

## Full Logistic Regression Models

The following tables display the results of multivariate logistic regression models predicting not smoking. These models include all those variables that were found to be significantly related to smoking in the domain-specific multivariate models in the previous section. Table 18 includes covariates that apply to all First Nations youth and Table 19 adds significant school-related variables that only apply to youth who are currently in school.

There are six factors significantly related to First Nations youth smoking behaviours in the model shown in Table 18. First Nations youth whose fathers do not work for pay (0.30 times the odds,  $p < 0.001$ ), and youth who did not provide a response for their father's employment status (0.41 times the odds,  $p < 0.01$ ), are significantly less likely to be non-smokers compared to youth whose fathers work full time, controlling for the other covariates in the model. Youth who do not vol-

unteer in the community have 2.33 times the odds of not smoking ( $p < 0.001$ ) compared to youth who do volunteer, all else equal.

The youth's own health behaviours, and the health behaviours of their peers, are very strongly associated with smoking. Youth who did not binge drink alcohol in the past year have 4.57 times the odds of being a non-smoker, those who did not use drugs last year have 8.01 times the odds of being a non-smoker, and those whose friends do not smoke have 18.05 times the odds of not smoking themselves, controlling for other factors ( $p < 0.001$ ). Finally, youth who report having excellent, very good, or good mental health have odds of being non-smokers that are 5.56 times as high as those with poor or fair mental health, after controlling for other factors ( $p < 0.001$ ).



**Table 18. Logistic regression predicting non-smoking among First Nations youth**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Age	12–14 years old	1.80	0.30	n.s.
	15–17 years old	-		
Family Residential School Attendance	No family attended Residential School	0.84	0.25	n.s.
	At least one family member attended	-		
Household Crowding	Home is not crowded	1.05	0.26	n.s.
	Live in a crowded home	-		
Father's Employment Status	Father doesn't work for pay	0.30	0.31	***
	Father works part time	0.53	0.36	n.s.
	Don't know/Not applicable/Refused	0.41	0.33	**
	Father works full time	-		
Volunteering in Community	Don't Volunteer	2.33	0.25	***
	Volunteer	-		
Level of Mastery		2.08	0.39	n.s.
Binge Drinking	No binge drinking in past year	4.57	0.31	***
	Binge drank in past year	-		
Used marijuana or illicit drugs or misused prescription drugs	No drug use in past year	8.01	0.33	***
	Used drugs in past year	-		
Friends Smoke	No friends smoke	18.05	0.55	***
	Some/most/all friends smoke	-		
Friends Use Drugs	No friends use drugs	0.93	0.45	n.s.
	Some/most/all friends use drugs	-		
Perceived Importance of Learning About Traditional Teachings	Not important/ A little important	1.67	0.27	n.s.
	Somewhat important/ Very important	-		
Felt Sad/Blue/ Depressed for 2 or more weeks in past year	No	1.12	0.26	n.s.
	Yes	-		
Self-Rated Mental Health	Excellent/Very good/Good	5.56	0.48	***
	Fair/Poor	-		

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -



**Table 19. Logistic regression predicting non-smoking among First Nations youth currently in school**

Variable	Categories	Odds Ratio	Std. Error	Sig.
Age	12–14 years old	1.11	0.39	n.s.
	15–17 years old	-		
Family Residential School Attendance	No family attended Residential School	0.46	0.36	*
	At least one family member attended	-		
Household Crowding	Home is not crowded	1.51	0.40	n.s.
	Live in a crowded home	-		
Father's Employment Status	Father doesn't work for pay	0.34	0.41	**
	Father works part time	0.43	0.38	*
	Don't know/Not applicable/Refused	0.86	0.47	n.s.
	Father works full time	-		
Volunteering in Community	Don't Volunteer	2.72	0.39	*
	Volunteer	-		
Level of Mastery		5.55	0.53	**
Binge Drinking	No binge drinking in past year	11.04	0.45	***
	Binge drank in past year	-		
Used marijuana or illicit drugs or misused prescription drugs	No drug use in past year	6.04	0.39	***
	Used drugs in past year	-		
Friends Smoke	No friends smoke	16.24	0.66	***
	Some/most/all friends smoke	-		
Friends Use Drugs	No friends use drugs	0.92	0.46	n.s.
	Some/most/all friends use drugs	-		
Perceived Importance of Learning About Traditional Teachings	Not important/ A little important	2.99	0.37	**
	Somewhat important/ Very important	-		
Felt Sad/Blue/ Depressed for 2 or more weeks in past year	No	0.70	0.41	n.s.
	Yes	-		
Self-Rated Mental Health	Excellent/Very good/Good	6.02	0.58	**
	Fair/Poor	-		
Changed Schools	Never changed school	0.52	0.60	n.s.
	1–3 school changes	0.84	0.46	n.s.
	4 or more school changes	-		
Letter Grade	Earn A or B grades	1.12	0.39	n.s.
	Earn C, D, or F grades	-		
Parents Attend School Events	Parents do not attend school events	0.45	0.43	n.s.
	Parents attend school events	-		
Positive school experience		1.28	0.31	n.s.

Notes: \*\*\*  $p < 0.001$  \*\*  $p < 0.01$  \*  $p < 0.05$   
 Non-significant differences indicated by n.s.  
 Reference categories indicated by -



Table 19 displays the same full logistic regression model as Table 18, but includes only those youth currently enrolled in school and adds school-related factors. All the factors that are significantly associated with not smoking for all youth are also significant in this student-only model, including father's work status, volunteering, binge drinking, drug use, peer smoking, and self-reported mental health. Binge drinking is more strongly related to smoking among students: Students who did not binge drink have 11.04 times the odds of not smoking compared to students who did binge drink.

There are also three factors that are significantly associated with smoking behaviour among students that were not significant for all First Nations youth. Youth whose family members did not attend Residential School are less likely to be non-smokers than youth who have a family member who attended a Residential School (0.46 times the odds,  $p < 0.05$ ). Youth with higher levels of mastery are more likely to be a non-smoker, all else equal ( $p < 0.01$ ); every unit increase in mastery level increases the odds of not smoking by 5.55 times. Students who think it is not important to learn about traditional teachings have 2.99 times the odds of not smoking, all else equal ( $p < 0.01$ ).

## Predicted Probability of Not Smoking for Hypothetical Youth

**Figure 4. Predicted probabilities of not smoking for five hypothetical First Nations youth with varying protective factors**

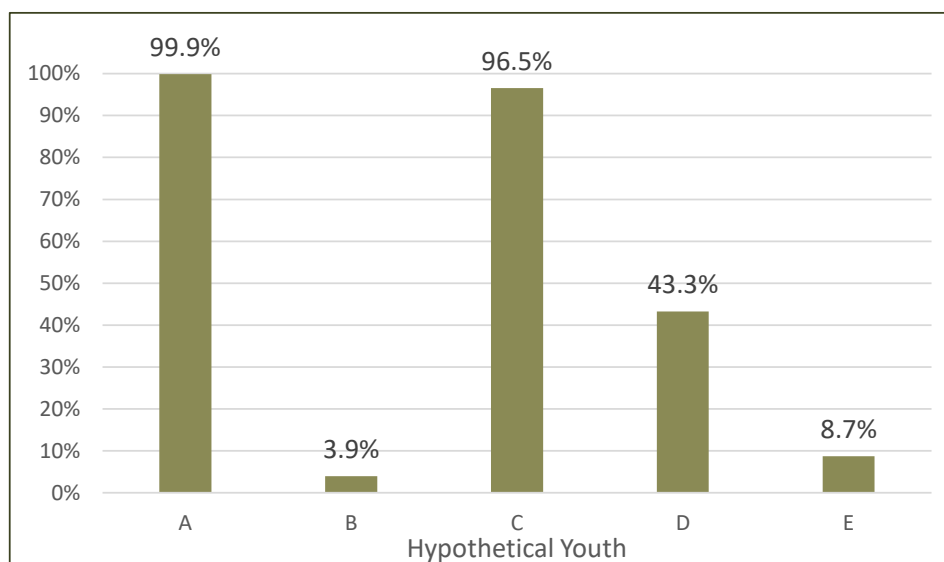


Figure 4 displays the predicted probability of not smoking for each of five hypothetical youth with various protective and risk factors. These estimates are derived from the full regression model presented in Table 18; they hold all the non-significant factors at typical values and vary across the six significant factors.

**Hypothetical youth A (all protective factors)** – The bar labelled A represents a First Nations youth who does not volunteer and does not binge drink or use drugs. Their friends do not smoke, they have good mental health, and their father works full time. Hypothetical youth A has a 99.9% chance of being a non-smoker.

**Hypothetical youth B (no protective factors)** – The bar labelled B represents a First Nations youth who volunteers in the community, binge drinks, and uses drugs. Their friends smoke, they have fair or poor mental health, and their father does not work for pay. Hypothetical youth B has a 3.9% chance of being a non-smoker.

**Hypothetical youth C** – The bar labelled C represents a First Nations youth who volunteers in the community and does not binge drink or use drugs. They have friends who smoke, report good mental health, and their father works full time. They have a 96.5% chance of not smoking.

**Hypothetical youth D** – The bar labelled D represents a First Nations youth who volunteers in the community, binge drinks, and uses drugs. They have friends who smoke, report good mental health, and their father works full time. They have a 43.3% chance of not smoking.

**Hypothetical youth E** – The bar labelled E represents a First Nations youth who does not volunteer in the community and does not binge drink or use drugs. Their friends smoke, they report fair or poor mental health and have a father who does not work for pay. They have an 8.7% chance of not smoking.



## Qualitative Results: Community Tobacco Reduction Initiatives

There were four overarching themes across the interviews regarding tobacco reduction initiatives for First Nations youth living on reserves: absence of a sex and gender lens, importance of community-specific programming, recognition of Indigenous social determinants of health, and cigarette smoking as normalized.

First, the interviews relayed that a sex and/or gender lens is rarely placed on youth tobacco reduction initiatives, including their own. As one interviewee said, “None of what we do is gender specific, we are age specific only.” If gender is recognized, it is most often specific to adult females and pregnancy. An interviewee shared, “We take it [referring to gender specific programming] outside of youth programming, and into pregnancy.” Another interviewee commented, “Do we need a gender lens? Yes we do, but the emphasis is usually on pregnancy. That is where [we] see prevention messages.” Female-specific messaging is generally that women should not smoke during pregnancy, and tobacco-use messaging is not typically expanded to child-rearing years. There is some attention to partners and the community supporting women to not smoke while pregnant, but overwhelmingly it is focused on the mother-to-be. One interview emphasized that “a gender-based approach is not just about women.”

This does not mean that gender informed programming does not exist in Canada for First Nations youth on reserves, but it was generally absent in the interviews for this report. One example of such programming is the work of the Canada Prenatal Nutrition Programs<sup>8</sup> on reserves, which have the opportunity to discuss tobacco with women and use resources such as the *Sacred Tobacco, Sacred Children* materials about smoke-free homes, produced by Best Start in Ontario.<sup>9</sup> Some interviews recognized that females are more likely to smoke in comparison to males, and for specific and potentially different reasons, such as to address negative emotions, including daily stressors as well as ongoing personal challenges such as anxiety. Some interviewees also commented that they felt females smoked in response to what was described by one interviewee as “emotional work” taken on at a young age that is tied to their gender roles (e.g., care for siblings) and non-gender specific roles as well (e.g., planning required to keep family problems from being “found out”). Some interviewees noted that a gender lens needs also to be placed at a First

Nations cultural level (for example, recognizing the traditional role of females and tobacco in ceremonial teachings in some communities): “Culture is important, including to Indian women, and more now than ever.”

Second, programs were identified as needing to be community specific and focused, because each First Nations community is unique. For example, one contact said that youth smoking in one community was influenced by its perceived “coolness,” while in another youth were not smoking for this same reason. Initiatives need also to be youth specific and focused. One example shared is a smoking prevention campaign created by First Nations youth in British Columbia.<sup>10</sup> It was also noted that there is limited empirical-based youth-focused tobacco programming available, and even less specific to First Nations youth. At the same time, it was suggested that there is a need for approaches to youth cigarette smoking that are “...more organic: Bring youth together and have opportunities for them to check in with one another and spontaneously share about progress they have made, like with trying to quit smoking.”

Central to all initiatives reviewed was their cultural specificity and focus. Distinction was made in initiatives between sacred tobacco use and its linkage to cultural knowledge and commercial cigarette smoking. One interviewee stated,

*Culture is incorporated into everything we do. Start with a circle and smudging—[sharing] uses of tobacco, offering tobacco as prayers when dancing, after with the sacred fire. Start with [it in] ceremony, in everything we do. We respect the tobacco in this way.*

Third, the influential role of the social determinants of Indigenous health were recognized as underlying reasons for smoking. As one interviewee communicated, “We need to think about gender and culture together. And other determinants of health too. So much going on that we need to embrace.” According to the work of Loppie Reading and Wien (2009), “[t]he social determinants of health can be categorized as distal (e.g., historic, political, social and economic contexts), intermediate (e.g., community infrastructure, resources, systems and capacities), and proximal (e.g., health behaviours, physical and social environment)” (p. 1). The same interviewee further shared,

*We need to be ready with Indigenous-specific ways of ap-*

<sup>8</sup> <https://www.canada.ca/en/public-health/services/health-promotion/childhood-adolescence/programs-initiatives/canada-prenatal-nutrition-program-cpn.html>

<sup>9</sup> <https://www.beststart.org/cgi-bin/commerce.cgi?preadd=action&key=N02-A>

<sup>10</sup> See <http://www.fnha.ca/about/news-and-events/news/first-nations-teens-create-innovative-smoking-prevention-campaign-for-youth-in-bc>



*proaching—culturally safe ways of addressing tobacco that take into account all the determinants of health (gender, violence, remoteness, education). My biggest critique with the tobacco field in the past and today is still its narrow focus.*

For example, the interviews identified the relationship between youth smoking and coping (e.g., depression, anxiety), and the need to address this in a larger context. According to one interviewee, “[We] need to do larger mental health initiatives (prevention) where it is clear to the youth that if you have mental health problems, and no alternative coping skills, then you may end up smoking.”

Interviewees also identified the link between smoking for First Nations youth on reserves and inter-generational colonial processes resulting in individual and communal loss, grief, pain, and trauma. An interviewee noted,

*Culture needs to be there. It was taken. Culture in itself is a protective factor, it is identity. Self-worth. Other things that lead to smoking are symptoms of addiction. Trauma, pain. So many other things, [we] need culture to heal. Need better coping mechanisms so youth don’t see the need to smoke. There is a colonization linkage. Respect tobacco so then [youth] won’t use.*

Fourth, the interviews showed that tobacco use in most reserve communities has cultural and spiritual significance, but at the same time the commercial use of tobacco by cigarette smoking is highly normalized, including among traditional community leaders (e.g., Elders, Sweat Lodge Keepers). One interviewee commented,

*No, culture [referring to cultural ceremonies] is not a protective factor for smoking. A lot of the drummers and powwowers and sweat lodge conductors smoke—in fact, [they are] one of the largest smoking groups (may be part generational). It is still socially acceptable in that group.*

Another stated,

*There are cultural programs that speak about the importance of tobacco, offering it to the land, connecting to the Creator—but there is contradiction because the people smoke. We need to have Elders sharing who do not smoke. People smoke at the sweat, they smoke in the lodge. But if the Elder is there that does not smoke, they don’t.*

This was seen as being contradictory for the youth with cessation program messaging: “Traditional Elders always talk about the spiritual use of tobacco. It is more powerful when a non-smoking Elder shares this though. Kids are noting the contradiction; they are even telling Elders that their [the Elders’] use is not traditional use!”

Tobacco was identified by one interviewee as the “lesser of the evils, when compared to suicide or drugs” and “is an accepted means to cope.” Others identified it as having a general place of community acceptance. As shared in one interview, “They do it because it is cool, everyone in their families is doing it (it is normalized), and gangs ask them to.” Unique to some communities is commercial tobacco’s commodity or value-based role and a resistance to looking at it otherwise. Related, commercial cigarettes were also noted as being easy to access for First Nations youth on reserves in part because of the lower cost due to taxation laws.

The interview questions asked generally about protective and risk factors, with responses categorized into the 2016 FNIGC youth smoking report categories. No factors were identified that did not match the pre-existing categories. Responses were to two guiding questions: “Do the protective and risk factor findings from the FNREEES analysis apply to the community programs?” and “Are any additional protective and risk factors identified in the community programs for understanding youth smoking?”

The key themes identified in the interview analysis are as follows:

## **Protective and Risk Factors**

### Individual

- Differences between male and female rates of smoking were generally not recognized.
- Stress was identified as a common risk factor for smoking among First Nations youth.

### Family

- Youth with stable home lives and attentive parents were identified as less likely to smoke. Conversely, youth with unstable home lives, characterized by neglect, parental drug use, grief, and distress were more likely to smoke.
- Parents, siblings, and extended family members were identified as role models for youth and had a substantial influence on their non-smoking and smoking behaviours.
- A stable home life was linked to increased self-esteem in youth, and decreased likelihood to smoke.
- The impacts of colonization, in particular Residential Schooling, were noted for their potential devastating and inter-generational impact on the home life of youth (e.g., addiction among parents).



- Youth from more well-educated families were less likely to smoke because caregivers tend to be more involved in the youths' lives and have open conversations with them.
- Youth who are connected generally—to school, non-using peers, sports teams, for example—were less likely to smoke.

#### Peer

- Peers have substantial, and possibly the greatest, influence on youth smoking behaviors. It was mentioned that peers are the initial influence and then the youth continue to smoke for additional personal reasons (for example, calming effect, lack of other coping mechanisms, etc.).
- Proximity to urban centres influences the likelihood to smoke cigarettes; the closer to an urban centre, the greater the influence, access, and likelihood of smoking.

#### School

- Youth who stay in school are less likely to have early onset depression, anxiety, and other mental health issues and therefore are less likely to take up smoking.

#### First Nations traditional culture

- First Nations traditional culture was identified as a protective factor, and concern was expressed over the inter-generational loss of culture. Recognizing this, tobacco reduction initiatives were identified as one place to share knowledge about culture and provide cultural opportunities. The interviews revealed that teaching about the sacred use of tobacco versus commercial use is a natural entry into traditional teachings.
- Culture, particularly language, was identified as a protective factor because it is linked to identity, self-worth, connection to the land and creation.
- The activities involved in practicing culture were not identified as a protective factor for smoking. In fact, these were identified as a risk factor. Smoking appears to be common among community cultural leaders at cultural events: drummers, pipe carriers, and Sweat Lodge Keepers. It is generally socially acceptable in this group to smoke commercial cigarettes; this may reflect norms of the generation of the cultural leaders.

### ***Individualized Program Approaches***

- Tobacco is generally addressed in isolation from other substances, and sometimes even from larger understandings and approaches to wellness, and this is most often in response to funding requirements (i.e., mandated to address only tobacco). There are some select non-tobacco initiatives, like prenatal nutrition programs, that do address tobacco.
- Tobacco reduction initiatives with a First Nations youth focus, whether prevention (education), reduction, or cessation, are newer for the field. There is almost no reduction programming available for youth because it is illegal for people in this age range to smoke, so the focus is predominantly on smoking cessation for youth who do smoke.
- That said, some tobacco reduction initiatives, and especially the Health Canada community initiatives, take a comprehensive, multi-pronged approach, including education (e.g., awareness campaigns), prevention (for young children), adult cessation (especially for males and pregnant females), research (evaluating initiatives), protection from second-hand smoke (not a lot of attention generally), and supply reduction (reduced access to tobacco products).
- A cultural component, specifically teaching the distinction between traditional, sacred, and commercial tobacco use, is central to initiatives implicated in this report. This includes, for example, learning about (and practicing) the Pipe, drumming, smudge, tobacco ties, medicine pouches, sharing circles, Elders, and the link to Creator and creation.

### ***Tobacco Education/Prevention, Cessation, and Reduction Initiatives***

#### Education/prevention approaches

- Mainly connect with youth in schools (which excludes youth not in school) and at community events, and primarily with a cessation message.
- Have culturally inspired 'no commercialized tobacco use' signs in the community.
- Share how tobacco is used traditionally and is not to be used commercially; it is a sacred medicine.
- Have open dialogue with youth, and increasingly at younger grades and ages.
- Educate on peers supporting peers to not smoke cigarettes.



### Cessation approaches

- ♦ Initiatives focus specifically on cessation.
- ♦ Link to dangers of tobacco use, national non-smoking week, contests, social media, and apply to programs that exist for youth (although there are few such programs, and even fewer evidence-based ones).
- ♦ Cessation initiatives are difficult on reserves where commercial cigarette smoking is normalized.

### Reduction approaches

- ♦ Involve retailers in reduction initiatives: offer them tool kits, education on covering over cigarette displays, asking youth for identification, and following provincial guidelines.
- ♦ Reduction initiatives are difficult on reserves where smoking cigarettes is normalized.
- ♦ Youth generally want to discuss and have conversations about smoking (reasons why they do it, ways they can decrease their use) but not stop smoking immediately.

- ♦ Facts are shared to help inform youth choices (e.g., light cigarettes are not less harmful to one's health, targeted marketing by the tobacco industry).
- ♦ Communities are given little guidance in offering initiatives specific to youth who continue to smoke (underage smoking is illegal).

### Other approaches

- ♦ Several tobacco-related substances were identified as being used by youth, varying across the country and by community. These included vaping and electronic cigarettes ("devices that emit doses of vaporized nicotine that are inhaled"),<sup>11</sup> with little awareness of the harms of either; chewing tobacco, including increased use among sports team players; and misunderstanding, mixed messages, and an absence of information on the harms/non-harms of marijuana use. There is also a general absence of attention to second-hand smoke and to the health effects of the use of pipes and cigars.



<sup>11</sup> <http://www.medicalnewstoday.com/articles/216550.php>



## Discussion



The majority—about 7 in 10—of First Nations youth on reserves do not currently smoke; however, the FNREEES data does not provide information on whether any of these non-smokers are former smokers. Of those youth who do smoke, equal proportions (approximately 15% each) were either occasional or daily smokers. In most of the analyses, these two behaviours were grouped together due to relatively small sample sizes, so a caution in considering these findings is that youth “smokers” may smoke as much as several times a day or as little as a few times a year.

As shown in Appendix A, certain findings from the 2016 FNIGC youth smoking report were not supported in this report; for example, having a smoke-free home, living with biological parent(s), and other factors found to be significantly associated with smoking behaviours in the former report were determined to be insignificant as protective or risk factors in some of the analyses shown here. These differences may be due to a number of reasons: First, attitudes and behaviours, particularly regarding tobacco use, in the population may have changed in the three to seven years in between data collection for the RHS Phase 2 and FNREEES surveys. Second, because most of the RHS analyses separated daily and occasional smokers while most of the FNREEES analyses combined them, the specific behaviours being analyzed for their association with the protective and risk factors are somewhat different in the two studies. Finally, the analyses in this report employed different methods: the bivariate analyses used adjusted chi-square rather than non-overlapping confidence intervals to determine significance, and the multivariate analyses built upon the bivariate findings by adding more sophisticated multiple logistic regression analyses, which allowed for exploration of the associations while controlling for other factors.

### **Individual Factors**

A higher percentage of females than males are likely to report being daily or occasional smokers. This was a similar finding as in the 2016 FNIGC youth smoking report on the RHS data; it also found that females had a lower daily cigarette consumption average. This suggests the need to learn further about protective factors for smoking by sex and gender (Amos et al., 2012; Greaves, 1996; Greaves, 2015; Greaves et al., 2016; Stewart et al., 2011). This was likewise supported in the interviews. In fact, it was mentioned that sex and gender are seldom accounted for

in tobacco interventions, but upon reflection they should be; this did not reflect a deliberate omission as much as an oversight and lack of information.

At the same time, while bivariate analyses of both RHS and FNREEES data showed a higher prevalence of smoking among females than among males, the multivariate analyses in this report did not show significant sex differences once other factors are considered, suggesting that differences between males’ and females’ smoking are explained by the other factors considered here. Again, further research attention to both sex and gender is warranted. It is also important to acknowledge that the health risks of tobacco use for females are higher in comparison to males, and so equal levels of use does not amount to health equity.

Although multivariate analyses showed that sex was no longer a protective factor once other factors were accounted for, with males and females equally likely to be non-smokers, it remains important to consider sex and gender, for numerous reasons identified in past research on tobacco use. For example, “[t]he menstrual cycle influences withdrawal symptoms, [and] ... [w]omen more often smoke to control negative mood and emotions” (Centre of Excellence for Women’s Health, 2018, p. 1).

Smoking is also more common among older youth in comparison to younger youth, with the most common age of onset between 12 and 14 years old. This is supported in the 2016 FNIGC youth smoking report, with the additional finding that more youth who started to smoke at a younger age were daily, as compared to occasional, smokers. Interviews also revealed that there is a need to be aware that education and prevention work needs to be increasingly done at younger ages and school grades. This supports the literature indicating the protective importance of delaying the age of onset of use among youth (Azagba & Asbridge, 2013; Glynn, 1989; Ryan, Leatherdale, & Cooke, 2016).

Drawing on bivariate and multivariate analyses, the following key protective factors from smoking for First Nations youth on reserves were identified:

Key individual factors play an important role in whether youth smoke. These include being in school (more than three-quarters of youth in school do not smoke), valuing postsecondary education, and feeling in control of one’s life. Feeling in control was supported in the 2016 FNIGC youth smoking report, linking it to self-esteem, and the lit-



erature supports all protective factors generally (Doucette, 2007; Ryan et al., 2016). Being in school and feeling in control of one's life were both mentioned in the interviews. Valuing postsecondary education was not specifically addressed in the interviews or literature, but attention to individuals' stress is generally cited as a common risk factor among First Nations youth. Stress as a reason for First Nations youth on reserves smoking was likewise identified in a study of four First Nations communities across Canada (Cote-Meek, Isaac-Mann, Eshkakogan, Selby, Smith, Martin, Karacsonyi, & White, 2014).

An interesting finding is that First Nations youth who volunteer in their community are more likely to smoke; 63% of volunteers are non-smokers versus 75% of non-volunteers. The interviews found that this may in part be related to the type of activities for which youth are volunteering, for example noting that there are high rates of cigarette smoking at traditional First Nations community events. The 2016 FNIGC youth smoking report, however, found that participation in one's local community cultural events was a protective factor. Insight from the literature supports the findings of this report. Ryan, Leatherdale, and Cooke (2016) found that "[t]hose [youth] who had hunted, fished or trapped within the past year were more likely to be current smokers compared to those who had not participated in such traditional activities (23.2% vs. 18.0%)" (p. 110). Using the same dataset (the 2012 Aboriginal Peoples Survey), the authors found that adults who recently attended a Métis cultural event were more likely to smoke (Ryan et al., 2016). And the work of Unger et al. (2006) in the United States found that "tobacco smoking (both homegrown and commercial tobacco) was a common occurrence at Indian ceremonies such as sweat lodges and wakes, and at events such as [a] Pow Wow" (p. 443.e11).

Three individual factors continued to be protective in the multivariate analyses by domain: age (youth age 12 to 14 have 7.28 times the odds of being a non-smoker compared to youth age 15 to 17), not volunteering (youth who do not volunteer without pay in the community have odds of being non-smokers 1.95 times as high as those who do volunteer), and level of mastery (youth with a one unit increase in the mastery measure have 3.72 times the odds of being non-smokers).

### **Other Health Behaviours**

Not using other substances, including marijuana, other illicit drugs, or alcohol, and abstaining from misusing prescription drugs or binge drinking are also protective factors in the bivariate analysis. Out of every 10 youth, nearly 9 that do not use marijuana or do not use alcohol also do not smoke; 8 that do not binge drink also do not smoke;

and 7 that do not use illicit drugs or misuse prescription drugs do not smoke. This too is supported in the 2016 FNIGC youth smoking report and in the literature (Cotton & Laventure, 2013; Elton-Marshall et al., 2011; Leatherdale & Ahmed, 2010). The interviews linked substance use amongst youth generally, and tobacco use specifically, to coping with stress.

The multivariate analysis of these other substance-related health behaviours found that their significance generally remained when controlling for other factors: youth drinkers who did not binge drink in the past year had odds of not smoking cigarettes that were 3.54 times as high as those who did binge drink. Youth who did not use any other drugs in the past year (illicit drugs or the misuse of prescriptions) had 18.29 times the odds of being non-smokers compared to youth who had used other drugs. Only alcohol use lost significance when controlling for other factors within the domain.

### **Family Factors**

Bivariate analyses also identified key family factors that are protective for smoking First Nations youth living on reserves. These include living in a smoke free-home (three-quarters of youth who live in a smoke-free home do not smoke), and four out of five youth do not smoke if their family has not experienced Residential Schooling, they live in an uncrowded house, their father is employed full time, or one of their parents has a high school diploma or education beyond high school. The literature generally supports these findings (Doucette, 2007; Ryan et al., 2016). Similarly, the 2016 FNIGC youth smoking report found that living in a smoke-free home was protective.

Overall, the interviews highlighted the impact of the broad Indigenous social determinants of health, and specifically the impacts of colonization, on family stability and its importance on youth smoking behaviours, indicating that family members serve as role models and primary support for youth. They mentioned as well that connection to community generally, including family, school, and others, is protective. There is support within the literature for this broadly (Firestone et al., 2015; Lemstra et al., 2011; Ryan et al., 2016).

Interestingly, youth smoking behaviour is not statistically related to mother's employment status. An interviewee stated that this may possibly be explained by the reality that women who are not in the labour force are fully engaged in child rearing and household management, not idle. They generally shared that increased parental education resulted in more open dialogue with their children. As well, the family structure of First Nations youth is not related



to smoking behaviour. Youth who live in families with two biological parents, one biological parent, or any other family form are equally likely, on average, to be non-smokers. This is not the same finding as in the 2016 FNIGC youth smoking report or the interviews. The interviews added that a stable home life contributed to increased self-esteem among youth, and therefore a decreased likelihood of smoking. This is variously supported in the literature, as mentioned above.

Domain-specific multivariate analyses showed that three family factors continued to be protective: family having not experienced Residential Schooling (2.03 times the odds of being a non-smoker), living in a non-crowded home (1.48 times the odds of being a non-smoker), and having a father who is employed full time (youth whose fathers do not work have 0.29 times the odds of not smoking compared to youth with fathers who work full time, and youth whose fathers work part time have 0.52 times the odds of not smoking compared to youth whose fathers work full time).

### **Peer Factors**

There are highly protective peer factors for youth smoking based on the bivariate analyses outcomes. Nearly all youth (98%) who have friends who do not smoke, do not smoke themselves. For 9 out of 10 First Nations youth on reserves whose friends do not drink, the youth does not smoke, and the same applies for those whose friends do not use illicit drugs or misuse prescription drugs. The interviews identified peers as a highly influential protective or risk factor. Peer behaviour as a protective factor is also supported in the literature (Andersson and Ledogar, 2008; Hutchinson, Richardson, & Bottorff, 2008; Saewyc et al., 2006). The interviews also revealed that closer proximity to an urban centre (i.e., access and influence) could impact cigarette smoking amongst First Nations youth on reserves.

Multivariate analyses of these factors showed that all peer smoking and peer drug use continued to be significant: a youth has 40.16 times the odds of not smoking if they have friends who do not smoke, and a youth has 2.61 times the odds of not smoking if their friends do not use illicit drugs or misuse prescription drugs.

### **School Factors**

Bivariate analyses identified key school factors as protective against youth smoking. Approximately 8 out of 10 students do not smoke if they have not changed schools, alcohol or drugs are not perceived problems at school, they have high grades, and there is parental involvement in school by attending events. Having a positive school experience, reporting a positive school climate, and not reporting a neg-

ative school climate are also protective. This is supported in the 2016 FNIGC youth smoking report. The interviews similarly found that youth who stay in school are less likely to have mental health issues and therefore are less likely to take up commercial cigarette use. Again, this is generally supported by the literature (Corona et al., 2009; Scal, Ireland, & Borowsky, 2003).

An interesting finding is that being taught a First Nations language in school is not significantly associated with youth smoking behaviour, and this was not supported by the interviews. However, analysis of the Aboriginal Peoples Survey with First Nations and Métis youth off reserves found that “[r]espondents who reported speaking an Indigenous language were more likely to be current smokers, compared to those who did not speak one (28.0% vs. 17.5%)” (Ryan et al., 2016, p. 110). This was similar in an analysis of adult Aboriginal Peoples Survey Métis data (Ryan et al., 2016).

Applying multivariate analyses within this domain, four school factors continued to be protective: Youth with high grades had twice the odds of not smoking, youth whose parents are involved in attending their school events are more likely to not smoke (in comparison, those without involved parents had 0.42 times the odds of not smoking), and youth who do not smoke report a more positive school experience than smokers. Additionally, youth who changed schools one to three times (for reasons other than normal progression) had 2.23 times the odds of being non-smokers compared to those who did so four or more times (having never changed school was no longer a significant factor).

### **First Nations Traditional Culture**

The majority of the First Nations traditional culture variables were not found to be protective with bivariate analyses: these included knowledge of a First Nations language, perceived importance of learning a First Nations language, satisfaction with knowledge of traditional teachings, knowledge of the history of First Nations people, knowledge of the inherent rights of First Nations people, knowledge of the history of Residential Schools, and participation in First Nations cultural activities in the past year. One cultural factor did show to be significant for youth smoking: Approximately 7 out of 10 youth who report that it is somewhat or very important to learn about traditional teachings are non-smokers, whereas 8 out of 10 youth who report that it is only a little or not at all important to learn about traditional teachings are non-smokers. However, this difference, while statistically significant, was not large, and the significance persisted in the final logistic regression analyses only for First Nations youth attending school. There was little insight from the literature to explain this, and in fact the literature supports the opposite—that involvement



in First Nations culture is a protective health factor generally (Hutchinson, Richardson, & Bottorff, 2008; McKenzie, Fornssler, & Dell, 2016; Rowan et al., 2014).

In contrast to these findings, the 2016 FNIGC youth smoking report using RHS Phase 2 data found that participating in local community cultural events is a protective factor. The FNREEES findings may in part be explained by the interviewees' insight that commercial cigarette smoking in many reserve communities is normalized, including among traditional community leaders (e.g., Elders) and at community ceremonies (e.g., Sweat Lodge). In fact, because of this, attending cultural activities was identified as a risk factor in some interviews. There are various possible reasons for this that could be explored, such as the historical and present day cultural and spiritual significance of tobacco use influencing the normalization of commercialized cigarette smoking. Another is the use of commercial cigarettes by traditional community leaders, who are youth role models. This may also help explain why youth who report that it is somewhat or very important to learn about traditional teachings were more likely to smoke. The interviews also highlighted the critical role of traditional First Nations culture (e.g., recognition that cultural awareness is linked to positive self-identity) as a protective factor in youths' well-being. In contrast to the FNREEES findings, language was consistently identified as a protective factor because of its link to identity, self-worth, and connection to the land and creation. Concern about the inter-generational loss of culture was also expressed in the interviews, with tobacco reduction initiatives identified as a space for traditional teachings.

Logistic regression within this domain showed that one First Nations cultural factor continued to be significantly related to youth smoking: First Nations youth on reserves who do not think it is important to learn about traditional teachings have 2.05 the odds of not smoking compared to those who think it is very or somewhat important. Again, there is a need for further research to understand this. For example, disconnection from culture could relate to internalizing Western messages surrounding smoking (e.g., harmful health effects) and not feeling conflicted by attending cultural ceremonies where they are exposed to higher rates of smoking (e.g., leaders, social smoking at cultural events).

### **Well-being Factors**

Bivariate analyses identified protective well-being factors for youth to not smoke cigarettes: more than three-quarters of youth do not smoke if they report being physically active once a week or more, have a consistent sleep schedule, eat balanced meals, feel loved, do not feel stressed, and

did not feel sad, blue, or depressed in the past year. Seven out of ten youth did not smoke if they reported feeling physically healthy, feeling mentally healthy, and not feeling lonely. Also, feeling socially supported and feeling physically, mentally, socially, and spiritually balanced were identified as protective factors. These factors are supported in the 2016 FNIGC youth smoking report as well as the literature (Doucette, 2007; Firestone, Tyndall, & Fischer, 2015; Lemstra et al., 2011; Ryan et al., 2016). The interviews highlighted the role of mental health in ongoing tobacco use as a means for coping with stress. This is supported in the literature, specifically among females (Greaves & Jategaonkar, 2006). The 2016 FNIGC youth smoking report on the RHS youth tobacco data likewise reported better mental health as a protective factor, noting the finding was based on less complex analyses than with the FNREEES. It also identified not feeling lonely, feeling socially supported, and participation in physical activities as protective factors.

Multivariate analyses identified two well-being factors as continuing to be protective. Youth who reported being mentally healthy had 3.77 times the odds of being a non-smoker, and youth who did not feel sad, blue, or depressed in the past year had 1.71 times the odds of being a non-smoker.

### **Full Logistic Regression Models**

A full logistic regression model of all factors that were significant in the domain-specific multivariate analyses showed six protective factors for not smoking among First Nations youth: Youth whose fathers work full time are most likely to be non-smokers, compared to youth whose fathers do not work for pay (0.30 times the odds of not smoking); youth who do not do volunteer work in the community have 2.33 times the odds of being a non-smoker; youth who did not binge drink alcohol in the past year have 4.57 times the odds of being a non-smoker; youth who did not use illicit drugs in the past year have 8.01 times the odds of being a non-smoker; youth who have friends who do not smoke have 18.05 times the odds of being a non-smoker; and youth who report having good, very good, or excellent mental health have odds of not smoking 5.56 times as high as those with poorer mental health. It is important to consider these factors together, and with more complex statistical analyses such as this full logistic regression model, given the complexity and interrelation of the factors.

The interviews, however, revealed that anti-smoking initiatives, whether prevention, education, reduction, or cessation focussed, generally do not address other substances or broader approaches to wellness and are therefore often not accounting for Indigenous social determinants of health.



Running the same model but including school-related factors, which only apply to youth currently in school, produced many of the same findings, but somewhat stronger. There were three additional factors that showed to be protective for in-school youth. Youth were more likely to be a non-smoker if they had a higher level of perceived control (mastery), if they believe that it is not important to learn about traditional cultural teachings, and if their family members attended Residential School. The fact that family Residential School attendance switched from being a risk to a protective factor in different analyses suggests that it may be moderated by other factors which need to be studied further. The important point is that in the future, exploring First Nations youth on-reserve smoking initiatives should consider youth who are in school and those who are not.

### ***Predicted Probabilities***

And last, the predicted probabilities of being a non-smoker for some hypothetical First Nations youth with varying protective factors (i.e., the six factors found to be significant predictors of youth smoking in the full logistic regression model) were examined. A hypothetical youth with all of the protective factors has a 99.9% chance of being a non-smoker and a hypothetical youth with none of the protective factors has a 3.9% chance of not smoking.

Considering these findings, the interviews at the same time identified the importance of offering community-specific programming because each First Nation and its youth are unique. That said, two commonalities were expressed in consideration of the above identified protective factors. First, there is currently an absence of First Nations youth-specific, empirical-based, tobacco reduction initiatives. The second commonality is the presence of an Indigenous knowledge base in the offering of youth on-reserve tobacco reduction initiatives, and the distinction between sacred or cultural use of tobacco and commercial use.

Youth tobacco reduction initiatives focussed mostly on cessation of cigarette smoking as well as prevention and education. Cessation messages centre on the role of cultural and sacred tobacco use versus commercial cigarette smoking, and within the context of normalized use of cigarettes in many First Nations (Cote-Meek et al., 2014). Prevention initiatives highlight general education about the harms of non-sacred tobacco use, with specific attention paid to the importance of peer-to-peer programming. It was noted that there was nearly no attention paid to tobacco reduction, second-hand smoke, e-cigarettes and vaping, marijuana use, and chewing tobacco.

There are many possible explanations for the lack of sig-

nificance in the FNREEES for traditional First Nations cultural factors serving as protective factors against youth smoking.

First, as mentioned by the interviewees, tobacco smoking (both sacred, cultural, and commercial) is highly normalized in some communities, including at First Nations cultural activities and amongst cultural leaders. This may influence youth smoking uptake and continuation, for example, through role modelling.

Second, with culture and language variables not significant predictors of smoking behavior, this may reflect a selection effect; less healthy youth may turn to traditional culture for healing more so than healthy youth. At the same time, a youth does not need to attend ceremony to connect to their culture, and it may also be that they participate in or return to culture in their adult years.

Third, it is important to parse out the effects of living in remote locations and other factors that may influence health (smoking behaviour) and cultural engagement, and which would lead to a spurious (negative) relationship between culture and smoking. For example, one interviewee pointed out that attending First Nations cultural ceremony is not supported in some remote northern communities highly influenced by Christianity.

Fourth, it may be possible that the questions asked in the FNREEES regarding culture are not capturing what is sought to be measured. For example, the Native Wellness Assessment™ “measures the impact of cultural interventions on client wellness and proves something that First Nations have long known: culture is the key to restoring and maintaining wellness” (Thunderbird Partnership Foundation, 2018b, para. 5). Instead of a Western-influenced questionnaire, the questions in this assessment reflect Indigenous knowledge and conceptions of wellness. Examples of questions include “Ceremonies and cultural activities open me up to share my thoughts and feelings with others,” “The more I learn about my culture, the more confident I feel about my life,” and “I listen to traditional teachings to learn how my ancestors understood and lived life” (Thunderbird Partnership Foundation, 2015, p. 4, 6).

Fifth, the literature speaks to the need to further look at current youth Indigenous identity, and notes that it may be necessary to combine Indigenous and Western worldviews (Dell et al., 2011; Hall et al., 2015).

In general, there is a need for First Nations youth to know their cultural background and participate in ceremony; the interviews shared that this is well established within communities and not specific to youth who smoke.



As mentioned, much of the programming that has been developed for First Nations youth in addictions and mental health generally has been grounded in Eurocentric models of risk and resiliency. It is well established that solutions to problematic substance use among First Nations youth need to be culturally specific and rooted in Indigenous and Western ways of knowing, with priority given to the former. The *First Nations Mental Wellness Continuum Framework* (FNMWCF) recognizes the balance of mental, physical, spiritual, and emotional wellness factors in First Nations communities in the offering of mental health and addictions programming (Health Canada & AFN, 2015). With this understanding in mind, it may be worth considering whether it is possibly overreaching to suggest that participation in culture by itself is going to impact youths' smoking behaviors as a single outcome. If wellness is understood as a holistic concept, that is, from a First Nations worldview, then it may not make sense to separate smoking behaviors from other health behaviors. Further, examining certain well-being factors together in any analysis may be important; for example, by creating a composite that tackles 'cultural engagement' by combining the variables in such a way that they assess the same underlying domain to create a more meaningful variable (as opposed to looking at the questions in isolation). There is a need to account for Indigenous and Western ways of knowing, with priority given to the former, as it is inherently strengths-based, in contrast to the typical deficit-based Western Eurocentric model.

Related to this suggestion, and referring to the guidance offered by the TRC, this is an important opportunity that needs to be recognized in a range of Indigenous-specific activities, including the findings of this report. According to the TRC,

*[R]econciliation is about establishing and maintaining a mutually respectful relationship between Aboriginal and non-Aboriginal peoples in this country. In order for that to happen, there has to be awareness of the past, acknowledgement of the harm that has been inflicted, atonement for the causes, and action to change behavior." (2015b, p. 6–7)*

It is important to have data, both quantitative and qualitative, to guide such action. The findings from this report can support this effort, with guidance offered specifically by Calls to Action #18 and #19. The findings can also be linked with other Canadian initiatives, such as the renewed Federal Tobacco Control Strategy, that "support the development and implementation of comprehensive tobacco control projects that are holistic, and socially and culturally

appropriate" (Health Canada, 2017, p. 13).

## Recommendations

Characteristic of all research, there are several limitations associated with this report. Key limitations include (1) although gender needs to be considered on a continuum, the survey itself did not allow for this and the quantitative data is only able to be analyzed by sex;<sup>12</sup> (2) the FNREEES youth survey captures youth age 12 to 17, but smoking may start younger than this age range (interviews noted that some prevention programming does); and (3) the individuals interviewed for the qualitative portions of this report are not representative of all First Nations community youth tobacco program staff.

Based on the findings of this report, four key suggestions for data collection and analysis and First Nations youth tobacco reduction initiatives are presented:

## Data

- Collect survey data on youth who try smoking but do not continue, including by sex and gender when possible.
- Add questions to the survey about second-hand smoke, pregnancy, the influence of emerging technology such as social media, the distinction between traditional and commercial tobacco use, and tobacco products other than cigarettes.
- Continue to learn from community practices via qualitative data collection.
- Revisit the wording of the First Nations traditional culture questions and add a question specific to hope (and revisit those related to meaning, purpose and belonging) so that one can create a measure for First Nations Mental Wellness based upon the FNMWCF.

## First Nations Youth Tobacco Reduction Initiatives

- Recognize that "no door is the wrong door" to access smoking supports, and as such, programming needs to not silo tobacco services for youth.
- Recognize the influential role of adults and cultural leaders (role models and normalized cigarette smoking in communities).

<sup>12</sup> Many surveys are not able to collect data by genders beyond male and female because the non-binary gender populations are too small to analyze the data.



- Develop and make accessible an environmental scan of evidence-based First Nations youth tobacco reduction initiatives that are developed by, for and with communities and youth so other communities can benefit. Reference to the Leading Practices in First Nations, Inuit, and Métis Smoking Cessation: Canadian Program Scan Results Version 2.0 (Canadian Partnership Against Cancer, 2016) may be of assistance. When appropriate, attention should be given to the fact that the non-First Nations rate of cigarette smoking amongst youth is considerably lower in comparison.
- Recognize when gender-informed approaches are necessary to account for the different pathways to smoking behaviours. Refer to the Centre of Excellence for Women's Health's publication, *Sex, Gender and Tobacco* (2018) for guidance.

Overall, the findings and conclusions of this report support those of the 2016 FNIGC youth smoking report on the topic: "There is a need for further strength-based research into these factors in order to better understand how they can be leveraged in programs aimed at preventing smoking among youth living on-reserve and in northern communities" (FNIGC, 2016, p. 3).





## References



- Amos, A., Greaves, L., Nichter, M., & Bloch, M. (2012). Women and tobacco: a call for including gender in tobacco control research, policy and practice. *Tobacco Control*, 21(2): 236–243.
- Andersson, N., & Ledogar, R. J. (2008). The CIET Aboriginal Youth Resilience Studies: 14 Years of Capacity Building and Methods Development in Canada. *Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health*, 6(2), 65–88. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2942846/>
- Azagba, S., & Asbridge, M. (2013). School connectedness and susceptibility to smoking among adolescents in Canada. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*, 15(8), 1458–1463. doi:10.1093/ntr/nts340. <https://www.ncbi.nlm.nih.gov/pubmed/23322767>
- Bureau of Labor Statistics. (n.d.). Pearlman Mastery Scale IRT Item Parameter Estimates, Scores and Standard Errors with Custom Weighted Z-Scores and Percentile Ranks. National Longitudinal Surveys. <https://www.nlsinfo.org/sites/nlsinfo.org/files/attachments/141120/Pearlman%20Documentation%20with%20IRT.pdf>
- Bottorff, J. L., Haines-Saah, R., Kelly, M. T., Oliffe, J. L., Torchalla, I., Poole, N., Greaves, L., Robinson, C. A., Ensom, M. H., Okoli, C. T., Craig Phillips, J. (2014). Gender, smoking and tobacco reduction and cessation: a scoping review. *International Journal for Equity in Health*, 13(114), 1–15. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4297403/>
- Bougie, E., & Kohen, D. (2018). Smoking Among Off-Reserve First Nations, Métis, and Inuit High School Students. *The International Indigenous Policy Journal*, 9(2), 1–30.
- Canadian Institutes of Health Research (CIHR). Institute of Gender and Health. (2015). *Definitions of Sex and Gender*. <http://www.cihr-irsc.gc.ca/e/47830.html>
- Canadian Partnership Against Cancer (CPAC). (2015). *Leading Practices in First Nations, Inuit and/or Métis Smoking Cessation Program Scan Results*. <https://www.partnershipagainstcancer.ca/topics/leading-practices-first-nations-inuit-metis-smoking-cessation/>
- Canadian Partnership Against Cancer (CPAC). (2016). *Leading Practices in First Nations, Inuit and/or Métis Smoking Cessation Program Scan Results Version 2.0*. <https://www.partnershipagainstcancer.ca/topics/leading-practices-first-nations-inuit-metis-smoking-cessation/>
- Centre of Excellence for Women's Health. (2018). *Sex, Gender and Tobacco*. Vancouver. <http://bccewh.bc.ca/wp-content/uploads/2018/02/TGSInfo-Sheet-SexGenderTobacco021418.pdf>
- Chen, C., et al. (2014). Active and Passive Smoking with Breast Cancer Risk for Chinese Females: A Systematic Review and Meta-analysis. *Chinese Journal Of Cancer*, 33(6): 306–316.
- Corona, R., Turf, E., Corneille, M. A., Belgrave, F. Z., & Nasim, A. (2009). Risk and Protective Factors for Tobacco Use Among 8th- and 10th-Grade African American Students in Virginia. *Preventing Chronic Disease*, 6(2), A45. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2687851/>
- Cote-Meek, S., Isaac-Mann, S., Eshkakogan, N., Selby, P., Smith, E., Martin, T., Karacsonyi, E., & White, T. (2014). [Presentation slides] *Understanding Tobacco Use Amongst Youth in Four First Nations*. <http://thunderbirdpf.org/3775-2/>
- Cotton, J., & Laventure, M. (2013). Early Initiation to Cigarettes, Alcohol and Drugs Among Innu Preadolescents of Quebec. *The Canadian Journal of Native Studies*, 33(1), 1–15.
- De Finney, S., Janyst, P., & Greaves, L. (2009). *Aboriginal Adolescent Girls and Smoking: A Qualitative Study*. Vancouver: British Columbia Centre of Excellence for Women's Health. [http://bccewh.bc.ca/wp-content/uploads/2014/02/2009\\_AboriginalAdolescentGirlsSmoking.pdf](http://bccewh.bc.ca/wp-content/uploads/2014/02/2009_AboriginalAdolescentGirlsSmoking.pdf)
- De Finney, S., Janyst, P., Greaves, L., Hemsing, N., Jategaonkar, N., Browne, A., Devries, K., Johnson, J., & Poole, N. (2013). "I Had to Grow up Pretty Quickly": Social, Cultural, and Gender Contexts of Aboriginal Girls' Smoking. *Pimatisiwin: A Journal of Aboriginal and Indigenous Community Health*, 11(2) <http://www.pimatisiwin.com/online/wp-content/uploads/2013/10/01deFinneyGreaves.pdf>



- Dell, C. (2007). Women and Substance Use Research in Canada. In Poole, N. and Greaves, L. (Eds.). *Highs & Lows: Canadian Perspective on Women's Substance Use*. Toronto: Centre for Addiction and Mental Health. pp. 495–506. [http://www.camhx.ca/Publications/Resources\\_for\\_Professionals/Highs\\_Lows/index.html](http://www.camhx.ca/Publications/Resources_for_Professionals/Highs_Lows/index.html)
- Dell, C., Seguin, M., Hopkins, C., Tempier, R., Duncan, R., Dell, D., Mehl-Madrona, L., Mosier, K. (2011). From Benzos to Berries: How Treatment Offered at an Aboriginal Youth Solvent Abuse Treatment Centre Highlights the Important Role of Culture. In Review Series. *Canadian Journal of Psychiatry*, 56(2), pp. 75–83. <https://www.ncbi.nlm.nih.gov/pubmed/21333034>
- Doucette, M. (2007). *A Study of the Social Factors Contributing to Youth Smoking in an Inuit Community* (Order No. MR33586). Available from ProQuest Dissertations & Theses Global. (304717145).
- Elton-Marshall, T., Leatherdale, S., & Burkhalter, R. (2011). Tobacco, alcohol and illicit drug use among Aboriginal youth living off-reserve: results from the Youth Smoking Survey. *Canadian Medical Association Journal*, 183(8), E480-E486. <http://www.cmaj.ca/content/183/8/E480.short>
- Firestone, M., PhD., Tyndall, M., M.D., & Fischer, B., PhD. (2015). Substance Use and Related Harms Among Aboriginal People in Canada: A Comprehensive Review. *Journal of Health Care for the Poor and Underserved*, 26(4), 1110–1131.
- First Nations Information Governance Centre (FNIGC). (2016). *Youth Resilience and Protective Factors Associated with Smoking in First Nations Communities*. Ottawa, ON: First Nations Information Governance Centre. [https://fnigc.ca/wp-content/uploads/2020/09/9d77949af9a082da444c3e1afb8a8ab2\\_FNIGC-Research-Series-Youth-Smoking.pdf](https://fnigc.ca/wp-content/uploads/2020/09/9d77949af9a082da444c3e1afb8a8ab2_FNIGC-Research-Series-Youth-Smoking.pdf)
- Glynn, T. J. (1989). Essential Elements of School-Based Smoking Prevention Programs. *Journal of School Health*, 181–188. <http://onlinelibrary.wiley.com/doi/10.1111/j.1746-1561.1989.tb04698.x/abstract>
- Government of Canada; Indigenous and Northern Affairs Canada; Communications Branch. (2010). Highlights from the Report of the Royal Commission on Aboriginal Peoples. <https://www.rcaanc-cirnac.gc.ca/eng/1100100014597/1572547985018>
- Greaves, L. (1996). *Smoke Screen: Women's Smoking and Social Control*. Halifax: Fernwood.
- Greaves, L. (2015). The Meanings of Smoking to Women and Their Implications for Cessation. *International Journal of Environmental Research and Public Health*, 12(2): 1449–1465.
- Greaves, L., Hemsing, N., Poole, N., Bialystok, L., & O'Leary, R. (2016). From Fetal Health to Women's Health: Expanding the Gaze on Intervening on Smoking During Pregnancy. *Critical Public Health*, 26(2): 230–238.
- Greaves, L. & Jategaonkar, N. (2006). Tobacco Policies and Vulnerable Girls and Women: Toward a Framework for Gender Sensitive Policy Development. *Journal of Epidemiology and Community Health*, 60 (supplement 2): 1157–1165.
- Greaves, L. & Poole, N. (2007). Highs & Lows: Introduction. In Poole, N. and Greaves, L. (Eds.). *Highs & Lows: Canadian Perspective on Women's Substance Use*. Toronto: Centre for Addiction and Mental Health. pp. 495–506. [http://www.camhx.ca/Publications/Resources\\_for\\_Professionals/Highs\\_Lows/introduction.html](http://www.camhx.ca/Publications/Resources_for_Professionals/Highs_Lows/introduction.html)
- Hall, L., Dell, C., Fornssler, B., Hopkins, C., Mushquash, C., Rowan, M. (2015). Research as Cultural Renewal: Applying Two-Eyed Seeing in a Research Project about Cultural Interventions in First Nations Addictions Treatment. *The International Indigenous Policy Journal*, 6(2): 1–15. <http://ir.lib.uwo.ca/cgi/viewcontent.cgi?article=1229&context=iipj>
- Health Canada. (2017) *Seizing the Opportunity: The Future of Tobacco Control in Canada*. <https://www.canada.ca/content/dam/hc-sc/documents/programs/future-tobacco-control/future-tobacco-control-consultation-eng.pdf>
- Health Canada & Assembly of First Nations (AFN). (2015). *First Nations Mental Wellness Continuum Framework*. [http://nnapf.com/wp-content/uploads/2015/01/24-14-1273-FN-Mental-Wellness-Framework-EN05\\_low.pdf](http://nnapf.com/wp-content/uploads/2015/01/24-14-1273-FN-Mental-Wellness-Framework-EN05_low.pdf)
- Hutchinson, P. J., Richardson, C. G., & Bottorff, J. L. (2008). Emergent Cigarette Smoking, Correlations with Depression and Interest in Cessation Among Aboriginal Adolescents in British Columbia. *Canadian Journal of Public Health*, 99(5): 418–22.



- Huxley, R. R. and Woodward, M. (2011). Cigarette Smoking as a Risk Factor for Coronary Heart Disease in Women Compared with Men: A Systematic Review and Meta-analysis of Prospective Cohort Studies. *Lancet* (London, England), 378(9799): 1297–1305.
- Johnson, K. C., et al. (2009). *Active Smoking and Secondhand Smoke Increase Breast Cancer Risk: The Report of the Canadian Expert Panel on Tobacco Smoke and Breast Cancer Risk*. Tobacco control: p. tc. 2010.035931.
- Leatherdale, S. T., & Ahmed, R. (2010). Alcohol, Marijuana, and Tobacco Use Among Canadian Youth: Do We Need More Multi-Substance Prevention Programming? *Journal of Primary Prevention*, 31(3): 99–108. DOI: <http://dx.doi.org/10.1007/s10935-010-0211-y> <https://www.ncbi.nlm.nih.gov/pubmed/20352492>
- Lee, M.H., et al. (2011). Gender Differences in the Association Between Smoking and Dyslipidemia: 2005 Korean National Health and Nutrition Examination Survey. *Clinica Chimica Acta*, 412(17/18): 1600–1605.
- Lemstra, M., Rogers, M., Thompson, A., Moraros, J., & Tempier, R. (2011). Prevalence and risk indicators of smoking among on-reserve First Nations Youth. *Paediatrics & Child Health*, 16(10): e71–e77. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3225482/>
- Loppie Reading, C., & Wien, F. (2009). *Health Inequalities and Social Determinants of Aboriginal Peoples' Health*. [http://www.nccah-ccnsa.ca/docs/social%20determinates/nccah-loppie-wien\\_report.pdf](http://www.nccah-ccnsa.ca/docs/social%20determinates/nccah-loppie-wien_report.pdf)
- McKenzie, H., Fornssler, B., & Dell, C. (2016). Understanding Addictions among Indigenous People through Social Determinants of Health Frameworks and Strength-Based Approaches: A Review of the Research Literature from 2013 to 2016. *Current Addiction Report*, 3: 378–386. DOI:10.1007/s40429-016-0116-9. <https://link.springer.com/article/10.1007/s40429-016-0116-9>
- Robinson, Margaret. (2017). Two-Spirit and Bisexual People: Different Umbrella, Same Rain. *Journal of Bisexuality*, 17: 1, 7-29. DOI: 10.1080/15299716.2016.1261266. <https://www.randfonline.com/doi/pdf/10.1080/15299716.2016.1261266>
- Rowan, M., Poole, N., Shea, B., Mykota, D., Farag, M., Hopkins, C., Hall, L., Mushquash, C., Fornssler, B., & Dell, C. (2014). Cultural Interventions to Treat Addictions in Indigenous Populations: Findings from a Scoping Study. *Substance Abuse Treatment, Prevention, and Policy*, 9(34): 1–26. DOI: 10.1186/s13011-015-0021-6. <https://substanceabusepolicy.biomedcentral.com/articles/10.1186/1747-597X-9-34>
- Ryan, C., Leatherdale, S., & Cooke, M. J. (2016). Factors Associated With Current Smoking Among Off-Reserve First Nations and Métis Youth: Results From the 2012 Aboriginal Peoples Survey. *Primary Prevention*, 105–119. DOI 10.1007/s10935-016-0456-1 <https://pubmed.ncbi.nlm.nih.gov/27878418/>
- Saewyc, E., Wang, N., Chittenden, M., Murphy, A., & The McCreary Centre Society. (2006). *Building Resilience in Vulnerable Youth*. Vancouver, BC: The McCreary Centre Society. [http://www.mcs.bc.ca/pdf/vulnerable\\_youth\\_report.pdf](http://www.mcs.bc.ca/pdf/vulnerable_youth_report.pdf)
- Scal, P., Ireland, M., & Borowsky, I. W. (2003). Smoking Among American Adolescents: A Risk and Protective Factor Analysis. *Journal of Community Health*, 28: 79–97. DOI: 10.1023/A:1022691212793. <https://link.springer.com/article/10.1023%-2FA%3A1022691212793?LI=true>
- Stewart, M. J., Greaves, L., Kushner, K. E., Letourneau, N. L., Spitzer, D. L., & Boscoe, M. (2011). Where There is Smoke, There is Stress: Low-Income Women Identify Support Needs and Preferences for Smoking Reduction. *Health Care for Women International*, 32(5): 359–383. DOI: 10.1080/07399332.2010.530724.
- Thunderbird Partnership Foundation (TPF). (2015). *Native Wellness Assessment, Self-Report Form*. [http://www.thunderbirdpf.org/wp-content/uploads/2016/04/NWA-S\\_RE4\\_Apr5\\_WEB.pdf](http://www.thunderbirdpf.org/wp-content/uploads/2016/04/NWA-S_RE4_Apr5_WEB.pdf)
- Thunderbird Partnership Foundation (TPF). (2018a). *History of the Thunderbird Partnership Foundation*. <http://thunderbirdpf.org/about-tpf/tpf-history/>
- Thunderbird Partnership Foundation (TPF). (2018b). *Native Wellness Assessment*. <http://thunderbirdpf.org/about-tpf/scope-of-work/native-wellness-assessment/>
- Truth and Reconciliation Commission of Canada (TRC). (2015a). *Honouring the Truth, Reconciling for the Future: Summary of the Final Report of the Truth and Reconciliation Commission of Canada*. [http://publications.gc.ca/collections/collection\\_2015/trc/IR4-7-2015-eng.pdf](http://publications.gc.ca/collections/collection_2015/trc/IR4-7-2015-eng.pdf)



Truth and Reconciliation Commission of Canada (TRC). (2015b). *Truth and Reconciliation Commission of Canada: Calls to Action*. [http://trc.ca/assets/pdf/Calls\\_to\\_Action\\_English2.pdf](http://trc.ca/assets/pdf/Calls_to_Action_English2.pdf)

Unger, J. B., Toto, C., & Baezconde-Garbanati, L. (2006). Perceptions of ceremonial and nonceremonial uses of tobacco by American-Indian adolescents in California. *Journal of Adolescent Health*, 38(4): 443.e9–443.e16. DOI: 10.1016/j.jadohealth.2005.02.002





## Appendix A: Comparison of findings in FNIGC Youth tobacco reports based on RHS Phase 2 and FNREEES data

Factor	RHS 2008/10 bi-variate analysis <sup>13</sup>	FNREEES 2013/15			
		Bivariate analysis	Multivariate analysis within factor type	Full logistic regression (all youth)	Full logistic regression (youth in school only)
<b>Sex = male</b>	Protective	Protective	n.s.	N/A	N/A
<b>Age category = 12-14 years old</b>	Protective	Protective*	Protective	n.s.	n.s.
<b>Community remoteness</b>	Risk	N/A	N/A	N/A	N/A
<b>Community size</b>	Not significant (n.s.)	N/A	N/A	N/A	N/A
<b>Better self-rated general health</b>	Protective	N/A	N/A	N/A	N/A
<b>Better self-rated physical health</b>	N/A	Protective	n.s.	N/A	N/A
<b>Better self-rated mental health*</b>	Protective	Protective	Protective	Protective	Protective
<b>Never felt sad/blue/depressed in past year</b>	N/A	Protective	Protective	n.s.	n.s.
<b>Ever had suicidal thoughts</b>	Risk	N/A	N/A	N/A	N/A
<b>Ever attempted suicide</b>	Risk	N/A	N/A	N/A	N/A
<b>Alcohol in past 12 months</b>	Risk	Risk	n.s.	N/A	N/A
<b>5+ drinks in past 12 months</b>	Risk	Risk	Risk	Risk	Risk
<b>Marijuana &amp; other illicit drug use &amp; prescription drug misuse</b>	N/A	Risk	Risk	Risk	Risk
<b>Sexually active</b>	Risk	N/A	N/A	N/A	N/A
<b>Get regular sleep more often</b>	N/A	Protective	n.s.	N/A	N/A
<b>Eat a balanced diet more often</b>	N/A	Protective	n.s.	N/A	N/A
<b>Friends do not smoke</b>	N/A	Protective	Protective	Protective	Protective
<b>Friends do not drink alcohol</b>	N/A	Protective	n.s.	N/A	N/A
<b>Friends do not use drugs</b>	N/A	Protective	Protective	n.s.	n.s.
<b>Feeling lonely*</b>	Risk	Risk	n.s.	N/A	N/A
<b>Feeling loved*</b>	Protective	Protective	n.s.	N/A	N/A
<b>Feeling stressed*</b>	Risk	Risk	n.s.	N/A	N/A
<b>Higher perceived social support*</b>	Protective	Protective	n.s.	N/A	N/A
<b>Higher feelings of mastery*</b>	Protective	Protective	Protective	n.s.	Protective
<b>Higher self-esteem</b>	Protective	N/A	N/A	N/A	N/A

<sup>13</sup> See full report at [https://fnigc.ca/wp-content/uploads/2020/09/9d77949af9a082da444c3e1afb8a8ab2\\_FNIGC-Research-Series-Youth-Smoking.pdf](https://fnigc.ca/wp-content/uploads/2020/09/9d77949af9a082da444c3e1afb8a8ab2_FNIGC-Research-Series-Youth-Smoking.pdf) for details.



Factor	RHS 2008/10 bi-variate analysis <sup>13</sup>	FNREEES 2013/15			
		Bivariate analysis	Multivariate analysis within factor type	Full logistic regression (all youth)	Full logistic regression (youth in school only)
Feel in balance physically, mentally, emotionally, and spiritually	N/A	Protective	n.s.	N/A	N/A
Participation in sports teams/lessons	Protective	N/A	N/A	N/A	N/A
Physically active more often	N/A	Protective	n.s.	N/A	N/A
Volunteer in community	N/A	Risk	Risk	Risk	Risk
Work for pay	N/A	n.s.	N/A	N/A	N/A
Living with biological parent(s)	Protective	n.s.	N/A	N/A	N/A
Ever been in foster care	N/A	Risk	n.s.	N/A	N/A
Higher parental education level	Protective	Protective	n.s.	N/A	N/A
Mother/female guardian employed full time	N/A	n.s.	N/A	N/A	N/A
Father/male guardian employed full time	N/A	Protective	Protective	Protective	Protective
Family Residential School attendance*	Risk	Risk	Risk	n.s.	Protective
Smoke-free home*	Protective	Protective	n.s.	N/A	N/A
Crowded home	N/A	Risk	Risk	n.s.	n.s.
Parents attend school events	N/A	Protective	Protective	N/A	n.s.
Currently attending school	Protective	Protective	n.s.	n.s.	n.s.
Higher grades (As or Bs) in school	N/A	Protective	Protective	N/A	n.s.
Positive attitude toward postsecondary education	N/A	Protective	n.s.	N/A	N/A
Fewer/no times changing schools for reasons other than regular progression	N/A	Protective	Protective	N/A	n.s.
Positive school experience	N/A	Protective	Protective	N/A	n.s.
Like school	Protective	N/A	N/A	N/A	N/A
Problems learning in school	Risk	N/A	N/A	N/A	N/A
Experienced bullying	n.s.	N/A	N/A	N/A	N/A
No perceived alcohol problem in school	N/A	Protective	n.s.	N/A	N/A
No perceived drug problem in school	N/A	Protective	n.s.	N/A	N/A
Positive school climate	N/A	Protective	n.s.	N/A	N/A
Negative school climate	N/A	Risk	n.s.	N/A	N/A
Ever taught a First Nations language in school	N/A	n.s.	N/A	N/A	N/A
Ever had a First Nations teacher	N/A	n.s.	N/A	N/A	N/A



Factor	RHS 2008/10 bi-variate analysis <sup>13</sup>	FNREEES 2013/15			
		Bivariate analysis	Multivariate analysis within factor type	Full logistic regression (all youth)	Full logistic regression (youth in school only)
Any knowledge of a First Nations language	N/A	n.s.	N/A	N/A	N/A
Higher perceived importance of speaking/understanding First Nations language*	n.s.	n.s.	N/A	N/A	N/A
Higher satisfaction with knowledge of traditional teachings	N/A	n.s.	N/A	N/A	N/A
Higher perceived importance of learning about traditional teachings	N/A	Risk	Risk	n.s.	Risk
More knowledge about the history of one's people	N/A	n.s.	N/A	N/A	N/A
More knowledge about the inherent rights of one's people	N/A	n.s.	N/A	N/A	N/A
More knowledge about the history of Residential School	N/A	n.s.	N/A	N/A	N/A
Take part in community cultural events/First Nations cultural activities*	Protective	n.s.	N/A	N/A	N/A
Participate in traditional dancing/singing/drumming	n.s.	N/A	N/A	N/A	N/A
Higher perceived importance of traditional cultural events	n.s.	N/A	N/A	N/A	N/A

\* Indicates a factor for which significance was determined based on slightly different question wording, response option grouping, or composite score calculation in the RHS vs. FNREEES analysis.



## Appendix B: Author Biographies

**Dr. Colleen Ann Dell** (PhD) was appointed a Centennial Enhancement Chair in One Health and Wellness at the University of Saskatchewan in 2016, with a focus on addiction and mental health. Her position was renewed for a second five-year term in 2021. She is also a Senior Research Associate with the Canadian Centre on Substance Abuse, Canada's national non-governmental addictions agency. Dr. Dell is an Adjunct Professor in the Department of Sociology and Anthropology at Carleton University and a past Research Associate with the Indigenous Peoples' Health Research Centre.

Dr. Dell's research program is grounded in an empowering, community-based and patient-oriented participatory approach. Prior to her appointment as the Centennial Enhancement Chair in One Health and Wellness, Dr. Dell held the provincial Research Chair in Substance Abuse at the University of Saskatchewan. Funded by the Government of Saskatchewan from 2007-2016, her work concentrated on research, community outreach and training.

During this appointment, Dr. Dell secured nearly 4 million in external funding for her community engaged research program as a Principal Investigator and more than double that amount in her roles as a co-applicant and collaborator. In this work she addressed innovative areas in problematic substance use, ranging from horse assisted therapy for youth in addictions treatment to knowledge translation efforts addressing the role of identity and stigma in the healing journeys of Indigenous women from problematic substance use. Her work was successfully translated into over two dozen accessible creative and artistic forms, including music videos, paintings and fact sheets.

Underlying Dr. Dell's work is a belief in bringing different ways of knowing together into one space, with an emphasis on lived experience and Indigenous knowledge. Her commitment to facilitating the exchange of understanding was recognized in 2010 when she was awarded the YWCA Saskatoon Women of Distinction Award with colleague Dr. Sharon Acoose from the First Nations University of Canada in the category of Research, Science and Technology.

**Dr. Laura Wright** (PhD) is an Assistant Professor at the University of Saskatchewan who specializes in family demography, transitions to adulthood, and health. She has published work on health behaviour trajectories over the transition to adulthood including smoking and drinking, and older adult spouses' joint smoking cessation behaviours. She has extensive experience using a wide variety of advanced statistical methods including generalized linear modelling, event history analysis, and latent variable models, and has authored two textbook chapters on the application of qualitative and quantitative research methods.

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