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***Youth risk and resilience in eastern Newfoundland and  
Labrador***

Dawn Caldwell

**UNIVERSIDAD AUTONOMA DE GUERRERO**

CENTRO DE INVESTIGACION DE ENFERMEDADES TROPICALES

**Youth Risk and Resilience in Eastern Newfoundland and Labrador**

A study of risk and resilience among 6622 youth from grades seven to 12 in  
Eastern Newfoundland and Labrador

Dawn Caldwell

Thesis

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PRESIDENT: \_\_\_\_\_ Dr. Robert J. Ledogar \_\_\_\_\_

SECRETARY: \_\_\_\_\_ Dr. Anne Cockcroft \_\_\_\_\_

FIRST VOCAL: \_\_\_\_\_ Dr. Kevin Brand \_\_\_\_\_

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## **Summary**

### **1. Introduction**

Both parents and the public health sector are concerned about youth risk taking. Between May 1998 and March 1999, under the umbrella of the LoPHID (Local Public Health Infrastructure Development) Project, five different public health regions in Atlantic Canada conducted a series of research cycles during which public health staff learned techniques that would facilitate their adoption of evidence-based planning. Health regions in Nova Scotia, Prince Edward Island and the province of Newfoundland and Labrador participated.

This paper compares the data gathered in two LoPHID research cycles examining youth risk behaviour conducted in Eastern Newfoundland Health and Community Services Region in 1998 and in the areas covered by Health Labrador Corporation, Sheshatshiu Innu Band Council and Davis Inlet Band Council in 1999.

This thesis has the following objectives:

1. To determine the prevalence rates of adolescent alcohol, tobacco and drug use and unsafe sexual practices in the two health regions.
2. To examine the relationship between adolescent risk taking and parenting practices.
3. To examine the association between family 'intactness' and adolescent risk taking.

## **2. Literature review**

Youth risk taking has complex causes with many interactive components. These components or events may not only arise during adolescence when the risk taking behaviour is frequently manifested but may have occurred years earlier. Existing literature suggests that some combination of current factors relating to peer activity, parenting style and emotional well being, perhaps coupled with earlier childhood experiences, influences adolescent risk taking; however, it remains difficult to identify exactly what factors and in what combination will impact a youth's decisions to partake in potentially injurious behaviour.

## **3. Methods**

The survey teams in each region collected data from adolescents in grades seven to twelve using self-administered questionnaires completed in class. To ensure respondent safety, anonymity and confidentiality, ethics boards in each region reviewed and approved the research methodology prior to its implementation. When the surveys were implemented, researchers informed adolescents that their participation was voluntary, that they could omit any questions they wished and that they could stop at any time. I subsequently combined the data from the two regions into one data set and used Epi Info and CIETmap software to complete our analysis.

The analysis of associations between study factors followed procedures outlined by Mantel and Haenszel. I expressed any observed associations as odds ratios describing the likelihood of an outcome occurring in the exposed group compared with the unexposed group. To describe the significance of these associations, I used Cornfield's 95% confidence intervals. I used

stratification to identify confounding variables and describe effect modification. When confounding occurred, I reported the Mantel and Haenszel weighted odds ratio with its corresponding 95% confidence interval. I used Woolf's P-value to identify effect modification across strata. When effect modification occurred, I reported the association between exposure and outcome for each strata expressed as an odds ratio with accompanying confidence interval. As a final step, using CIETmap software, I completed logistic regression models for factors related to each of the identified risk behaviours; drinking, smoking, drug use and unsafe sex.

#### **4. Results**

A total of 4894 students from 24 schools in Eastern Newfoundland and 1728 students from 10 schools in Labrador participated. Rates of smoking, drinking and drug use were consistent with those from a study conducted a year earlier. Some 28% of the respondents reported multiple risk behaviours (smoking, drinking, and/or drug use). While a higher proportion of older adolescents reported multiple risk behaviours, the association between risk behaviours was stronger among respondents under the age of sixteen.

I found a relationship between each of the risk behaviours and peer substance use. Although older adolescents were more likely to report having many risk taking friends, the association between risk behaviour and having risk taking friends was stronger among those under the age of fifteen. I also found an association between exposure to unwanted sexual activity and risk taking which was also stronger among those under the age of sixteen.

I found a number of parental activities had a protective association with risk taking. Parental knowledge of a child's whereabouts, consistent rule setting and consistent discipline all protected against smoking, drinking, drug use and unsafe sexual activity. Family intactness and group membership were also protective.

## **5. Discussion**

Findings in the present survey did not contradict existing literature. Evidence of a risk behaviour syndrome emerged. Tobacco, alcohol and drug use were associated with each other and with unsafe sexual activity. Tobacco, alcohol and drug use were also associated with having many peers who drank and/or used drugs. These associations were stronger among those under sixteen.

Family intactness protected against risk behaviour. The protective mechanism behind family intactness in this study is not fully understood; however children from intact households were more likely to report that their parents usually knew their whereabouts, that their parents consistently set rules and disciplined consistently compared with adolescents from non-intact households indicating perhaps that parents from intact households are either more motivated or better equipped to remain knowledgeable about and/or influence their child's activities.

Parenting can impact adolescent risk taking. Risk taking (smoking, drinking, drug use and unsafe sex) occurred at lower rates among those who perceived that their parents usually knew their whereabouts, set rules and punished consistently.

Group membership protected against adolescent smoking, substance use and unsafe sex. This protectiveness may result from the timing of group activities. It may be that group activities occur mostly after school providing supervision to group members during a time of day when parental monitoring activities may be less rigorous.

This study had several limitations. Self-reporting may have led to under reporting of risk behaviours. With the exception of one community in Labrador, the research teams administered surveys only to those attending school. Peer substance use and measurement of parental knowledge and control were based on adolescent perceptions. I did not have access to household socioeconomic information nor could I address the impact of responsive parenting or parental modelling (the adolescent modelling their behaviour on the behaviour of the parent) on adolescent risk taking.

## **6. Recommendations**

The inevitability of youth risk does not mean that it cannot be addressed. Primary interventions aimed at educating youth may prevent some adolescents from ever taking risks. Other community based interventions may protect those current risk takers not influenced by previous educational efforts. Still other interventions can strengthen family interactions and parenting skills that either limit risk taking or limit the circumstances under which it can occur.

Educational programmes should continue in that they do a good job informing youth about the risks associated with smoking, drinking, drug use and unsafe sex; however, adolescents

suggested that interventions should not “tell them what to do” and should be realistic.

More community stakeholder involvement would protect those at immediate risk from factors extraneous to their substance use (such as driving with someone who is drunk) and could identify those with more serious substance abuse problems. Community stakeholders prevention efforts should focus on protection and not punishment. Fear of punishment or parental disappointment may prevent adolescents from seeking assistance from an adult/authority figure when they need it. Existing suicide related programs that make it easier for adolescents to seek help without questions might serve as a template for a similar programmes that address youth risk taking.

Parents may be under the impression that there is little they can do to impact the behaviour of their children; however, in this study, both parental knowledge of youth activities and whereabouts and parental control (setting rules and disciplining) were associated with reduced substance use, not smoking and less unsafe sex. Within the context of limiting risk taking opportunities, the protective impact of supervised group activities deserves special mention. Parents who encourage group activity can instill structure and safety in their child’s life in ways that appear supportive rather than restrictive and at the same time provide an environment that is conducive to social skill building.

More detailed measurement of the protectiveness of group membership, parental knowledge and parental control would benefit parenting programmes and help to clarify the roles that parental responsiveness and demandingness play in adolescent resilience.

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## **1. Introduction**

Both parents and the public health sector are concerned about youth risk taking. Adolescents continue to smoke in the presence of anti smoking campaigns. Injury remains the largest cause of death among adolescents and many injuries and deaths caused by injury are related to substance abuse. Youth continue to practice unsafe sex even when faced with the threat of HIV/AIDS and other sexually transmitted diseases.

Between May 1998 and March 1999, under the umbrella of the LoPHID (Local Public Health Infrastructure Development) Project, five different public health regions in Atlantic Canada conducted a series of research cycles during which public health staff learned techniques that would facilitate their adoption of evidence-based planning. Health regions in Nova Scotia, Prince Edward Island and the province of Newfoundland and Labrador participated.

Personnel from each health region chose the topics to be researched in their area. In some cases, a topic researched in one area was subsequently chosen by another region as a research topic.

Integral to the LoPHID Project was the intention that a survey used by one region be available to other regions in the area, streamlining the questionnaire development process while accommodating regional modifications. By sharing their experiences, the health regions were able to refine research questionnaires from cycle to cycle. In this way, questionnaires could be fine tuned and improved with each iteration yet remain similar enough to allow meaningful comparisons between the health regions. This paper compares the data gathered in two LoPHID research cycles conducted in the Eastern Newfoundland Health and Community Services Region

in 1998 and in the areas covered by Health Labrador Corporation, Sheshatshiu Innu Band Council and Davis Inlet Band Council in 1999. Both cycles examined youth risk behaviours; specifically, smoking, drinking, drug use and unsafe sex.

This paper has the following objectives:

- 1 To determine the prevalence rates of adolescent alcohol, tobacco and drug use and unsafe sexual practices in the two health regions
2. To examine the relationship between adolescent risk taking and parenting practices.
3. To examine the association between family 'intactness' and youth risk taking.

## **2. A review of existing literature**

Attempts to explain youth risk taking and learn about the predictors of risk taking have identified a causal mechanism including psycho social factors which may account for adolescent experimentation with tobacco, alcohol and drugs with the potential to progress to regular use.

### **2.1 Peer influence**

Jeanne Jenkins<sup>1</sup>, in a study of 2229 grade eight, ten, and twelve students, found that peer influence remained the variable most associated with drug use across the three grades involved. In an earlier study involving 27,335 grade seven to twelve students, Barnes and Welte<sup>2</sup> found that the age of the respondent and the number of friends who drank were the factors having the strongest associations with adolescent drinking. Some 46% of students with no drinking friends drank compared with 90% of students with drinking friends. Barnes and Welte found the relationship between drinking and having friends who drank to be stronger among younger adolescents compared with older ones. Cohen et al<sup>3</sup> in a two cohort study of grade five and seven students followed over four and three year periods respectively found that friends' substance use was strongly associated with adolescent initiation and continuation of smoking and drinking in all study years.

In a study of 1236 students in grades nine to thirteen, Feldman et al<sup>4</sup> found drinking was most strongly associated with having friends who drank after accounting for all other factors in the study. No heavy drinkers reported that none of their friends drank and only 2% of non-drinkers reported that all their friends drank. Gerrard et al<sup>5</sup> in a study of 500 students, found peer group

drinking was not only associated with adolescent drinking but also lessened the protective effect of negative parental attitudes towards drinking. The process of becoming an adolescent drinker meant rejecting parental influences and beliefs and this process was accelerated by association with drinking peers.

The direction of causality between having risk taking friends and individual risk behaviour is not clear. Recent literature indicates that association with risk taking peers does not lead to risk taking but that the adolescent's own predilection for sensation seeking/risk taking leads him/her to seek out like minded peers.

Several studies have suggested that an adolescent's predilection for risk taking is the result of early adolescent experiences and parenting styles. Patterson Reid & Dishion<sup>6</sup> provided insight into the association between adolescent risk behaviours and earlier parenting practices in their Developmental Model of Adolescent Problem Behaviour in which they stated that pre-adolescent aggression would ultimately lead to multiple risk behaviours in early adolescence. This model explained that high levels of family conflict, including harsh and inconsistent discipline, and low levels of family involvement led to aggressive behaviour in the pre -adolescent through progressively more coercive interactions between parent and child. As the child's aggression grows, parents become more inconsistent in their discipline and monitoring to avoid confrontation and the pre-adolescent's aggressive behaviour becomes even more firmly established. The model went on to explain that as the child aged and his aggression increased, he/she would be shunned by less aggressive peers and begin to associate with similarly rejected

peers. This association with these similar peers would lead to a cluster of problem behaviours including anti-social behaviour, poor academic performance, high risk sex and multiple substance abuse.

Shedler and Block<sup>7</sup> proposed that by the time they reach adolescence, students were actively selecting and forging the circumstances and peers that suited them and that the role of peers was inadequate to explain substance use. They felt that problem substance use was a consequence of overall maladjustment, related to early childhood development and that parenting was the major significant precursor to substance use. Thus choosing to affiliate with substance using peers was really an indication that the child already intended to use substances. In a 1990 study that followed 101 students from five years of age through to eighteen years of age, Shedler and Block found adolescent substance abuse at age eighteen to be associated with the mothers' observed behaviour during tests held when the child was five. During such test situations, the mothers of those youths who would develop problem substance use by the age of eighteen were relatively hostile, insensitive to their children's needs, critical, unsupportive, and overly concerned with their child's performance. The mothers of those students who abstained from or only experimented with substance use at eighteen years of age had made the test situations fun for their five year old children by being warm, spontaneous and encouraging.

The parenting scale developed by Arnold, Wolfe, O'Leary and Acker<sup>8</sup> identified parental disciplinary styles in pre-adolescence that they felt would lead to problem behaviours during adolescence. The study assessed parental discipline of preschool children 18 months to 48

months of age. The resulting parenting scale contained three constructs related to parental discipline: overreactivity which measured a parent's tendency to react impatiently and adversely to their child's problematic behaviour, laxness which described the parent who was inconsistent in his/her demands and discipline for non-compliance, and verbosity which described the parent who preferred lengthy verbal reprimands to direct action. Arnold related both a high overreactivity score and a high laxness score to the subsequent development of oppositional behaviour and conduct disorders.

The findings of Stanton, Lowe and Silva<sup>9</sup> also supported the idea that the adolescent's decision to take risks preceded his or her selection of peers. In a study of children with a history of smoking, Stanton et al found there were no predictors of whether a child who currently smoked would continue to smoke other than having friends who smoked. The study suggested that once children have tried smoking, their choice of friends was a function of their smoking status. When these same adolescents were interviewed again, two years later, those who had previously smoked but did not continue to smoke had no friends who smoked while those who continued to smoke had friends who smoked. Further supporting this view that individuals seek out similarly minded peers, Mitchell and West<sup>10</sup> in 1996 found that adolescents between the age of twelve and fourteen years who did not want to smoke avoided social situations and contexts associated with smoking or chose non-smoking friends and, if necessary, dropped friends who started to smoke. Mitchell and West rejected the idea that peer influence was one way and coercive and that adolescents were socially incompetent and vulnerable.

Michael Unger<sup>11</sup> in a qualitative study of 41 high risk youths also questioned the idea that adolescents would sacrifice all to follow the dictums of their peers. In this group, participants used peer groups to challenge labels given to them by their families and societies, and tested out new roles within those peer groups but did not sacrifice their individuality nor necessarily follow all the norms of the peer group. Instead they appeared to draw from the group those things that assisted their personal growth and individuation. This study further supports the idea that adolescents seek out those peers who are like minded or who provide qualities or an environment that supports personal needs whether or not those needs could be considered injurious.

Brown, Mounts, Lamborn and Steinberg<sup>12</sup> discussed the results of several ethnographic studies in American high schools.<sup>13,14,15,16</sup> Certain groups with core characteristics such as seemingly well adjusted “populars” and a more alienated group of “Greasers”, “Burnouts” or “Losers” appeared in all studies. Sandwiched between these two, were the “normals”. Also common in most cases were an outside group of “Brains” and another category of “Loners” or “Nerds”. Besides identifying these common peer groups, the ethnographic studies indicated that a peer group’s ability to influence an adolescent’s behaviour was actually quite limited. The adolescents did not fall haphazardly into one group or another and then become a victim of that peer group’s norms. Instead, adolescents were invited into a peer group because of the reputation they had established among peers. Once in the group, there would be pressure to conform to the peer group’s norms and friends would be selected from within that peer group but these activities would not change adolescent behaviour so much as reinforce an existing predilection, one that directed the adolescent to the group in the first place.

In their own study, Brown et al<sup>12</sup> examined peer affiliation, risk behaviour and parenting practices by looking at adolescent membership in various informal peer groups defined by the 3781 participating students, fifteen to nineteen years of age. The groups identified included “populars”, “jocks”, “brains”, “normals”, “druggies” and “outcasts”. The study confirmed that peer group norms, both positive and negative, reinforced existing behaviours and predispositions. The study found that peer groups could not offset the impact of earlier (pre adolescent) parenting strategies and that current parenting strategies could effectively steer the adolescent towards membership in specific groups.

## **2. 2 Parental influence**

The role of parenting in the causal mechanism associated with adolescent risk behaviour has two dimensions. The parenting style experienced in early childhood and described by Patterson Reid & Dishion<sup>6</sup>, Shedler and Block<sup>7</sup> and by Arnold et al<sup>8</sup> may explain the association between previous parenting practices and the adolescent’s current risk taking; however if curtailing current adolescent risk taking is the outcome of interest, current parenting practices are more immediately influential. Current parenting practices influence adolescent risk taking through the mechanisms of parental modelling and parenting style.

### **2.2.1 Parental modelling**

Parental modelling refers to the influence that parent’s own tobacco use, alcohol consumption and drug use have on the risk related decisions of the adolescent. Resnick et al<sup>17</sup>, in a study of 12,118 grade seven to twelve students found that parental smoking, drinking and use of other

substances in the home was associated with increased adolescent substance use. They suggested that parental use increased adolescent access to cigarettes, alcohol and other substances. Resnick also found that parental disapproval of sexual activity was associated with delayed sexual debut.

Jackson et al<sup>18</sup> interviewed 488 children in grade five and again in grade seven to see if perceived parental practices at the younger age affected alcohol consumption at the older age. Children who reported drinking at home in their grade five interview were more likely to have consumed alcohol in the 30 days prior to their grade seven interview. Cohen et al<sup>3</sup> also found parental alcohol use to be predictive of adolescent alcohol use. They did not find an association between parental and adolescent smoking.

Parental attitudes about adolescents who participate in risk behaviours such as smoking, drinking and drug use have also been found to influence adolescent behaviour indirectly by influencing the adolescent's cognitions about these risk behaviours. Barnes and Welte<sup>2</sup> found that 59% of students whose parents disapproved of drinking, drank compared with 90% of students whose parents were indifferent.

Gerrard et al<sup>5</sup> used the Prototype Willingness model to explain how parental attitudes about alcohol consumption interact with peer influences to affect adolescent drinking. The model stated that adolescent risk behaviours although voluntary were not premeditated, that risk behaviours had clear prototypes or images associated with them and that the adolescent must like the prototype associated with the behaviour before he or she will adopt the behaviour. In other

words, adolescents were sensitive to the consequences of their behaviour and were aware that they would acquire the image associated with the risk behaviour if they engaged in that behaviour in public. In a study of 500 youth and their families, parental prototypes of adolescents who drank (the image that parents have of drinking adolescents) did affect adolescent drinking by affecting the adolescent's prototype of drinking, however this influence was weakened when the adolescent encountered a peer environment that facilitated drinking.

### **2.2.2 Parenting style**

Parenting style is described as the amount of support given by parents, the amount of interest they take in their child's behaviour, and the authority they exert in the day to day life of their child. Each of these attributes affects the likelihood of adolescent risk taking.

In a 1966 review of previous studies, D. Baumrind<sup>19</sup> described and contrasted three models of parenting style: Authoritative, Authoritarian and Permissive and identified the authoritative as the most favourable. Macoby and Martin<sup>20</sup> expanded upon these models, describing four styles of two dimensional parenting. The two dimensions of parenting used were responsiveness and demandingness. Responsiveness was defined as parental involvement in the child's well being by being affectionate and accepting, providing comfort and support, being involved in social/academic development and recognizing and rewarding achievement. Demandingness described parental assertion of control over their children's lives by establishing rules for behaviour, enforcing rules, monitoring activities, and maintaining structure and regimen in child's life. The four parenting styles resulting from different combinations of these dimensions

included: Authoritative (high demandingness and high responsiveness), Authoritarian (high demandingness and low responsiveness), Indulgent or Permissive (low demandingness and high responsiveness) and Indifferent or Neglectful (low demandingness and low responsiveness).

Subsequent studies indicated that authoritative parenting produced a more independent, well rounded, socially capable child with fewer deviant behaviours including health risk behaviours. Baumrind went on to do a comprehensive longitudinal study on the effects of parenting style on the development of children from three years of age through to fifteen years of age.<sup>21 22 23 24 25 26</sup> At the final stage of this study she had identified seven parenting types: Authoritative, Democratic (unconventional but modestly firm parenting), Non-directive (supportive and unconventional, similar to permissive), Directive (controlling, firm, rejecting and traditional parenting) composed of two subtypes: Authoritarian Directive (highly intrusive parents ) and Non-authoritarian Directive (less intrusive parents); Unengaged (similar to neglectful) and Good Enough (parents adequate in all areas). The increased number of categories allowed more detailed examination of parenting practices and made the superiority of Authoritative parenting more ambiguous; however the combination of high responsiveness and high demandingness continued to represent the most protective style of parenting.

While both responsiveness and demandingness define parenting style, composite measures of parenting provided little information regarding which dimension (demandingness or responsiveness) was responsible for study outcomes. In their 1991 study, Lamborn et al<sup>27</sup> tested four areas of development (psycho-social development, internalized distress, school achievement

and problem behaviour) among adolescents subjected to the four parenting models (Authoritarian, Authoritative, Permissive and Neglectful). Prior to this, studies tended to examine the impact of the various parenting styles on only one outcome such as psycho-social development and might denigrate a particular parenting style for its adverse effect on this one outcome without assessing the protective effect it could have on other outcomes such as problem behaviours.

Authoritatively raised adolescents (parents exhibited high demandingness and high responsiveness) fared the best across all four outcomes (better psycho-social development, less internalized stress, higher levels of academic achievement and lower incidence of problem behaviour) and those from neglectful homes (parents exhibited low responsiveness and low demandingness) fared the worst.

Adolescents reared in homes with high parental demandingness (both authoritative and authoritarian) reported reduced deviant behaviour and higher academic accomplishment) compared with those reared in homes with low parental demandingness (both permissive and neglectful). Adolescents reared in homes with high responsiveness (authoritative and permissive) reported higher social competence, self reliance and less internalized stress than those reared in homes with low responsiveness (authoritarian and neglectful). Overall demandingness reduced deviant behaviour whether or not accompanied by responsiveness.

Jackson et al<sup>18</sup> also treated the impact of parental responsiveness and demandingness separately in their examination of the effect of parenting styles over time. Students were interviewed in grade five and again in grade seven about their alcohol use, the alcohol use of their parents and about the demandingness and responsiveness of their parents using the Authoritative Parenting Index of Jackson, Henriksen and Foshee.<sup>28</sup> They too found parental demandingness and not responsiveness to be associated with reduced risk taking. The stronger the child's perception of parental discipline and supervision was in grade five, the less likely they were to report drinking at their second interview in grade seven.

#### **2.2.2.1 Parental demandingness**

Research has further broken down parental demandingness into several closely connected activities: the monitoring of adolescent activities, the establishment and enforcement of rules for behaviour, and the maintenance of structure and regimen in child's life.

#### **Monitoring**

In Cohen's<sup>3</sup> study of two cohorts (1034 fifth graders and 1266 seventh graders) followed over four and three year periods respectively, parental monitoring and positive parent child relationship were strongly protective against adolescent initiation and continuation of smoking and drinking. Monitoring, characterized by parents knowing where children were outside of school and setting curfews, directly reduced problem behaviour. Monitoring allowed the parent to recognize inappropriate behaviour and perhaps correct it. Monitoring was not directly associated with the befriending of substance using peers.

Steinberg et al<sup>29</sup> in a two year study of 6500 adolescents conducted during the 1987 and 1988 school years examined the impact of peer affiliation versus parental monitoring on adolescent drug use. Parental monitoring was effective in both preventing the initiation of drug use and in stopping or decreasing drug use among current users. Monitoring encouraged males who were heavily involved in drugs to decrease their usage and encouraged girls who were experimenting to stop. Monitoring did not offset the influence of risk taking peers but because heavily monitored non-drug using adolescents were less likely to use drugs, they were less likely to be in a situation where drug using peers could influence them.

Brown et al<sup>12</sup> examined the manner in which parents can affect peer group affiliation through monitoring, expectation of scholastic achievement and involvement of youth in decision making by relating these three parenting measures to the child's association with six peer groups ("populars", "jocks", "normals", "brains", "druggies" and "outcasts"). The study found that parental influences on peer affiliation were largely indirect, through their impact on behaviours by which teenagers become associated with a particular crowd. Furthermore, parents had the capacity to direct their child towards an essentially pro social crowd (such as the "brains") or an antisocial crowd (such as the "druggies") or a peer group with mixed characteristics such as "populars" or "outcasts". Monitoring was found to be the parenting trait capable of steering the adolescents to various groups.

In a study in which 298 parents of middle school students were interviewed about their parenting practices, Irvine et al<sup>30</sup> also found that a lack of parental monitoring was associated with child behaviour problems and was indicative of poor rapport in the family.

Li et al<sup>31</sup> used Silverberg's six item measure of perceived parental monitoring<sup>32</sup> and an 11 item measure of self-reported risk behaviours to assess the impact of parental monitoring on drug use, drug trafficking and unprotected sex among 383 Afro American youth, nine to fifteen years of age, over a four year period with participants interviewed at years one, two and four. The results showed that parental monitoring both delayed the onset of risk behaviours and reduced their occurrence among those who already practice them. The four year study also indicated parental monitoring was effective at various age levels.

Baker et al<sup>33</sup> examined the relationship between perceived parental monitoring and sexual experience, contraception and substance use by asking 174 teenaged girls to rate the extent to which they were directly and indirectly monitored by their parents and comparing these perceptions with contraception and substance use outcomes. Direct parental monitoring was defined in two dimensions: 1) direct monitoring by parents and 2) direct monitoring by parents when with peers. Direct parental monitoring was associated with contraceptive use. Direct parental monitoring when with peers was associated with less use of alcohol and cigarettes.

## **Monitoring as a measure of knowledge**

In 2000, Stattin and Kerr<sup>34</sup> challenged the meaning applied to parental monitoring thus far.

Stanton and Kerr indicated that what previous research had considered “parental monitoring” in fact represented “parental knowledge” and that a truer definition of monitoring was needed. They stated that although the term “monitoring” implied the measurement of parents’ tracking and surveillance efforts, it actually referred to an end product: “parental knowledge”, providing little information about the parental mechanism used to gain this knowledge.

Stattin and Kerr went on to state that there were three ways by which such parental knowledge could be obtained: child disclosure (child talks willingly about activities); parental solicitation (parent asks child and child’s friends for information about child’s activities when away from home) and parental control (parent imposes rules and restrictions on their child’s activities and associations reducing the freedom their child has to do things without telling them). By making this distinction, Stanton and Kerr wanted to differentiate between the protectiveness of parent initiated activities (parental solicitation and control) and the protectiveness arising from parental knowledge (which may result from adolescent voluntary disclosure rather than parental effort).

In terms of predicting risk behaviour, Stattin and Kerr found child disclosure to be negatively associated with norm breaking (drug use, drinking, stealing). Higher solicitation efforts among parents were associated with higher norm breaking among youth. Stattin and Kerr also suggested that parents and children perceive parental control differently. When a child reported high levels of parental control (imposing rules to restrict child activities), parental control was found to be

linked with lower levels of child norm breaking but when parents reported high levels of control, the protective association between this control and norm breaking was not found.

Stattin and Kerr also stated that although current monitoring scales tapped into parental awareness of their children's whereabouts, such scales did not represent parents' behavioural attempts to control their child and did not distinguish between parental solicitation mechanisms and child disclosure. Stattin and Kerr defined a good parent-child relationship as a two way process that included both parental solicitation of knowledge and control of their child's behaviour and the child's willingness to make their parents part of their lives. "Parents who are good monitors have made the effort to establish channels of communication with their child and as a result of their relationship with the child, they are knowledgeable about the child's daily experiences."<sup>35</sup>

### **Parental control**

Parental control occurs when parents attempt to remain knowledgeable about their children's lives by imposing rules and restrictions on their child's activities and associations reducing the freedom their child has to do things without telling them. According to Stattin and Kerr, the establishment of rules along with the consequences for breaking them represent a truer measurement of monitoring as a parental activity rather than an outcome.

## **Rule setting**

Rule setting forms the basis for parental control; however, the methods by which parents conceptualize and enforce rules and authority in the family are implicit in the definition of parenting styles. The degree to which the adolescent is involved in establishing the rules of behaviour differentiates the authoritative parenting style from the authoritarian parenting style. Control imposed without adolescent involvement (in a non-responsive environment) may be a less successful monitoring device.

In a study involving 110 grade six, eight and ten students, Smetana<sup>36</sup> contrasted adolescent and parental views of a parent's right to set rules in eight conceptual domains, based on a domain specificity model of social cognitive development by Turiel<sup>37</sup> which suggested that adolescent and parental views of parental authority often vary according to the conceptual domain of the issue under consideration. The domains included: *Moral* - acts that are wrong because they interfere with the rights of others, *Conventional* - arbitrary acts that govern social interaction in different social systems, *Personal* - acts that have consequences only for the actor, *Prudential* - acts which pertain to safety, comfort and health, *Multifaceted* - acts that contain elements of the conventional and personal domains, and *Friendship* - acts that contains conventional, personal and psychological elements. The domains considered personal or containing personal components were expected to be the most contentious in terms of rule setting.

The permissive parent allowed the adolescent a broader jurisdiction of freedom and when assessing complex situations that contained both personal and conventional components, tended

to overlook the conventional component leaving the decision to the adolescent. Authoritarian and authoritative parents also differed as expected. Authoritarian parents were less likely to maintain a clear boundary between moral, conventional and personal issues when establishing rules and often viewed conventional and personal issues as moral ones. The reasons for their rule making were not consistent nor well explained.

Authoritative parents allowed more input from the adolescent. They did not necessarily grant more freedom within the personal domain compared with authoritarian parents but were more focussed and consistent in their rule setting and explanations concerning the rules. The study proposed that this ability of authoritative parents to articulate the societal and welfare concerns raised by complex issues within the multifaceted and personal domains facilitated the adolescent's understanding of the limits or boundaries of their personal jurisdiction and was as important as the establishment of the rules themselves.

## **Discipline**

Irvine et al<sup>30</sup> undertook an assessment of parental disciplinary practices in a study in which parents were interviewed. Irvine used a refined version of the parenting scale first developed by Arnold, Wolfe, O'Leary and Acker in 1993.<sup>8</sup> Of the three factors identified in Arnold's original parenting scale, Irvine and colleagues used laxness and overreactivity to create the Parenting Scale - Adolescent version. Irvine found that both high overreactivity and high laxness contributed to child problem behaviours. Both parents exhibiting high overreactivity (parent reacted impatiently and adversely to their child's problematic behaviour) and those exhibiting

high laxness (parent was inconsistent in his/her demands and discipline for non-compliance) tended to report fewer family activities and increased negative parent child interactions. The ineffectiveness of both high overreactivity and high laxness as preventive measures against problem behaviour indicates that discipline does play a protective role in reducing risk behaviour but only if disciplinary practices are consistently and appropriately administered.

#### **2.2.2.2 Parental responsiveness**

The identification of demandingness as the attribute of parenting style that is most protective against adolescent risk taking does not mean that parental responsiveness offers no protection against adolescent risk taking. If demandingness could be said to offer “immediate” protection against the initiation of risk taking and can curb existing risk behaviours, then responsiveness provides the “future” immunity to risk taking. It is responsiveness that differentiates the rule setting practices of Smetana’s<sup>37</sup> authoritarian and authoritative parents. It is the highly responsive authoritative parent who explains the rationale behind the rule which will produce a more well adjusted, socially competent and emotionally healthy adolescent.

Lamborn’s<sup>27</sup> 1991 study, described earlier, suggested that in a home with high parental demandingness without correspondingly high parental responsiveness adolescents were overpowered into obedience at the expense of personal well being. In this study, responsiveness was associated with higher levels of social competence and confidence, less internalized stress and higher self esteem all of which impact adolescent decisions about risk taking. There was also some indication from this study that the deviant behaviour of adolescents from homes exhibiting

a permissive parenting style (high responsiveness - low demandingness) is experimental in nature, with experimentation offset in the long term by well developed social skills and self confidence.

A study by Simantov et al<sup>38</sup> based on the Commonwealth Fund Survey of the Health of Adolescent Girls and Boys further supports the protective role of parental responsiveness. A total of 6728 students completed anonymous class room administered surveys. Those adolescents with parental support had significantly lower prevalence of regular smoking and drinking compared with those without parental support; with support being comprised of emotional support, closeness and communication.

Stattin and Kerr<sup>34</sup> also allude to the importance of parental responsiveness by noting that parental non-responsive behaviours such as negativism, hostility, aggression and cruelty would all discourage child disclosure which, as mentioned earlier, they felt was instrumental to parents' gaining accurate knowledge of their child's activities.

### **2.3 Family structure**

Adolescents from single parent families or reconstituted families report more smoking, alcohol use and drug use and often have more risk taking friends. Jenkins and Zunguze<sup>39</sup> studied family structure in relation to gateway substance use and affiliation with drug using peers as well as peer perception about drug use among students in grades eight, ten and twelve. Intact families, mother with step father, single mother and single father families were studied. Fewer adolescents from

intact families smoked. The association between being in a non-intact family and substance use was stronger in younger adolescents (grade 8). In all comparisons in this age group, adolescents from single parent homes and reconstituted homes reported having more drug using friends and perceived less peer disapproval of their drug use. Jenkins and Zunguze proposed that drug using peer groups might be more inviting to those adolescents dealing with the family stresses associated with single parent and step parent homes. This study did not examine other psychosocial factors affecting drug use that may result from divorce nor does it look at parental demandingness which may decrease with divorce. The break up of the biological family may contribute to the overall pre-adolescent maladjustment theorized by Patterson, Reid and Dishion's Developmental Model of Adolescent Problem Behaviour<sup>6</sup> and by Shedler and Block.<sup>7</sup>

Brown et al<sup>12</sup> in their 1993 study of peer affiliation, risk behaviour and parenting practices, described earlier, found that adolescents from intact families were over represented in those groups believed to be high performance, pro-social and overall well adjusted ( groups labelled "brains" and "popular" by peers) and under represented in those groups believed to be underachieving, anti-social and somewhat maladjusted (groups labelled "druggies" and "loners" by peers). Conversely, adolescents from step families were over represented in the "druggies" group and under represented in "brains" and "jocks". The study suggested that anger toward step parent spilled over into school and peer relationships. Peer groups where association with school adults was required (such as in the "brains" and "jocks" ) were avoided by those from single parent/ step parent families in favour of groups where contact with school adults was less likely.

Steinberg et al<sup>40</sup> in a 1987 study, asked 865 children from Wisconsin in grades five through nine about their home life, peer pressure and decision making practices within the family unit. They found that living with two parents was more protective than other family structures against adolescent risk taking and association with deviant peers. However this was only true of adolescents living with two biological parents. Adolescents living in homes with stepparents were equally at risk as those from single parent homes. This study hypothesized that family structure changed adolescent risk taking thus affecting their susceptibility to deviant peers; however causal direction was not confirmed between risk behaviour and susceptibility to peers. Family structure could as easily affect peer susceptibility which then affected risk taking.

Jessor's<sup>41</sup> Problem Behaviour Theory offers one explanation for the relationship between adolescent risk taking and family structure by proposing that family problems may create an environment that is not positively grounded in traditional social institutions which can lead to deviant behaviours. The breakdown of the original family unit weakens one of the conventional bonds (to society, families, schools and religion) that compel individuals to adhere to conventional standards of behaviour.

## **2.4 Emotional well being of the respondent**

Adolescents who identify themselves as being loved, self confident, comfortable with their abilities and with few stressful events in their lives are at less risk of substance abuse than are those facing personal or family distress or who lack confidence in themselves or have limited coping skills. Galambos et al<sup>42</sup> in a study of 2060 respondents from the 1994/95 National

Population Health Survey found personal stress to be significantly linked to multiple risk behaviours in respondents aged 15 to 19. Psychological factors associated with adolescent drug use included lower self esteem, greater external locus of control, high degree of dissatisfaction and pessimism. Stressful family situations<sup>36</sup> and inappropriate parenting styles<sup>18</sup> both negatively impact the emotional well being of the adolescent and increase likelihood of drug use. Unwanted (forced) sexual activity also affects emotional well being. Forced sexual activity was associated with low self esteem, depression, substance abuse and unsafe sexual practices.<sup>36</sup>

## **2.5 Participation in group activities**

Another factor associated with adolescent risk behaviour was social activity or membership in organized groups. Increased involvement in enjoyable extracurricular activities was associated with decreased drug use, although not offsetting the association between peer drug use and adolescent drug use.<sup>1</sup> Simantov et al<sup>38</sup> studying 6728 adolescent males and females found extracurricular activities to protect against smoking but not drinking and hypothesized this may be because many extracurricular activities involve sports which smoking directly impacts.

Cohen et al<sup>43</sup> conducted a cross sectional survey (n=2134) in six schools within an urban school district. Sexual activity, substance use, and the prevalence of gonorrhoea or chlamydia were measured. Some 56% of respondents reported being home without an adult present four or more hours per day after school. Among girls but not among boys, sexual activity was associated with non-participation in after-school programs; 71% of those who were not participating in an after-school activity were sexually active compared with 59% of those who were participating. Cohen

suggested that given the independent association between the amount of unsupervised time and sexual and substance use behaviours, youth supervision should be increased, if not by parents, then by programs organized at schools or in other community settings.

## **2.6 Exposure to forced (pressured) sex / sexual violence**

Besides adversely affecting the emotional well being of both male and females adolescents<sup>38</sup>, unwanted sexual activity is associated with substance use and recent unsafe sexual activity.

Shrier et al<sup>44</sup> found in a 1998 study of 7884 sexually active male and female adolescents that 30% of girls and 10% of boys reported forced sex. In females, resulting behaviours tended to be externalized (such as fighting). In males, resulting behaviours tended to be internalized (bulimia). Increased sexual activity and sex without a condom were reported by both sexes.

Also exploring whether a history of sexual abuse was associated with high-risk sexual behaviours and examining the role of depression and substance abuse in explaining this association, Buzi et al<sup>45</sup> interviewed 184 sexually active females attending alternative schools in a large urban city in the southwestern United States. Some 26% reported having been forced to have sex. Adolescents reporting a history of sexual abuse, compared to those who did not report such a history, were significantly more likely to have initiated sexual activity (intercourse) before age 14, to have had three or more sexual partners in the last 3 months, and to have had a history of sexually transmitted diseases; associations which remained significant after controlling for age, ethnicity, and family income. Depression and substance abuse did not explain the association between sexual abuse and high-risk sexual behaviours.

Exposure to a violent partner/boy or girlfriend is also associated with risk taking. Using data collected from 21,297 Vermont adolescents in a 1995 Youth Risk Behaviour Survey, Kreiter et al<sup>46</sup> examined gender specific risk patterns associated with date fighting. The risk behaviours examined included suicide attempts, substance use, sexual behaviour, and pregnancy. The patterns of risk behaviours differed among male and female adolescents reporting dating violence. Females who reported date fighting were more likely compared with were non-fighters to have attempted suicide, to engage in sexual and other HIV risk behaviours, to have been pregnant, experienced forced sex, and to have ridden in a car with a drinking driver. Sexual behaviours, including same-gender sexual partners, forced sex, and having been threatened with physical violence, were associated with date fighting among males.

## **2.7 Gender and risk taking**

Some literature suggests that risk taking varies between boys and girls. Both the 1999 Youth Risk Survey administered to 964 females and 852 males in the Midwestern United States and an earlier one conducted in 1997 found that significantly more adolescent girls than boys reported engaging in several high risk sexual and drug behaviours. Girls reported having their first drink of alcohol at an earlier age, driving a vehicle in the past 30 days when they had been drinking, smoking at an earlier age, smoking more cigarettes per day, and using over-the-counter drugs to get high more often than boys.<sup>47</sup>

Sarigiani et al<sup>48</sup> used data from a 1997 Commonwealth Survey of Adolescent Health to examine the impact of health risk behaviours on adolescent women's current and future health and

development. This study found that adolescent women were no more likely to smoke, drink, and engage in other substance use as their male counterparts, but suffered increased health risks when they did and had different motivations. Adolescent females in this study were more likely than males to experience physical abuse, and they were twice as likely to be sexually abused.

Sexual preference has also been found to be associated with risky behaviour among adolescents. Using 1995 and 1997 data from the Vermont and Massachusetts Youth Risk behaviour Surveys, Robin et al<sup>49</sup> examined associations between health risk behaviours and sexual experience among opposite-, same-, or both-sex partners. The combined samples included 14,623 students from Vermont and 8,141 from Massachusetts. Outcome measures included exposure to violence, harassment, suicidal behaviour, alcohol and other drug use, and unhealthy weight control practices. Both-sex students were more likely to be threatened or injured with a weapon at school, to make a suicide attempt requiring medical attention, use cocaine, or vomit/use laxatives to control their weight than either same-sex or opposite sex students; indicating that both-sex students may be at more risk of injury, disease, and death by experiencing serious harassment and engaging in violence, suicidal behaviour, alcohol and other drug use, and unhealthy weight control practices than students with either opposite or same sex orientation.

## **2.8 Summary**

In summary, youth risk taking has complex causes with many interactive components. These components or events need not arise during adolescence when the risk taking behaviour is manifested but may have occurred years earlier. Existing literature suggests that some

combination of current factors relating to peer activity, parenting style and emotional well being, perhaps coupled with earlier childhood experiences, influences adolescent risk taking; however, it remains difficult to identify exactly what factors and in what combination will impact a youth's decisions to partake in potentially injurious behaviour.

An article by Rashad and Kaestner<sup>50</sup> appearing in the Journal of Health Economics in 2004 further highlights the complexity of risk behaviour causality and the continued inadequacy of current causality measurement systems. The article noted that an adolescent's sexual behaviour and substance use depend on a set of personal and social behaviours, many of which are not accurately measured and suggested that researchers continue to devise credible empirical strategies to overcome this omitted variable bias.

### **3. Methods**

#### **3.1 Comparison of regional goals and objectives**

##### **Eastern Newfoundland**

The overall goal of this LoPHID cycle was to help young people make healthy choices through the development of effective decision making skills. The specific objectives were as follows:<sup>51</sup>

- Establish a baseline on perceptions of risk and safe practices for youth focussing on alcohol, tobacco, drugs, unwanted sexual activity, unprotected sex and vandalism.
- Develop an action oriented understanding of the determinants of risk behaviours, protective practices and decision making processes among young people.
- Obtain direction from young people and their supporters in developing strategies to promote effective decision making.
- Disseminate information on risks and resilience produced by the project to young people and their supporters and encourage its use for creative program development.
- Ensure the use of project information by Health and Community Services, Eastern Region, to design and implement innovative programs to address youth risk behaviours.
- Monitor progress toward the aim of reinforcing healthy choices among young people, bench marking indicators on social impact related to changing perceptions and practices and participation of young people in protective activities.

##### **Labrador**

The goal of the third LoPHID cycle in Labrador was to promote healthy decision making by adolescents and to increase the effectiveness and efficiency of community health services and

supports to both adolescents and parents. The cycle had four objectives:<sup>52</sup>

- To assess the prevalence and patterns of smoking, drinking, vandalism, violence and drug/solvent abuse among adolescents in the catchment area as well as the occurrence of and circumstances surrounding adolescent sexual activity
- To identify those factors that contribute to adolescent risk taking and those that promote risk avoidance, including the influence of peers and parenting techniques
- To identify gaps in services and supports for Labrador adolescents and their families
- To use the evidence from this cycle to advocate for more effective services and community supports for adolescents at risk and their families.

The goals and objectives of the two cycles while similar did vary in focus. In Eastern Newfoundland, the emphasis was on establishing a dialogue with youth about risk behaviours, seeking adolescent input about the best venues through which to promote healthy behaviours. Labrador region focussed on the protective role of parenting in preventing adolescent risk behaviour, identifying parenting skill gaps associated with adolescent risk behaviours and possible interventions.

### **3.2 Comparison of survey samples**

#### **Eastern Newfoundland**

Statistics Canada provided a random sample of twenty enumeration areas in proportion to rural and urban areas within the Eastern Newfoundland Health and Community Services region.

Schools within these enumeration areas provided the student population to be surveyed.

## **Labrador**

In Labrador, given the smaller population and isolated communities, the research team was able to survey all schools in all participating communities within the region covered by Health Labrador Corporation. Survey sites included Labrador City, Happy Valley - Goose Bay, Northwest River, Sheshatshiu, Davis Inlet, Cartwright and Black Tickle. The majority of the students interviewed resided in the urban areas of Happy Valley - Goose Bay or Labrador City. The community of Churchill Falls and those communities covered under the Labrador Inuit Health Commission declined to participate. The Labrador Inuit Health Commission later undertook a similar survey.

### **3.3 Comparison of the survey instruments**

During the development stage, field teams in both health regions pretested the instruments in classrooms outside the selected survey sites. Through discussions with participants involved in the pretest, researchers identified questions that were not clear and made appropriate modifications. The two survey instruments reflect the different focus in each region. (Copies of both questionnaires included in annexes A1 and A2)

## **Eastern Newfoundland**

This questionnaire asked students about their experiences with alcohol, tobacco, other drugs, unwanted sexual activity, unprotected sex and vandalism, and about various individual and social, family, and community factors that may play a role in risk and resiliency. Researchers in this region also asked students to indicate the reasons why they first engaged in and/or why they

did not engage in various risk behaviours. The Eastern Newfoundland researchers also asked participants to suggest what would be a good reason for someone to stop engaging in risk behaviours. Internet access and experience were also explored to determine the viability of communicating with young people through the Internet.<sup>51</sup>

## **Labrador**

In the Labrador questionnaire, adolescents were also asked about their experiences with alcohol, tobacco and other drugs, gas sniffing, unwanted sexual activity, unprotected sex, vandalism, and violence. The Labrador research team also asked youth about various individual, social, family, and community factors that might play a role in risk and resiliency, and the reasons why they did or did not engage in various risk behaviour<sup>52</sup>.

In a second section of the questionnaire, the Labrador research team attempted to measure the emotional well being of the participants by asking a series of questions about the level of distress they feel<sup>53</sup>, their feeling of self esteem<sup>54</sup>, the amount of support they feel they have<sup>55</sup> and the level of mastery or extent to which they believe they are in control of their lives<sup>56 57</sup>.

### **3.4 Ethical considerations**

Research teams in both areas submitted their project proposals to their appropriate ethics committee addressing, in particular, issues of consent, voluntary participation, confidentiality and the post survey protection of participants.

### **3.4.1. Consent**

Both research teams informed parents about the project by a letter sent home with students. The letter described what their child would be asked to do (fill out a questionnaire). If parents did not want their child to participate, they signed and returned the letter and the child did not participate in the classroom survey. The research teams assumed permission to participate to be granted if no signed letter was returned. Active consent, were it used, might have introduced a bias into the survey sample by including only those students from homes where parents were interested and involved in the day to day life of their children (as demonstrated by their reading and returning mail from school) and excluding those students from homes where parents either ignored such notices or were not made aware of them<sup>58</sup>.

### **3.4.2 Voluntary participation**

When the surveys were conducted, field teams instructed students that their participation was voluntary, that any question which proved uncomfortable could be skipped and that they could stop at any time.

### **3.4.3 Confidentiality**

Research field teams conducting the surveys informed students that their responses would be confidential and participants returned their questionnaires in envelopes provided for that purpose. No names or identifying information appeared on the questionnaires. In both regions, researchers gave each completed questionnaire a unique number that identified only the school and classroom

of the participant. This study is based only on the anonymous data sets produced in each region study and does not breach the confidentiality established in each region.

#### **3.4.4 Protecting the respondent**

Research teams made the school principal or designate fully aware of the survey contents prior to the date of the survey. Based on input from school/health officials and counsellors, the research teams gave respondents handouts on the day of the survey containing contact information for local counselling and crisis centres and/or hot lines should any of the survey questions raise troubling issues.

#### **3.5 Data collection**

In both regions, the survey instruments were self-administered in classrooms during school hours. The survey administrators supervising the completion of the questionnaires were either employed directly by the respective health region or were hired from the respective communities for this purpose. Teachers were present in the classroom at the time of the survey but did not answer questions regarding the content of the survey and remained at their desks to protect the confidentiality of student responses. Both regions limited the survey population to those students attending school on the day of the survey.

There was one important difference in data collection methods. In Labrador, in the Innu community of Sheshatshiu, school attendance was well below the regional average and local public health staff and community members were concerned that the majority of youth would not

be reached if the surveys were administered only in the classrooms. Consequently, public health employees and/or designated community members contacted the majority of Sheshatshiu youth outside of school. The questionnaires were self-administered except when illiteracy prevented youth from completing them unassisted. Focus groups (one per participating school) to discuss selected key findings were subsequently held in each region. It was not possible to combine the data from these focus groups given their different content; however the comments of the respondents provided valuable information about the appropriateness of potential interventions.

### **3.6 Data entry**

The research teams in both areas designed their questionnaire in a scannable format. The completed questionnaires were scanned into a computer data base using the Remark software package. In Labrador where respondents were often given the opportunity to write in responses, the research team used Epi-Info for additional data entry. After the scanned data bases were imported into Epi Info, the research team checked the data for logical errors.

### **3.7 The combined data set**

To create a combined data set, I examined the two regional questionnaires to establish the compatibility of the resulting data. Given the different objectives of the two regions, many questions were exclusive to each region and many questions from the original survey in Eastern Newfoundland were modified when included in the Labrador survey. When I examined these modified survey questions, not all data provided were comparable. I found two main types of modification that limited comparison of the two data sets.

In many cases, it was the inclusion of a time frame in an otherwise identical question that made comparison of the results difficult. For example, in Eastern Newfoundland a question about property damage asked “Have you ever intentionally damaged anyone’s property?” In Labrador, the research team modified this to “In the last six months have you intentionally damaged or destroyed anyone’s property?” Respondents in Eastern Newfoundland might have included an incident from long ago, inflating the incidence of property damage in that region compared with Labrador.

The other type of modification limiting regional comparisons involved those questions where respondent were asked the main reason why they did certain things, such as smoking, drinking or using drugs. In Eastern Newfoundland, the research team focussed on identifying primary interventions by asking respondents “Which reason comes closest to why you started to drink?” In Labrador, the research team focussed on secondary interventions by asking respondents “Which reason comes closest to why you drink alcohol?” Consequently the responses to these questions were not compared between regions.

### **3.8 Risk behaviours**

#### **3.8.1 Smoking**

Research teams in both areas asked respondents how many cigarettes they smoked per day with response categories ranging from “I don’t smoke” to “more than 20 cigarettes per day.” The Labrador questionnaire distinguished between those who had never smoked and those who had quit but otherwise the responses were comparable. For analysis in this thesis, I defined smoking

in three ways: 1) those who smoked any (even if not every day) compared with those who did not smoke at all; 2) those who smoked at least one cigarette every day compared with those who were non-smokers or smoked only occasionally (not every day) and 3) those who smoked more than 10 cigarettes a day compared with lighter smokers and non-smokers.

### **3.8.2 Drinking**

Both research teams asked adolescents two questions about drinking. To identify respondents who drank any alcohol, respondents in both regions were asked “Do you drink alcohol?” with responses “yes” or “no” allowed.

To identify regular drinkers, both regions asked respondents how many times in the last six months they drank alcohol with responses ranging from “not at all” to “four or more times a week”.

For analysis in this combined study, I defined regular drinking as “drinking alcohol once a month or more in the last six months” compared with drinking alcohol “less than once a month in the last six months”.

### **3.8.3 Drinking and driving**

Both regions asked about driving a vehicle after drinking with responses ranging from “often” to “never.” The Eastern Newfoundland questionnaire asked “Do you drink and drive a vehicle?” while the Labrador questionnaire asked “In the last year have you driven a vehicle after drinking alcohol?” The main difference between these questions was the time frame included in the

Labrador version. However as the Eastern Newfoundland question asked “do you” as opposed to “have you ever” or “have you” without a time frame, both questions were measuring current risk taking behaviour. For our analysis, drinking and driving is defined as “ever having driven a vehicle after drinking” compared with “never having driven a vehicle after drinking”.

### **3.8.4 Drug use**

The two regions used quite different questions to ask about drug use. In Eastern Newfoundland, respondents answered “yes” or “no” to one question asking if they had ever used any of a number of listed drugs. In Labrador, the respondent was asked about different types of drugs with a “yes” or “no” response allowed for each drug type: 1) so-called soft or gateway drugs, 2) hard drugs and 3) over the counter or non-prescribed prescription drugs including steroids, with examples provided for each category of drug. The different structure of the question about drug use in the two regional surveys meant that in the combined data set, it was only possible to consider the use of “any” drug. It was not possible to examine the type of drug used. Consequently, for this analysis, “any” drug use was defined simply by a “yes” or “no” response to one question in Eastern Newfoundland. In Labrador “any” drug use was defined as a “yes” response to at least one of the three questions about drug use (gateway, hard and non-prescribed/steroid use).

To identify regular/recent drug use, each region asked respondents how many times in the last six months they had used drugs. In Eastern Newfoundland, responses to this question ranged from “never” to “many times.” In Labrador the responses ranged from “not at all” to “four or more times a week.” Given the incompatibility of the response categories on the two surveys, our

definition of regular/recent drug use in the combined data set was limited to “any use in the last six months” compared with “no use in the last six months.”

### **3.8.5 Unsafe sex**

Two items were used to measure unsafe sexual practices among survey participants. Both regions asked respondents how many sex partners they had in the last six months (with response categories ranging from “none” to “four or more”). The regions also asked respondents how often in the last six months they had used a condom when they had sex (with response categories ranging from “never” to “always”). Using these two variables, I defined unsafe sex as “having had at least one sex partner in the last six months” and “not always using a condom” compared with “not having been sexually active in the last six months **or** always using a condom”.

## **3.9 Negative influences on risk behaviour**

The regions asked about two exposures expected to facilitate or increase adolescent risk taking: association with risk taking peers and having experienced unwanted sexual activity. These exposures were defined as follows:

### **3.9.1 Peer pressure/peer risk taking**

To examine the association between peer risk taking and adolescent drinking and drug use, both regions asked respondents how many of their friends drank and how many of their friends used drugs with response categories to both questions ranging from “none” to “all”. For this analysis, I defined the adolescents most at risk of influence from peer drinking behaviour as those reporting

“half or more of their friends drank” compared with those who reported “a few or none of their friends drank.” I defined the adolescents most at risk of influence from peer drug using behaviour as those reporting “half or more of their friends used drugs” compared with those who reported “a few or none of their friends used drugs”.

### **3.9.2. Unwanted sexual activity**

The research team in Eastern Newfoundland asked respondents if either 1) anyone their own age or 2) anyone older than they had ever involved them in unwanted sexual activity. The responses to these questions were limited to “yes” or “no.” The Labrador research team asked respondents if either 1) anyone within five years of their age or 2) anyone older (by five or more years) had ever involved them in unwanted sexual activity. Specifying an age criterion in the Labrador questions made the data from the two surveys compatible only if the two questions were combined into one more general one that ignored the age of the aggressor. I defined those most at risk of being involved in other risk behaviours as those who had experienced any unwanted sexual activity (irrespective of the age of the person responsible) compared with those who reported no unwanted sexual activity.

### **3.10 Positive (preventive) influences on risk behaviour**

Research teams in both areas asked respondents about several exposures expected to decrease or protect against adolescent risk taking: family intactness, parental knowledge, rule setting and discipline and membership in groups. In this thesis, I defined these protective exposures as follows:

### **3.10.1 Family intactness**

Both regions asked respondents with whom/what adults they lived. The Labrador research team modified the response choices to this question to more widely reflect the possible parental/other adult combinations of modern families and did not ask about respondents' siblings; however since it was the parent's influence on risk behaviours being examined, the exclusion of information about siblings in Labrador did not prevent regional comparisons. I defined an intact family as one in which the adolescent resided with both biological parents compared with all other familial permutations such as single parent, parent and step parent, or other relatives.

### **3.10.2 Parental knowledge**

Both regions assessed parental knowledge of adolescent activities/whereabouts with one question. The Eastern Newfoundland research team asked respondents if their parents knew where they were when not at home. The Labrador research team asked respondents if their parents knew who they were with when not at home. To examine the protectiveness of parental knowledge, I compared the impact of "high parental knowledge" (parents usually or always know their child's whereabouts) on risk behaviours with that of "low parental knowledge" (parents seldom or never know their child's whereabouts).

### **3.10.3 Parental control**

#### **Rule setting**

Researchers in both health regions asked adolescents, "Do your parents set clear rules for you to follow?" To determine the protectiveness of parental rule setting, I compared the impact of

“consistent rule setting” (parents usually or always set rules for their child to follow) on risk behaviours with that of “inconsistent rule setting” (parents seldom or never sets rules for their child to follow).

### **Discipline**

Researchers in Eastern Newfoundland asked adolescents, “Are you punished when you do not follow the rules?” while in Labrador, they were asked “Are you disciplined when you don’t follow the rules?” To determine the protectiveness of parental discipline, I compared the impact of “consistent parental discipline” (parents usually or always discipline when rules are not followed) on risk behaviours with that of “inconsistent parental discipline” (parents seldom or never discipline when rules are not followed).

#### **3.10.4 Group membership**

The Eastern Newfoundland questionnaire asked “How often do you take part in a youth group?” with response categories ranging from “almost everyday” to “hardly ever or never.” The Labrador questionnaire asked “Outside of regular school classes, are you a member of any volunteer groups, school groups, sports, church or social groups?” allowing a “yes” or “no” response. These questions were quite different; however, I used them to measure the effect of group membership on risk behaviours with the following comments.

1). By listing examples of groups, the Labrador questionnaire offered a slightly more detailed description of group activities than the Eastern Newfoundland questionnaire. The extra detail in

the Labrador questionnaire may have caused respondents to exclude group activities not specifically identified in the question. Conversely, the description of group activities in Eastern Newfoundland may not have been sufficiently detailed, causing some respondents to overlook less main stream group activities such as volunteering.

2) In Labrador, the question about group activities did not specify the frequency of group participation making it impossible to measure the impact of frequent versus infrequent group activity on risk behaviours. Some respondents in Labrador who report membership in a group might seldom attend, masking the real association between group participation and the various risk behaviours.

To determine the overall protectiveness of group activity, I compared the impact of some/any group involvement on risk behaviour with that of “no or hardly any” group involvement.

### **3.11 Age of respondents**

I divided respondents into two age groups - those under the age of sixteen and those aged sixteen and over. This regrouping allowed me to compare the occurrence of substance use and unsafe sex among older and younger students. It also allows us to examine the impact of age on the relationship between risk taking and the previously identified positive and negative influencing factors.

### 3.12 Analysis

I completed the epidemiological analysis using Epi-Info<sup>59</sup> public domain software and CIETmap. I calculated basic frequencies for outcomes of interest, which included smoking, drinking, drug taking and having unsafe sex. I then stratified these individual risk behaviours by sex, age group and survey region to identify special risk groups.

The next step of my risk analysis, involved testing for associations between each of the risk behaviours (outcomes) and the preventive and facilitating factors (exposures) described above (sections 3.9 and 3.10). Identified associations were expressed as odds ratios describing the likelihood of an outcome occurring in the exposed group compared with the unexposed group. Where associations existed, I used Cornfield's method to calculate the 95% confidence intervals<sup>60</sup> providing upper and lower values for the strength of the observed association.

To identify confounding variables, I stratified associations of interest by other variables in the data set. I identified confounding by comparing the crude odds ratio before stratification and the Mantel - Haenszel<sup>61</sup> weighted odds ratio resulting from stratification. When the weighted Mantel - Haenszel differed from the crude odds ratio by less than 0.10, I reported the crude odds ratio. When confounding was observed, I reported the Mantel and Haenszel weighted odds ratio with its corresponding 95% confidence interval. Odds ratios and confidence intervals are reported to one decimal place.

Stratification was also used to identify and describe effect modification. Woolf's<sup>62</sup> P-value was used to identify effect modification across strata. When Woolf's P-value was calculated to be less than 0.05, the association between exposure and outcome, expressed as an odds ratio with accompanying confidence interval was reported for each strata.

### **3.1.3 The combined effect of study variables**

Using CIETmap, I completed logistic regression models for each of the risk behaviours; drinking, smoking, drug use and unsafe sex. I included each factor associated with the risk behaviour under examination in an initial saturated logistic regression model. With each calculation, the factor with the lowest Mantel Haenszel chi square score was eliminated leaving a final regression model that contained only those factors that retained their association with the risk behaviour outcome (retained a Mantel Haenszel chi square score  $>3.84$ ).<sup>63</sup>

When preparing these logistic regression models, I noted from earlier sequential stratification that the associations between each of the four risk behaviours and the other protective and promotive factors in the study were stronger among the younger age group compared with the older age group. The differences were not extreme and a similar effect was always observed in both age groups, just more marked among the younger age group. In no instance was a study factor protective against risk taking in one age group and promotive of risk taking in the other.

## **4. Results**

A total of 4894 students from 24 schools in Eastern Newfoundland and 1728 students from 10 schools in Labrador participated. The schools included junior high schools (grades seven to nine), senior high schools (grades ten to twelve) and all grade schools (grades seven through twelve). Youth in these grades ranged from age eleven to nineteen years.

Regional response rates were similar with 81% in Eastern Newfoundland and 80% in Labrador based on the student enrolment estimates provided by the participating schools. While research teams did not ask respondents about their ethnicity, the population was predominately white.

Aboriginal respondents (3%-181/6622) came from two communities within the Health Labrador region. The ratio of males to females was similar in both regions as was the proportion of youth under the age of sixteen (Table 1).

### **4.1 Smoking behaviour**

Overall, some 40%(2601/6587) of respondents reported “any” smoking. Of these, 28%(1838/6587) reported smoking every day and 10%(674/6587) reported smoking heavily (more than 10 cigarettes per day) (Table 2). Some 95%(1412/1491) of males and 96%(1561/1628) of females who ever smoked had their first cigarette before the age of sixteen (Table 3).

An equal proportion of males (40% -1283/3246) and females (39% -1313/3331) reported smoking at least occasionally (OR 1.0, 95%CI 0.9-1.1) (Table 2). Males were more likely than

females to smoke regularly (OR 1.2, 95%CI 1.1-1.3; 973/3246 males versus 862/3331 females) and to smoke heavily (OR 1.9, 95%CI 1.6-2.3; 429/3246 males versus 243/3331 females).

Smoking at all levels (any, regular, heavy) increased as age increased (Tables 4-6); however, for analysis within this report, I compared those under the age of sixteen with those aged sixteen and over. Respondents aged sixteen or over were more likely than younger respondents to report any smoking (OR 2.0, 95%CI 1.8-2.3; 1247/2492 respondents aged sixteen and older versus 1349/4084 respondents under sixteen), to report smoking every day (OR 2.5, 95%CI 2.3-2.8; 988/2492 respondents aged sixteen and older versus 846/4084 respondents under sixteen) and to report smoking heavily (OR 3.0, 95%CI 2.5-3.5; 415/2492 respondents age sixteen and older versus 257/4084 respondents under sixteen).

Respondents in Eastern Newfoundland were more likely than respondents in Labrador to report both occasional smoking (OR 1.4, 95%CI 1.2-1.6; 2029/4893 respondents from Eastern Newfoundland versus 587/1725 respondents from Labrador) and regular (daily) smoking (OR 1.2, 95%CI 1.1-1.4; 1419/4893 respondents from Eastern Newfoundland versus 431/1725 respondents from Labrador).

I observed no difference in the reporting of regular smoking between females in the two regions (OR 1.0, 95%CI 0.8-1.2; 635/2454 females from Eastern Newfoundland versus 227/877 females from Labrador); however, I found males in Eastern Newfoundland were 50% more likely to report smoking regularly (at least one cigarette daily) compared with males in Labrador (OR 1.5,

95%CI 1.2-1.8; 770/2405 males in Newfoundland versus 203/841 males in Labrador). The largest regional differences in regular smoking occurred among those aged twelve and younger and among those aged eighteen and over. Among those under the age of twelve, respondents from Labrador were twice as likely to smoke compared with Eastern Newfoundland respondents (OR 2.0, 95%CI 1.1-3.9; 23/276 respondents from Labrador versus 24/562 respondents from Newfoundland). Among those aged 18 and older, youth from Labrador were three times as likely to smoke compared with those from Eastern Newfoundland (OR 2.9, 95%CI 1.4-5.9; 50/66 respondents from Labrador versus 68/130 respondents from Newfoundland) (Table 5).

#### **4.2 Drinking behaviour**

Over half (56%-3680/6618) of all respondents reported that they drank and approximately one third (30% -1989/6577) reported drinking regularly (more than once a month in the last six months) (Table 7). Males were more likely than females to report any drinking (OR 1.2, 95%CI 1.0-1.3; 1882/3269 males versus 1791/3339 females) and to report drinking regularly. Males under the age of sixteen were one and a half times as likely compared with females in that age group to drink regularly (OR 1.5, 95%CI 1.3-1.8; 502/1955 males versus 388/2112 females). In the older age group, males were twice as likely as females to report drinking regularly (OR 2.0, 95%CI 1.7-2.4; 669/1286 males versus 423/1204 females). Overall, 96%(2031/2127) of males and 95%(1947/2039) of females who drank at all, had their first drink before the age of sixteen (Table 8).

Reports of any drinking and regular drinking in the last six months both increased as age increased (Table 9-10). A respondent aged sixteen or older was four times as likely as a younger respondent to report that they drank any (OR 4.0, 95%CI 3.6-4.5; 1894/2507 respondents aged sixteen and older versus 1779/4100 respondents under the age of sixteen) and also that they drank regularly. Older males were three times as likely as younger males to drink regularly (OR 3.1, 95%CI 2.7-3.7; 669/1286 males aged sixteen and older versus 502/1955 males under the age of sixteen) while older females were two and a half times as likely to drink regularly compared with younger females (OR 2.4, 95%CI 2.0-2.8; 423/1204 females aged sixteen and older versus 388/2112 females under the age of sixteen).

Regionally, the rates of regular drinking did not vary significantly among females (OR 1.1, 95%CI 0.95-1.1; 615/2449 females from Eastern Newfoundland versus 198/872 females from Labrador); however, males in Eastern Newfoundland were more likely to report regular drinking compared with males in Labrador (OR 1.5, 95%CI 1.3-1.8; 925/2404 males in Eastern Newfoundland versus 247/842 males in Labrador). The rate of regular drinking did not vary regionally among respondents aged sixteen and older (OR 1.0, 95%CI 0.9-1.3; 831/1881 respondents from Eastern Newfoundland versus 264/612 respondents from Labrador); however, younger respondents in Eastern Newfoundland were more likely to report regular drinking compared with younger respondents in Labrador (OR 1.6, 95%CI 1.3-1.9; 709/2973 respondents from Eastern Newfoundland versus 182/1100 respondents from Labrador).

### **4.2.1 Drinking and driving**

Overall, some 11%(692/6548) of respondents reported driving after drinking. Males were more likely to drink and drive compared with females in both the younger (OR 2.8, 95%CI 2.2-3.6; 258/1942 males versus 107/2100 females ) and the older age groups (OR 5.2, 95%CI 3.8-7.2; 265/1283 males versus 57/1203 females). Older males were more likely to drink and drive compared with males under the age of sixteen (OR 1.7, 95%CI 1.4-2.1; 265/1283 males aged sixteen and older versus 258/1942 males under the age of sixteen). While males in Eastern Newfoundland were more likely to drink and drive compared with males in Labrador (OR 1.4, 95%CI 1.1-1.7; 412/2391 males in Eastern Newfoundland versus 112/839 males in Labrador), females in Eastern Newfoundland were only half as likely to drink and drive as females in Labrador (OR 0.5, 95%CI 0.3-0.7; 96/2432 females from Eastern Newfoundland versus 69/876 females from Labrador).

### **4.3 Drug use**

Over a third (34%-2254/6602) of all respondents reported ever using drugs and approximately one quarter (27%-1784/6586) reported using drugs in the last six months (Table 11). Overall, 84% (1004/1198) of males and 85%(881/1039) of females who had ever used drugs had done so before the age of sixteen (Table 12).

Males were more likely compared with females to report that they had tried drugs (OR 1.3, 95%CI 1.2-1.4; 1208/3257 males versus 1044/3335 females ) and to report that they had used drugs in the last six months (OR 1.5, 95%CI 1.4-1.7; 1015/3244 males versus 768/3333 females).

Significant differences in the rates of recent drug use between males and females began to occur at age thirteen (Table 14).

Reports of any drug use and regular drug use both increased as age increased (Table 13-14).

Respondents aged sixteen and over were three and a half times as likely as respondents under the age of sixteen to report having tried drugs (OR 3.6, 95%CI 3.3-4.1; 1307/2503 respondents aged sixteen and older versus 942/4088 respondents under the age of sixteen) and three times as likely to have used drugs in the last six months (OR 2.9, 95%CI 2.6-3.2; 1005/2497 respondents aged sixteen and older versus 74/4078 respondents under the age of sixteen).

In terms of regional differences in “any” drug use, I found male respondents in Eastern Newfoundland and Labrador were equally likely to have ever used drugs (OR 1.0, 95%CI 0.9-1.0; 314/842 males in Labrador versus 894/2415 males in Eastern Newfoundland); however female respondents in Labrador were nearly 50% more likely to have tried drugs compared with female respondents in Eastern Newfoundland (OR 1.4, 95% CI 1.2-1.7; 323/874 females in Labrador versus 721/2461 females in Newfoundland).

I found regional differences in “recent” drug use only among those respondents aged twelve or younger at the time of the survey. Respondents from Labrador in this age group were over three times as likely to have used drugs in the last six months compared with Eastern Newfoundland respondents of a similar age (OR 3.5, 95%CI 1.6-7.5; 21/276 respondents from Labrador versus 13/558 respondents from Newfoundland).

#### **4.4 Sexual behaviour**

I examined three components of sexual activity: 1) number of youth who ever had sex, 2) number of youth who'd been sexually active in the last six months and 3) the number of youth who had unprotected or unsafe sex in the last six months. Tables 17-20 illustrate how sexual activity, sex with multiple partners and unsafe sexual activity increases as age increases.

##### **4.4.1 Proportion who were ever sexually active**

Over a third (35%-2282/6570) of all respondents reported ever having sex (Table 15). Overall, 81%(954/1184) of males and 80%(872/1096) of females who had ever been sexually active had their first sexual activity before the age of sixteen (Table 16). Table 17 illustrates how sexual activity increases as age increases.

I found no statistical difference in the reporting of any sexual activity between males and females aged sixteen or over (OR 0.9, 95%CI 0.8-1.1; 721/1281 males versus 703/1208 females ); however among those under the age of sixteen, males were more likely than females to report that they'd had sexual intercourse (OR 1.4, 95%CI 1.2-1.6; 458/1954 males versus 390/2108 females).

Older respondents were more likely to have been sexually active compared with younger respondents. Older males were four times as likely to have been sexually active compared with younger males (OR 4.2, 95%CI 3.6-4.9; 721/1281 males aged sixteen and older versus 458/1954 males under the age of sixteen) while older females were six times as likely to have been sexually

active compared with females under the age of sixteen (OR 6.1, 95%CI 5.2-7.2; 703/1208 females aged sixteen and older versus 390/2108 females under the age of sixteen)

Respondents from Eastern Newfoundland were more likely to have ever had sex compared with respondents from Labrador (OR 1.3, 95%CI 1.1-1.4; 1751/4859 respondents from Eastern Newfoundland versus 531/1711 respondents from Labrador).

#### **4.4.2 Sexual activity in the last six months**

Some 30% (1940/6476) reported being sexually active in the last six months (Table 15). Table 18 illustrates how recent sexual activity increases as age increases. Older respondents were more likely to have been sexually active in the last six months. Older males were four times as likely as younger males to have been sexually active in the last six months (OR 4.3, 95%CI 3.6-5.1; 602/1253 males aged sixteen and older versus 340/1911 males under the age of sixteen). Older females were nearly six times as likely as younger females to have been sexually active in the last six months (OR 5.7, 95%CI 4.8-6.8; 641/1201 females aged sixteen and older versus 349/2094 females under the age of sixteen).

Older females were also slightly more likely than older males to have been sexually active in the last six months (OR 1.2, 95%CI 1.1-1.5; 641/1201 females aged sixteen and older versus 602/1253 males aged sixteen and older). Respondents from Eastern Newfoundland were more likely to have been sexually active in the last six months compared with those in Labrador (OR

1.2, 95%CI 1.1-1.4; 1477/4767 respondents from Eastern Newfoundland versus 463/1709 respondents from Labrador).

Some 9% (592/6412) reported having more than one partner during the last six months. Table 19 illustrates how the proportion of youth having multiple sex partners increased as age increased. Respondents aged sixteen and older were nearly three times as likely to have had multiple sex partners in the last six months compared with younger respondents (OR 2.8, 95%CI 2.3-3.3; 360/2444 respondents aged sixteen and older versus 231/3959 respondents under the age of sixteen). Males were one and a half times as likely as females to have had multiple sex partners (OR 1.6, 95%CI 1.3-1.9; 347/3126 males versus 242/3278 females). No significant difference in the reporting of multiple partners in the last six months was noted between the regions.

#### **4.4.3 Unsafe sex in the last six months**

Overall some 16% (1030/6409) of all respondents had unprotected sex in the last six months. Older respondents were four and a half times as likely to report unprotected sex compared with younger respondents (OR 4.5, 95%CI 3.8-5.2; 698/2438 respondents aged sixteen and older versus 328/3963 respondents under the age of sixteen). Females were more likely to have unprotected sex compared with males (OR 1.3, 95%CI 1.1-1.5; 583/3278 females versus 446/3123 males). No significant differences in the reporting of unsafe sexual activity between males and females was observed until the age of fifteen (Table 20).

When I considered only those who were sexually active in the last six months (by excluding from our definition of “safe” sex those who abstained) some 53% ( 1030/1937) of sexually active adolescents had unprotected sex. Among the sexually active, older respondents were only one and a half times as likely to have unprotected sex compared with younger respondents (OR 1.4, 95%CI 1.2-1.8; 698/1239 respondents aged sixteen and older versus 328/694 respondents under the age of sixteen). When I considered only the sexually active, females were one and a half times as likely to have had unprotected sex compared with males (OR 1.6, 95%CI 1.3-1.9, 583/993 females versus 446/941 males).

#### **4.5 The relationship between risk behaviours**

In terms of substance use, drinking was the risk behaviour most common among adolescents in this study (56% reported any drinking and 28% reported drinking more than once a month in the last six months) followed by smoking (40% reported any smoking and 28% reported smoking everyday) and drug use (37% reported ever having used drugs and 27% reporting use in the last six months).

Some 45% (2934/6524) of respondents indulged in at least one form of regular substance use (drinking, smoking or drugs) with 13% (841/6524) smoking drinking and using drugs regularly and 28% (1806/6524) involved in at least two forms of risk behaviour (Table 21). Multiple substance use (two or more) was more likely to occur among those aged sixteen and over compared with the younger age group (OR 3.0, 95%CI 2.7-3.4; 1027/2476 respondents aged

sixteen and older versus 775/4037) respondents under the age of sixteen and among males compared to females (OR 1.6, 95%CI 1.4-1.7; 1030/3208 males versus 773/3307 females).

#### **4.5.1 Smoking and drinking**

Some 56% (1113/1984) of regular drinkers smoked everyday compared with 16% (719/4567) of non or occasional drinkers (OR 6.8, 95%CI 6.1-7.7). The association between regular drinking and smoking was stronger among those under the age of sixteen. Those respondents under the age of sixteen who drank regularly were over eight times as likely to smoke compared with non or occasional drinkers in this age group (OR 8.4, 95%CI 7.1-10.1; 470/888 regular drinkers who smoked versus 374/3168 non/occasional drinkers who smoked). Among respondents aged sixteen and over, those who drank regularly were four times as likely to also smoke regularly compared with non or occasional drinkers (OR 4.3, 95%CI 3.6-5.2; 641/1093 regular drinkers who smoked versus 343/1391 non/occasional drinkers who smoked). The association between drinking and smoking did not differ significantly between the sexes nor between the two survey regions.

#### **4.5.2 Smoking and Drug use**

Some 65% (1162/1780) of those who had used drugs in the last six months smoked compared with 14% (672/4776) of non-drug users (OR 11.5, 95%CI 10.1-13.1). As with drinking, I found the association between using drugs and smoking to be stronger among those under the age of sixteen (OR 15.7, 95%CI 13.0-19.1; 500/772 drug users who smoked versus 344/3290 non drug users who smoked) compared with those aged sixteen and older (OR 6.7, 95%CI 5.6-8.1;

658/1003 drug users who smoked versus 328/1480 non drug users who smoked). The association between drug use and smoking does not differ significantly between the sexes nor the two survey regions.

#### **4.5.3 Smoking and Unsafe sex**

Some 61% (630/1021) of those who reported having unsafe sex in the last six months smoked compared to 21% (1135/5371) of those who had not had unsafe sex (OR 6.0, 95%CI 5.2-7.0).

The association between smoking and not practising safe sex was stronger among those under the age of sixteen (OR 8.5, 95%CI 6.6-10.9; 205/327 respondents having unsafe sex who smoked versus 600/3621 respondents not having unsafe sex who smoked) compared with those aged sixteen and older (OR 3.6, 95%CI 2.9-4.3; 424/694 respondents having unsafe sex who smoked versus 530/1730 respondents not having unsafe sex who smoked). The association between smoking and unsafe sex was stronger in Labrador (OR 7.8, 95% CI 5.8-10.6; 160/251 respondents having unsafe sex who smoked versus 266/1452 respondents not having unsafe sex who smoked) compared with Eastern Newfoundland (OR 5.5, 95%CI 4.7-6.5; 472/774 respondents having unsafe sex who smoked versus 864/3903 respondents not having unsafe sex who smoked).

#### **4.5.4 Drinking and drug use**

Some 69% (1222/1776) of regular drug users drank compared to 16% (762/472) of non-drug users (OR 11.6, 95%CI 10.2-13.2). The association between drinking and drug use was stronger among those respondents under the age of sixteen compared with the older age group. Older

respondents who used drugs were seven and a half times as likely to also drink compared with non-drug users in this age group (OR 7.7, 95%CI 6.4-9.3; 721/1001 drug users who drank versus 372/1484 non drug users who drank). Among respondents under the age of sixteen, those who used drugs were over thirteen times as likely to also drink compared with non-drug users (OR 13.7, 95%CI 11.4-16.5; 499/770 drug users who drank versus 389/3282 non drug users who drank). The relationship between drinking and drug use was stronger in Labrador (OR 14.9, 95%CI 11.4-19.6; 307/469 drug users who drank versus 140/1242 non drug users who drank) compared with Eastern Newfoundland (OR 10.9, 95%CI 9.4-12.7; 915/1307 drug users who drank versus 622/3530 non drug users who drank).

#### **4.5.5 Drinking and unsafe sex**

Some 60% (615/1020) of respondents who had unsafe sex in the last six months reported drinking regularly compared with 24% (1291/5366) who had not had unsafe sex (OR 4.8, 95%CI 4.2-5.5). Respondents aged sixteen or older who had unprotected sex were three times as likely to report regular drinking compared with respondents in this age group who did not have unprotected sex (OR 2.7, 95%CI 2.2-3.2; 424/694 respondents having unsafe sex who drank versus 638/1732 respondents not having unsafe sex who drank). Among younger respondents, those who had unsafe sex were seven times as likely to report regular drinking compared with abstainers/condom users in this age group (OR 6.6, 95% CI 5.2-8.4; 192/326 respondents having unsafe sex who drank versus 646/3614 respondents not having unsafe sex who drank).

#### **4.5.6 Drugs use and unsafe sex**

Some 62% (630/1022) of respondents who had unsafe sex in the last six months reported using drugs compared with 20% (1086/5373) who had not had unsafe sex (OR 6.3, 95%CI 5.4-7.3). I found the association between having unprotected sex and drug use to be stronger among those under the age of sixteen (OR 9.4, 95%CI 7.2-12.1; 201/326 respondents having unsafe sex who used drugs versus 539/3620 respondents not having unsafe sex who used drugs) compared with the group aged sixteen and over (OR 3.4, 95%CI 2.8-4.2; 426/696 respondents having unsafe sex who use drugs versus 545/1733 respondents not having unsafe sex who use drugs). The association between drug use and unsafe sex was stronger in Labrador (OR 8.6, 95%CI 6.3-11.7; 172/250 respondents having unsafe sex who use drugs versus 297/1455 respondents not having unsafe sex who use drugs) compared with Eastern Newfoundland (OR 5.8, 95%CI 4.9-6.8; 459/776 respondents having unsafe sex who use drugs versus 787/3902 respondents not having unsafe sex who use drugs ).

### **4.6. Factors that promote risk taking**

#### **4.6.1 Peer risk behaviour**

##### **4.6.1.1 Peer drinking**

Overall, some 57% (3736/6600) of respondents reported that the majority of their friends drank (Table 22). Respondents aged sixteen and over were more likely to report the majority of their friends drank compared with the younger age group. Older males were nearly six times as likely to report having many drinking friends compared with younger males (OR 5.7, 95%CI 4.8-6.7; 1019/1289 males aged sixteen or older versus 788/1967 males under the age of sixteen); while

older females were over four times as likely to report a majority of drinking friends compared with younger females (OR 4.4, 95%CI 3.7-5.2; 953/1211 females aged sixteen and older versus 967/2114 females under the age of sixteen).

#### **4.6.1.2 Peer drug use**

Overall, a quarter of respondents ((1700/6584) reported that the majority of their friends used drugs (Table 22). Respondents over the age of sixteen were more likely to report a majority of drug using friends than younger respondents (OR 3.1, 95%CI 2.8-3.5; 986/2499 respondents aged sixteen and older versus 710/4074 respondents under the age of sixteen).

#### **4. 6.1.3 Smoking and peer risk behaviour**

Some 41% (1547/3720) of those who reported having many drinking friends smoked compared with 10% (289/2846) of those with few or no drinking friends (OR 6.3, 95%CI 5.5-7.3). The association between smoking and having many drinking friends was stronger among those under sixteen (OR 7.2, 95%CI 6.0-8.7; 663/1749 respondents who have many drinking friends versus 181/2319 respondents who have few drinking friends) compared with the older age group (OR 3.1, 95%CI 2.5-3.9; 880/1966 respondents who have many drinking friends versus 108/522 respondents who have few drinking friends). The association between smoking and having friends who drank was stronger in Eastern Newfoundland (OR 7.6, 95%CI 6.4-9.1; 1243/2969 respondents having many friends who drink versus 163/1886 respondents having few friends who drink) compared with Labrador (OR 4.5, 95%CI 3.5-5.8; 304/751 respondents having many drinking friends versus 126/960 respondents having few drinking friends).

I found a similar association between smoking and having drug using friends. Some 58% (990/1695) of youth with many drug using friends smoked compared with 17% (843/4858) of youth with few drug using friends (OR 6.7, 95%CI 5.9-7.6). This association between smoking and having many drug using friends was stronger among those under sixteen (OR 8.2, 95%CI 6.9- 9.9; 396/708 respondents having many drug using friends versus 447/3350 respondents having few drug using friends) compared with the older age group (OR 4.2, 95% CI 3.5-5.0; 590/983 respondents having many drug using friends versus 396/1501 respondents having few drug using friends).

#### **4.6.1.4 Drinking and peer risk behaviour**

Some 90% (1799/1988) of regular drinkers reported the majority of their friends drank compared with 42% (1922/4573) of non/occasional drinkers (OR 13.1, 95%CI 11.1-15.5). The association between having friends who drank and self-reported drinking was stronger among respondents under the age of sixteen than the older age group. A youth under the age of sixteen who said the majority of his/her friends drank was thirteen times as likely to report drinking regularly compared with a youth in this age group with few or no friends who drank (OR 13.3, 95%CI 10.8-16.5; 764/1749 respondents having many friends who drank versus 127/2313 respondents having few friends who drank) whereas a youth aged sixteen or older with many friends who drank was eight times as likely to drink regularly compared with a youth in this age group with non-drinking friends (OR 8.2, 95%CI 6.1-11.0; 1032/1967 respondents having many friends who drank versus 62/522 respondents having few friends who drank). The association between

regular drinking and having many friends who drank varied little between the sexes or between the two surveyed regions.

I found a similar association between regular drinking and having friends who used drugs. Some 53% ( 1062/1982) of regular drinkers reported that the majority of their friends used drugs compared with 14% ( 633/4562) of occasional or non-drinkers (OR 7.2, 95%CI 6.3-8.1). The association between a youth's reported drinking and the number of his/her friends who used drugs was stronger among those under the age of sixteen (OR 8.0, 95%CI 6.6-9.6; 405/708 respondents with many drug using friends versus 480/3339 with few drug using friends) than among the older age group (OR 4.8, 95%CI 4.1-5.8; 655/983 respondents having many drug using friends versus 439/1503 respondents having few drug using friends).

#### **4.6.1.5 Drug use and peer risk behaviour**

Some 67% (1183/1778) of recent drug users reported the majority of their friends used drugs compared with 11% ( 511/4782) of non-recent drug users (OR 16.6 95%CI 14.5-19.1). The association between using drugs and having drug using friends was stronger among respondents under the age of sixteen (OR 19.7, 95%CI 16.1-24.1; 467/706 respondents having many drug using friends versus 303/3350 respondents having few/no drug using friends) than among those aged sixteen and older (OR 10.9, 95%CI 9.0-13.3; 712/984 respondents having many drug using friends versus 291/1509 respondents having few drug using friends).

Some 88% (1584/1781) of recent drug users reported having many drinking friends compared with 45% (2137/4786) of non-drug users (OR 9.9, 95%CI 8.5-11.7). This association was stronger among those under the age of sixteen (OR 10.7, 95%CI 8.6-13.2; 650/1747 respondents having many drinking friends versus 122/2316 respondents having few drinking friends) than among older respondents (OR 5.5, 95%CI 4.2-7.2; 930/1969 respondents having many drinking friends versus 74/525 respondents having few drinking friends).

#### **4.6.1.6 Unsafe sexual activity and peer risk behaviour**

Some 24% (887/3628) of youth with many drinking friends reported having unsafe sex compared with 5% (140/2773) of those with few or no drinking friends. The association between having many friends who drank and unsafe sexual activity was stronger among those under sixteen (OR 6.3, 95%CI 4.7-8.5; 262/1687 respondents having many friends who drank versus 64/2263 respondents having few friends who drank) compared with the older age group (OR 2.8, 95%CI 2.1-3.6; 622/1927 respondents having many friends who drank versus 75/507 respondents having few friends who drank). The association between having unsafe sex and having many friends who drank was stronger in Eastern Newfoundland (OR 7.9, 95%CI 6.1-10.3; 706/2873 respondents having many friends who drank versus 72/1817 respondents who had no/few friends who drank) compared with Labrador (OR 4.2, 95%CI 3.1-5.7; 181/745 respondents having many friends who drank versus 68/956 respondents having few friends who drank).

Some 36% (583/1633) of youth who had many drug using friends reported having unsafe sex compared with 9% (445/4747) of those reporting few or no drug using friends (OR 5.4, 95%CI 4.7 -6.2). The association between having many drug using friends and unsafe sexual practices was stronger among those under sixteen (OR 7.3, 95%CI 5.7-9.3; 176/678 respondents having many friends who used drugs versus 151/3264 respondents having few friends who used drugs ) than among the older age group (OR 3.0 95% CI 2.5-3.6; 404/952 respondents having many drug using friends versus 293/1478 respondents having few drug using friends).

#### **4.6.2 Exposure to unwanted sexual activity**

##### **4.6.2.1 The prevalence of unwanted sex**

Overall some 16% (1015/6500) of respondents had experienced unwanted sexual activity (Table 23). In both age groups, females were more likely to have experienced unwanted sexual activity compared with males. Females under the age of sixteen were one and a half times as likely to have had unwanted sex compared with males in that age group (OR 1.5, 95%CI 1.3-1.9; 338/2080 females versus 216/1918 males). Older females were three times as likely to have had unwanted sex compared with similarly aged males (OR 3.1, 95% CI 2.4-3.8; 321/1205 females versus 136/1278 males). Older females were twice as likely to have been involved in unwanted sexual activity compared with younger females (OR 1.9, 95%CI 1.6-2.2; 321/1205 females aged sixteen and older versus 338/2080 females under the age of sixteen). Respondents from Eastern Newfoundland were twice as likely to report unwanted sexual activity compared with respondents from Labrador (OR 2.0, 95%CI 1.7-2.4; 852/4804 Eastern Newfoundland versus 163/1696 Labrador).

#### **4.6.2.2 Smoking and exposure to unwanted sex**

Some 49% (486/1006) of those who had experienced unwanted sexual activity smoked everyday compared with 24% (1323/5464) of those who had not experienced unwanted sexual activity (OR 3.0, 95%CI 2.6-3.4). The association between smoking and unwanted sex was stronger among those under the age of sixteen (OR 3.8, 95%CI 3.1-4.7; 241/548 respondents experiencing unwanted sex versus 586/3439 respondents not experiencing unwanted sex) compared with the older age group (OR 2.1, 95%CI 1.7-2.6; 246/455 respondents experiencing unwanted sex versus 734/2017 respondents not experiencing unwanted sex). The association between smoking and unwanted sex was stronger in Labrador (OR 4.1, 95%CI 2.9-5.9; 87/161 respondents experiencing unwanted sex versus 338/1529 respondents not experiencing unwanted sex) compared with Eastern Newfoundland (OR 2.7, 95%CI 2.3-3.2; 401/845 respondents experiencing unwanted sex versus 985/3935 respondents not experiencing unwanted sex).

#### **4.6.2.3 Drinking and exposure to unwanted sex**

Youth who reported experiencing unwanted sex were more likely to drink. Some 47% (474/1009) of those who had unwanted sex reported drinking more than once a month in the last six months compared to 27% (1490/5455) of those who had never experienced unwanted sex (OR 2.4, 95%CI 2.1-2.7). The association between unwanted sexual activity and drinking was stronger among those under sixteen (OR 3.1, 95%CI 2.6-3.8; 230/548 respondents experiencing unwanted sex versus 642/3431 respondents not experiencing unwanted sex) compared with the older age group (OR 1.6, 95%CI 1.3-1.9; 243/458 respondents experiencing unwanted sex versus 846/2016 respondents not experiencing unwanted sex).

#### **4.6.2.4 Drug use and exposure to unwanted sex**

Drug use was associated with having experienced unwanted sexual activity. Some 43% (431/1009) of those who'd had forced sex had also used drugs in the last six months compared with 24% (1332/ 5462) of those who had never had forced sex (OR 2.3, 95%CI 2.0 -2.7). The association was stronger among those under the age of sixteen (OR 3.0, 95%CI 2.5-3.7; 203/552 respondents who experienced unwanted sex versus 558/3432 respondents not experiencing unwanted sex) than among those aged sixteen and over (OR 1.6, 95%CI 1.3-2.0; 226/454 respondents experiencing unwanted sex versus 771/2022 respondents not experiencing unwanted sex).

#### **4.6.2.5 Unsafe sex and exposure to unwanted sex**

Some 34% (326/966) of those who had ever experienced unwanted sex reported having unsafe sex in the last six months compared with 13% ( 698/5381) of those who had not experienced unwanted sex (OR 3.4, 95%CI 2.9-4.0). The association between having experienced unwanted sexual activity and having unprotected sex was stronger among those under the age of sixteen (OR 5.2, 95%CI 4.0-6.7; 127/520 respondents experiencing unwanted sex versus 198/3391 respondents not experiencing unwanted sex ) than among those aged sixteen and over (OR 2.4, 95%CI 1.9-3.0; 197/444 respondents experiencing unwanted sex versus 498/1984 respondents not experiencing unwanted sex).

## **4.7 Factors that prevent risk taking**

### **4.7.1 Family Intactness**

Overall, some 80% (5237/6562) of respondents lived with both parents (Table 24). Respondents from Eastern Newfoundland were twice as likely to report living in an intact family compared with respondents from Labrador (OR 1.9, 95%CI 1.7-2.2; 4004/4835 Eastern Newfoundland versus 1233/1727 Labrador).

#### **4.7.1.1 Family intactness and smoking**

Some 25% (1290/5215) of respondents from intact households smoked compared with 40% (531/1315) from reconstituted or one parent homes (OR 0.5, 95%CI 0.4-0.6); however living in an intact household was less protective in Eastern Newfoundland (OR 0.5, 95%CI 0.4-0.6; 1054/3989 respondents from intact households versus 335/822 respondents from non-intact households) compared with Labrador (OR 0.4, 95%CI 0.3-0.5; 236/1226 respondents from intact households versus 196/493 respondents from non-intact households).

Family intactness was more protective against smoking among non-drinkers (OR 0.4, 95%CI 0.4-0.5; 489/3700 respondents from intact households versus 220/823 respondents from non-intact households) compared with regular drinkers (OR 0.6, 95%CI 0.5-0.8; 795/1489 respondents from intact households versus 311/484 respondents from non-intact households) and among those who reported few drinking friends (OR 0.4, 95%CI 0.3-0.5; 185/2301 respondents from intact households versus 100/511 respondents from non-intact households) compared with those who reported many drinking friends (OR 0.5, 95%CI 0.4-0.6; 1103/2899 respondents from intact

households versus 431/799 respondents from non-intact households). Controlling for respondent drug use and having many drug using did not explain the protective association between family intactness and smoking.

#### **4.7.1.2 Family intactness and drinking**

Overall some 29% ( 1492/5207) of respondents from intact households reported drinking regularly in the last six months compared with 37% ( 485/1314) of those from non-intact households (OR 0.7, 95%CI 0.6-0.8): however, an apparent protective association between drinking and family intactness was explained when I stratified by individual drug use in the last six months..

#### **4.7.1.3 Family intactness and drug use**

Overall, some 24% (1272/5209) of respondents from intact households reported drug use in the last six months compared with 38% ( 502/1318) of those from non-intact homes (OR 0.5, 95% CI 0.4-0.6). Controlling for respondent smoking, drinking, and association with drinking friend or drug using friends did not explain the protectiveness association between family intactness and drug use.

#### **4.7.1 .4 Family intactness and unsafe sex**

Some 14% ( 713/5081) respondents from intact households reported having unsafe sex in the last six months compared with 24% ( 311/1280) of respondents from non-intact households (OR 0.5, 95%CI 0.4-0.6). Controlling for the respondent smoking, drinking and association with drinking

friend or drug using friends did not explain the protective association between family intactness and unsafe sex.

#### **4.7.2 Parental knowledge**

Some 61% (3988/6567) of respondents reported that their parents always or usually knew their whereabouts when they were not at home (Table 25). Younger females were no less likely than older females to report their parents usually knew their whereabouts; however, males under the age of sixteen were one and a half times as likely to report that their parents usually knew their whereabouts compared with males in the older age group (OR 1.5, 95%CI 1.3-1.7; 1109/1941 males under the age of sixteen versus 607/1285 males aged sixteen and older).

In both age groups, females were more likely than males to report that their parents usually or always knew their whereabouts. Among those under the age of sixteen, females were one and a half times as likely to report their parents usually knew their whereabouts (OR 1.7, 95%CI 1.5-1.9; 1454/2113 females versus 1109/1941 males) compared with male respondents. In the older age group females were twice as likely as males to report their parents usually knew where they were (OR 2.2, 95%CI 1.9-2.7; 807/1209 females versus 607/1285 males).

Respondents in Eastern Newfoundland were less likely to report that their parents consistently knew their whereabouts compared with respondents from Labrador (OR 0.8, 95%CI 0.7-0.9; 2880/4857 Eastern Newfoundland versus 1108/1710 Labrador). Respondents who lived in intact households were more likely to report that their parents usually knew their whereabouts

compared with respondents from non-intact home (OR 1.5, 95%CI 1.3-1.7; 3258/5198 respondents from intact households versus 702/1316 respondents from non-intact households).

#### **4.7.2.1 Parental knowledge and smoking**

Some 20% (773/3971) of respondents who reported their parents usually knew their whereabouts smoked everyday compared with 41% ( 1051/2563) of those who reported their parents seldom knew their whereabouts (OR 0.4, 95%CI 0.3-0.4). Parental knowledge of youth whereabouts was more protective against smoking among those under the age of sixteen (OR 0.3, 95%CI 0.3-0.4; 344/2558 respondents reporting parents consistently knew whereabouts versus 492/1483 respondents reporting parents did not consistently know whereabouts) than among older respondents (OR 0.4, 95%CI 0.4-0.5; 429/1408 respondents reporting parents consistently knew whereabouts versus 555/1074 respondents reporting parents did not consistently know whereabouts). Parental knowledge was more protective against smoking in Eastern Newfoundland (OR 0.3, 95%CI 0.3-0.4; 551/2867 respondents reporting parents consistently knew whereabouts versus 847/1964 respondents reporting parents did not consistently know whereabouts) compared with Labrador (OR 0.5, 95%CI 0.4-0.6; 222/1104 respondents reporting parents consistently knew whereabouts versus 204/599 respondents reporting parents did not consistently know whereabouts). Controlling for family intactness, parental rule setting and consistent discipline through sequential stratification did not explain the protective association between parental knowledge and smoking.

The protectiveness of parental knowledge against smoking varied in the presence of other risk behaviours. Parental knowledge was less protective against smoking among those adolescents who drank (OR 0.7, 95%CI 0.6-0.8, 415/819 respondents reporting parents consistently knew whereabouts versus 690/1152 respondents reporting parents did not consistently know whereabouts) compared with non-drinkers (OR 0.4, 95%CI 0.3-0.5; 357/2130 respondents reporting parents consistently knew whereabouts versus 356/1400 respondents reporting parents did not consistently know whereabouts). Parental knowledge was also less protective against smoking among regular drug users (OR 0.7, 95%CI 0.6-0.9, 435/717 respondents reporting parents consistently knew whereabouts versus 722/1057 respondents reporting parents did not consistently know whereabouts) compared with non/occasional drug users (OR 0.4, 95%CI 0.3-0.5; 337/3236 respondents reporting parents consistently knew whereabouts versus 326/1494 respondents reporting parents did not consistently know whereabouts).

Parental knowledge was less protective against smoking among those reporting many friends who drank (OR 0.5, 95%CI 0.4-0.6; 646/1936 respondents reporting parents consistently knew whereabouts versus 890/1763 respondents reporting parents did not consistently know whereabouts) than among those with few or no drinking friends (OR 0.3, 95%CI 0.2-0.3; 126/2021 respondents reporting parents consistently knew whereabouts versus 160/795 respondents reporting parents did not consistently know whereabouts). Similarly, parental knowledge was less protective against smoking among those reporting many friends who used drugs (OR 0.6, 95%CI 0.5-0.7; 369/730 respondents reporting parents consistently knew whereabouts versus 615/955 respondents reporting parents did not consistently know

whereabouts) than among those with few or no drug using friends (OR 0.4, 95%CI 0.2-0.5; 402/3220 respondents reporting parents consistently knew whereabouts versus 434/1597 respondents reporting parents did not consistently know whereabouts).

#### **4.7.2.2 Parental knowledge and drinking**

Some 21% (822/3963) of those respondents who reported their parents usually knew their whereabouts drank regularly in the last six months compared with 45% ( 1154/2563) of those who reported little or no parental knowledge of their whereabouts (OR 0.3, 95%CI 0.29-0.36).

Parental knowledge of whereabouts was less protective against drinking among older respondents (OR 0.4, 95%CI 0.3-0.4; 470/1409 respondents reporting parents consistently knew whereabouts versus 623/1075 respondents reporting parents did not consistently know whereabouts) compared with younger ones (OR 0.3, 95%CI 0.29-0.34; 351/2549 respondents reporting parents consistently knew whereabouts versus 529/1482 respondents reporting parents did not consistently know whereabouts). Controlling for family intactness, parental rule setting and discipline through sequential stratification did not explain the protective association between parental knowledge and drinking.

Parental knowledge of whereabouts was less protective against drinking among those who smoked (OR 0.6, 95%CI 0.5-0.7, 415/772 respondents reporting parents consistently knew whereabouts versus 690/1046 respondents reporting parents did not consistently know whereabouts) compared with those who did not smoked (OR 0.3, 95%CI 0.28-0.38, 404/3177 respondents reporting parents consistently knew whereabouts versus 462/1506 respondents

reporting parents did not consistently know whereabouts). Parental knowledge was also less protective against drinking among those who had used drugs in the last six months (OR 0.6, 95%CI 0.5-0.8; 448/728 respondents reporting parents consistently knew whereabouts versus 771/1052 respondents reporting parents did not consistently know whereabouts) compared with non-drug users (OR 0.4, 95%CI 0.3-0.5; 373/3227 respondents reporting parents consistently knew whereabouts versus 379/1500 respondents reporting parents did not consistently know whereabouts).

Parental knowledge was also less protective against drinking among those with many drug using friends (OR 0.5, 95%CI 0.4-0.6; 397/733 respondents reporting parents consistently knew whereabouts versus 660/952 respondents reporting parents did not consistently know whereabouts) compared with those reporting few drug using friends (OR 0.3, 95%CI 0.3-0.4; 420/3209 respondents reporting parents consistently knew whereabouts versus 493/1601 respondents reporting parents did not consistently know whereabouts). Stratifying by the number of friends who drank did not change the protective association between parental knowledge and respondent drinking.

#### **4.7.2.3 Parental knowledge and drug use**

Some 18% ( 718/3968) of youth who reported their parents usually knew their whereabouts used drugs in the last six months compared with 41% ( 1060/2565) of youth who reported their parents had little or no knowledge of their whereabouts (OR 0.3, 95%CI 0.3-0.4). Again, the protective effect of parental knowledge was weaker in the presence of other risk behaviours. Parental

knowledge was less protective against drug use among adolescents who drank regularly (OR 0.6, 95%CI 0.5-0.7, 448/821 respondents reporting parents consistently knew whereabouts versus 771/1150 respondents reporting parents did not consistently know whereabouts) compared with those who did not drink regularly (OR 0.4, 95%CI 0.3-0.5, 270/3124 respondents reporting parents consistently knew whereabouts versus 281/1402 respondents reporting parents did not consistently know whereabouts). Similarly, parental knowledge offered less protection against drug use among those who smoked regularly (OR 0.6, 95%CI 0.5-0.7, 435/772 respondents reporting parents consistently knew whereabouts versus 722/1048 respondents reporting parents did not consistently know whereabouts) compared with those who did not smoke (OR 0.3, 95%CI 0.3-0.4, 282/3181 respondents reporting parents consistently knew whereabouts versus 335/1503 respondents reporting parents did not consistently know whereabouts). Controlling for peer drinking, peer drug use, family intactness, parental rule setting and parental discipline through sequential stratification did not explain the protective association between parental knowledge and drug use.

#### **4.7.2.4 Parental knowledge and unsafe sex**

Some 12% ( 458/3889) of youth who reported that their parents usually knew their whereabouts had unsafe sex in the six months prior to the survey compared with 23% ( 567/2480) of respondents reporting a low level of parental knowledge (OR 0.5, 95%CI 0.4-0.5). Parental knowledge was more protective against unsafe sex among those under the age of sixteen (OR 0.4, 95%CI 0.3-0.5; 133/2501 respondents reporting parents consistently knew whereabouts versus 193/1431 respondents reporting parents did not consistently know whereabouts) compared with

older respondents (OR 0.6, 95%CI 0.5-0.7; 325/1384 respondents reporting parents consistently knew whereabouts versus 370/1045 respondents reporting parents did not consistently know whereabouts). Within the older age group, parental knowledge was more protective against unsafe sex among males (OR 0.4, 95%CI 0.3-0.5; 97/589 respondents reporting parents consistently knew whereabouts versus 210/646 respondents reporting parents did not consistently know whereabouts) compared with females (OR 0.6, 95%CI 0.5-0.8; 227/793 respondents reporting parents consistently knew whereabouts versus 159/398 respondents reporting parents did not consistently know whereabouts).

Parental knowledge was less protective against unsafe sex among those respondents having many friends who drank (OR 0.6, 95%CI 0.5-0.7; 385/1986 respondents reporting parents consistently knew whereabouts versus 498/1707 respondents reporting parents did not consistently know whereabouts) compared with those reporting that few of their friends drank (OR 0.4, 95%CI 0.3-0.6; 71/1980 respondents reporting parents consistently knew whereabouts versus 68/769 respondents reporting parents did not consistently know whereabouts). Controlling for respondent smoking, drinking, drug use, peer drinking, peer drug use, family intactness, parental rule setting and parental discipline through sequential stratification did not explain the protective association between parental knowledge unsafe sex.

#### **4.7.3 Parental rule setting**

Some 66% (4320/6560) of respondents reported that their parents consistently set rules for them to follow (Table 26). Males were slightly less likely than females to report that their parents

consistently set rules (OR 0.8, 95%CI 0.7-0.9; 2040/3226 males versus 2273/3325 females). Younger respondents were more likely to report that their parents consistently set rules compared with older respondents (OR 1.7, 95%CI 1.5-1.9; 2860/4055 respondents under the age of sixteen versus 1453/2494 respondents aged sixteen and older). Respondents in Eastern Newfoundland were slightly more likely to report that their parents set rules consistently compared with respondents from Labrador (OR 1.3, 95%CI 1.2-1.5; 3277/4852 Eastern Newfoundland versus 1043/1708 Labrador). Respondents from intact households were nearly twice as likely to report that their parents consistently set rules compared with respondents from non-intact families (OR 1.7, 95%CI 1.5-1.9; 3550/5193 respondents from intact households versus 736/1316 respondents from non-intact households).

#### **4.7.3.1 Rule setting and smoking**

Some 23% ( 982/4304) of youth who reported consistent rules setting by parents smoked regularly compared with 38% ( 840/2225) of those who reported their parents seldom set rules for them to follow (OR 0.5, 95%CI 0.4-0.6). Consistent parental rule setting was more protective against smoking in the younger age group (OR 0.5, 95%CI 0.4-0.6; 481/2851 respondents with consistent rule setting versus 355/1188 respondents without consistent rule setting) compared with the older age group (OR 0.6, 95%CI 0.5-0.7; 500/1446 respondents with consistent rule setting versus 482/1033 respondents without consistent rule setting).

Consistent parental rule setting was less protective against smoking among those who used drugs in the last six months (OR 0.7, 95%CI 0.6-0.9; 595/962 respondents with consistent parental rule

setting versus 559/809 respondents without consistent parental rule setting) compared with non-drug users (OR 0.5, 95%CI 0.4-0.6; 385/3325 respondents with consistent parental rule setting versus 279/1404 respondents without consistent parental rule setting). Consistent parental rule setting was less protective against smoking among those who reported many drinking friends (OR 0.6, 95%CI 0.5-0.7; 832/2284 respondents with consistent parental rule setting versus 704/1411 respondents without consistent parental rule setting) compared with those who had few or no friends who drank (OR 0.4, 95%CI 0.3-0.5; 149/2005 respondents with consistent parental rule setting versus 135/811 respondents without consistent parental rule setting). Controlling for family intactness, parental knowledge, consistency of parental discipline, respondent drinking and friend drug use through sequential stratification did not explain the protective association between parental rule setting against smoking.

#### **4.7.3.2 Rule setting and drinking**

Some 25% (1076/4292) of respondents who reported consistent parental rule setting drank regularly in the last six months compared with 40% ( 898/2227) of respondents who reported little or no rule setting by parents (OR 0.5, 95%CI 0.4-0.6). Rule setting was less protective against drinking in Eastern Newfoundland (OR 0.5, 95%CI 0.5-0.6; 885/3256 respondents with consistent parental rule setting versus 646/1566 respondents without consistent parental rule setting) compared with Labrador (OR 0.4, 95%CI 0.3-0.5; 191/1036 respondents with consistent parental rule setting versus 252/661 respondents without consistent parental rule setting).

Controlling for sex, age of respondent, respondent smoking, respondent drug use, association with drinking or drug using friends, family intactness, parental knowledge or parental discipline

through sequential stratification did not explain the protective association between rule setting and drinking.

#### **4.7.3.3. Rule setting and drug use**

Some 22% ( 964/4301) of respondents who reported consistent parental rule setting used drugs in the last six months compared with 36% ( 811/2227) of those who reported little or no rule setting by their parents (OR 0.5, 95% CI 0.4-0.6). Parental rule setting offered less protection against drug use among those who smoked regularly (OR 0.8, 95%CI 0.6-0.9; 595/980 respondents with consistent parental rule setting versus 559/883 respondents without consistent parental rule setting) compared with those who were not regular smokers (OR 0.6, 95%CI 0.5-0.7; 367/3307 respondents with consistent parental rule setting versus 250/1375 respondents without consistent parental rule setting). Controlling for sex, age of respondent, respondent drinking, the number of friends who drank, family intactness, parental knowledge and consistent discipline through sequential stratification did not explain the protective association between consistent parental rule setting and drug use.

#### **4.7.3.4. Rule setting and unsafe sex**

Some 13% (526/4212) of respondents who reported consistent parental rule setting had unsafe sex in the six months prior to the survey compared with 23% (499/2158) of those who reported little or no parental rule setting (OR 0.5, 95%CI 0.4-0.6 ). The protective association between parental rule setting and unsafe sex was stronger among those under the age of sixteen (OR 0.5, 95%CI 0.4-0.6; 176/2786 respondents with consistent parental rule setting versus 149/1148

respondents without consistent parental rule setting) compared with older respondents (OR 0.6, 95%CI 0.5-0.7; 349/1421 respondents with consistent parental rule setting versus 347/1007 respondents without consistent parental rule setting).

Consistent parental rule setting was less protective against unsafe sex among those reporting many friends who drank (OR 0.6, 95%CI 0.5-0.7; 456/2232 respondents with consistent parental rule setting versus 427/1369 respondents without consistent parental rule setting) compared with those respondents reporting few drinking friends (OR 0.4, 95%CI 0.3-0.5; 68/1965 respondents with consistent parental rule setting versus 71/787 respondents without consistent parental rule setting).

Controlling for respondent smoking, respondent drinking, respondent drug use, friend drug use, family intactness, parental knowledge and consistent parental discipline through sequential stratification did not explain the protective association between rule setting and unsafe sex.

#### **4.7.4 Parental discipline**

Some 36% (2371/6546) of respondents reported that their parents consistently disciplined them when they did not follow established rules (Table 27). Some 34% (1106/3221) of males reported consistent discipline compared with 38% (1260/3316) of females (OR 0.9, 95%CI 0.8 -0.95).

Respondents under the age of sixteen were more likely to report consistent parental discipline compared with the older age group. Younger females were one and a half times as likely to report

consistent parental discipline compared with females aged sixteen and over (OR 1.5, 95%CI 1.3-1.7; 868/2103 females under the age of sixteen versus 390/1208 females aged sixteen and older). Younger males were twice as likely to report consistent discipline by parents compared with males aged sixteen and older (OR 1.9, 95%CI 1.7-2.3; 775/1932 males under the age of sixteen versus 330/1284 males aged sixteen and older).

Males and females in the younger age group were equally likely to report consistent parental discipline; however among respondents aged sixteen and older, females were more likely than males to report consistent parental discipline ( OR 1.4, 95%CI 1.2-1.7; 390/1208 versus 330/1284).

Respondents in Eastern Newfoundland were less likely to report consistent discipline compared with respondents from Labrador (OR 0.6, 95%CI 0.6-0.7; 1628/4844 Eastern Newfoundland versus 743/1702 Labrador). Respondents from intact households were more likely to report they were consistently disciplined for not following established rules compared with respondents from non-intact families (OR 1.4, 95%CI 1.2-1.6; 1951/5183 respondents from intact households versus 405/1313 respondents from non-intact households).

#### **4.7.4.1 Discipline and smoking**

Some 20% (480/2359) of youth who reported that they consistently disciplined for not following established rules smoked compared with 32% ( 1339/4156) of youth who reported they were seldom disciplined when they broke rules (OR 0.5, 95%CI 0.46-0.6).

Controlling for respondent drinking, respondent drug use, unsafe sexual practices, friend drinking, friend drug use, household intactness, parental knowledge of whereabouts and consistent rule setting through stratification did not explain the protective association between smoking and consistent discipline

#### **4.7.4.2 Discipline and drinking**

Some 23% ( 541/2354) of youth who were consistently disciplined by parents drank regularly in the last six months compared with 35% ( (1431/4151) of youth who were not disciplined (OR 0.6, 95%CI 0.5-0.6). Consistent discipline was less protective against drinking in Eastern Newfoundland (OR 0.7, 95%CI 0.6-0.8; 418/1616 respondents receiving consistent discipline versus 1113/3198 respondents not receiving consistent discipline) compared with Labrador (OR 0.4, 95%CI 0.3-0.5; 123/738 respondents receiving consistent discipline versus 318/953 respondents not receiving consistent discipline).

The protectiveness of consistent discipline against drinking varied between the age groups. Among respondents aged sixteen and over, respondents reporting consistent parental discipline were only half as likely to drink compared with respondents reporting they were not disciplined consistently when they did not follow established rules (OR 0.5, 95%CI 0.4-0.6; 234/714 respondents receiving consistent discipline versus 858/1768 respondents not receiving consistent discipline ). Controlling for respondent smoking, respondent drug use, friend drinking, friend drug use, family intactness, parental knowledge of whereabouts and consistent parental rule setting did not explain the protective association between consistent parental discipline and

drinking in this age group. Among respondents under the age of sixteen, the protective association between drinking and consistent parental discipline can be explained by parental knowledge and rule setting and by other risk behaviours (smoking and/or drug use).

#### **4.7.4.3 Discipline and drug use**

Some 21% ( 492/2362) of youth who were consistently disciplined by parents used drugs in the last six months compared with 31% ( (1282/4152) of youth who were not consistently disciplined (OR 0.6, 95%CI 0.5-0.7). Controlling for respondent sex, respondent age, area of residence, respondent drinking, respondent smoking, family intactness, parental knowledge of whereabouts and parental rule setting through sequential stratification did not explain the protective association between consistent parental discipline and drug use.

#### **4.7.4.4 Discipline and unsafe sex**

Some 11% ( 250/2312)) of youth who were consistently disciplined by parents had unsafe sex in the last six months compared with 19% ( (773/4042) of youth who were not disciplined (OR 0.5, 95%CI 0.4-0.6). Controlling for the respondent sex, respondent age, area of residence, respondent drinking, respondent smoking, respondent drug use, friend drinking, friend drug use, family intactness, parental knowledge of whereabouts and parental rule setting through sequential stratification did not explain the protective association between consistent parental discipline and unsafe sex.

#### **4.7.5 Group membership**

Some 51% (3346/6516) of respondents reported belonging to a group (Table 28). Females were more likely than males to report belonging to a group (OR 1.3, 95%CI 1.2-1.5; 1806/3300 females versus 1535/3207 males). In Labrador both age groups were equally likely to belong to a group outside of school. In Eastern Newfoundland, those under the age of sixteen were twice as likely as older respondents to belong to a group (OR 2.0, 95%CI 1.8-2.3; 1583/2928 respondents under the age of sixteen versus 691/1872 respondents aged sixteen and older).

##### **4.7.5.1 Group membership and smoking**

Some 20% ( 672/3331) of youth who belonged to a group reported smoking everyday compared with 37% ( 1152/3154) of youth who were not group members. Group membership was more protective against smoking among females (OR 0.4, 95%CI 0.4-0.5; 324/1802 respondents who were group members versus 535/1488 respondents who were not group members) compared with males (OR 0.5, 95%CI 0.4-0.6; 348/1524 respondents who were group members versus 615/1662 respondents who were not group members). Group membership was less protective against smoking among those who used drugs in the last six months (OR 0.6, 95%CI 0.5-0.8; 415/699 respondents who were group members versus 738/1067 respondents who were not group members) than among non-drug users (OR 0.4, 95%CI 0.4-0.5; 254/2618 respondents who were group members versus 413/2074 respondents who were not group members).

Group membership was more protective against smoking among those reporting consistent parental knowledge of whereabouts (OR 0.4, 95%CI 0.35-0.5; 304/2225 respondents who were

group members versus 464/1685 respondents who were not group members) compared with those who reported limited parental knowledge of whereabouts (OR 0.6 95%CI 0.5-0.7; (363/1086 respondents who were group members versus 682/1451 respondents who were not group members). Controlling for respondent's age, respondent drinking, friend drinking, friend drug use, family intactness, parental rules setting and parental discipline did not impact the protective association between group membership and smoking.

#### **4.7.5.2 Group membership and drinking**

Some 24% ( 811/3326) of youth who belonged to a group reported drinking regularly in the last six months compared with 37% ( 1157/3153) of youth who were not group members (OR 0.6, 95%CI 0.5-0.6).

Group membership was more protective against drinking among those reporting few drinking friends (OR 0.4, 95%CI 0.3-0.6; 74/1627 respondents who were group members versus 112/1155 respondents who were not group members) compared with those reporting many friends who drank (OR 0.7, 95%CI 0.6 0.8; 737/1690 respondents who were group members versus 1044/1992 respondents who were not group members) and was only protective against drinking among those who had not used drugs in the last six months (OR 0.6, 95%CI 0.5-0.7, 345/2615 respondents who were group members versus 407/2075 respondents who were not group members). Controlling for respondent sex, age, area of residence, respondent smoking, friend drug use, family intactness, parental knowledge of whereabouts, parental rule setting and parental discipline did not explain the protective association between group membership and drinking.

#### **4.7.5.3 Group membership and drug use**

Some 21% ( 700/3330) of youth who belonged to a group reported drug use in the last six months compared with 34% ( 1070/3156) of youth who were not group members (OR 0.5, 95%CI 0.4-0.6). Group membership was less protective against drug use among those who drank regularly in the last six months (OR 0.7, 95%CI 0.6-0.9; 463/808 respondents who were group members versus 749/1156 respondents who were not group members) compared with those who did not drink (OR 0.6, 95%CI 0.5-0.7; 235/2505 respondents who were group members versus 316/1984 respondents who were not group members) and was only protective against drug use among those who did not smoke (OR 0.6, 95%CI 0.5-0.7; 284/2648 respondents who were group members versus 329/1990 respondents who were not group members). Controlling for respondents sex, respondents age, area of residence, friend drinking, friend drug use, family intactness, parental knowledge, parental rule setting and parental discipline did not explain the protective association between group membership and drug use.

#### **4.7.5.4 Group membership and unsafe sex**

Some 11% ( 372/3257) of youth who belonged to a group reported having unsafe sex in the last six months compared with 21% ( 649/3059) of youth who were not group members (OR 0.5, 95%CI 0.4-0.6). The association between group membership and unsafe sex was more protective among females (OR 0.4, 95%CI 0.3-0.5; 209/1778 respondents who were group members versus 369/1460 respondents who were not group members) compared with males (OR 0.6, 95%CI 0.5-0.7; 163/1475 respondents who were group members versus 279/1595 respondents who were not group members). Controlling for respondents age, area of residence, respondent smoking,

respondent drinking, respondent drug use, peer drinking, peer drug use, family intactness, parental monitoring, rule setting and parental discipline did not explain the protective association between group membership and unsafe sexual activity.

#### **4.8 The combined effects of risk factors**

##### **4.8.1 Smoking (Table 29)**

I examined the combined effect of the protective and promotive risk factors on smoking in a logistic regression model. The absence of other risk behaviours (drinking, drug use and unprotected sex) remained strongly associated with an adolescent's decision not to smoke. A non-drinking adolescent was twice as likely not to smoke compared with an adolescent who drank (OR 2.0, 95%CI 1.7-2.4). A non-drug using adolescent was almost four times as likely not to smoke compared with an adolescent who used drugs (OR 3.7, 95%CI 3.2-4.4). An adolescent reporting no unsafe sex was twice as likely not to smoke compared with an adolescent reporting unsafe sex (OR 2.0, 95%CI 1.7-2.4).

Associating with non-drinking friends and non-drug using friends also protected against smoking. An adolescent having few drinking friends was 60% more likely not to smoke compared with an adolescent having many drinking friends (OR 1.6, 95%CI 1.3-1.9). An adolescent having few drug using friends was 60% more likely not to smoke compared with an adolescent having many drug using friends (OR 1.6, 95%CI 1.4-1.9).

Having no exposure to unwanted sex also protected against smoking. An adolescent who reported no forced sex was 70% more likely to also report that they did not smoke compared with an adolescent reporting forced sex (OR 1.7, 95%CI 1.4-2.1).

Family intactness, parental knowledge of whereabouts, consistent parental discipline and group membership all retained their protective associations against smoking in the final regression model. An adolescent from an intact household was 60% more likely not to smoke compared with an adolescents from a non-intact household (OR 1.6, 95%CI 1.4-1.9). An adolescent reporting his/her parents usually knew his/her whereabouts was 40% more likely not to smoke compared with an adolescent whose parents seldom knew where they were (OR 1.4, 95%CI 1.2-1.6). An adolescent whose parents disciplined consistently when rules were broken rules was 30% more likely not to smoke compared with an adolescent not disciplined consistently (OR 1.3, 95%CI 1.1-1.5). An adolescent who belonged to an organized group was 70% more likely not to smoke compared with an adolescent who was not a group member (OR 1.7, 95%CI 1.5-2.0).

#### **4.8.2 Drinking** (Table 30)

I examined the combined effect of the protective and promotive risk factors on drinking in a logistic regression model. The absence of other risk behaviours (smoking, drug use and unprotected sex) remained strongly associated with an adolescent's decision not to drink. A non-smoking adolescent was twice as likely not to drink compared with an adolescent who smoked (OR 1.9, 95%CI 1.6-2.3). An adolescent who did not use drugs was nearly four times as likely not to drink compared with an adolescent who used drugs (OR 3.6, 95%CI 3.0-4.2). An

adolescent reporting no unsafe sex was 50% more likely not to drink compared with an adolescent who reported unsafe sex (OR 1.5, 95%CI 1.2-1.8). I also found an association between unwanted sex and drinking. An adolescent who reported no forced sex was 30% more likely to also report that they did not drink compared with an adolescent reporting forced sex (OR 1.3, 95%CI 1.1-1.6).

Association with non-drinking friends was the factor offering the most protection against adolescent drinking. An adolescent with few drinking friends was almost six times as likely to not drink compared with an adolescent with many drinking friends (OR 5.7, 95%CI 4.8-6.9). An adolescent with few drug using friends was 40% more likely not to drink compared with an adolescent reporting many drug using friends (OR 1.4, 95%CI 1.2-1.7).

Parental knowledge of whereabouts and consistent parental discipline retained their protective associations against drinking in the final regression model. An adolescent reporting their parents usually knew their whereabouts was 60% more likely not to drink compared with an adolescent whose parents seldom knew their whereabouts (OR 1.6, 95%CI 1.4-1.9). An adolescent whose parents set rules consistently was 30% more likely not to drink compared with an adolescent whose parents did not set rules consistently (OR 1.3, 95%CI 1.1-1.5).

Age and sex also remained associated with drinking in the final logistic regression model. Younger adolescents were slightly more likely not to drink compared with adolescents aged

sixteen and older (OR 1.2, 95%CI 1.0-1.4). Males were 50% less likely than females to report that they did not drink after taking all factors into consideration (OR 0.5, 95%CI 0.5-0.6).

#### **4.8.3 Drug use** (Table 31)

I examined the combined effect of the protective and promotive risk factors on drug use in a logistic regression model. The absence of other risk behaviours (smoking, drinking and unprotected sex) remained strongly associated with an adolescent's decision not to use drugs. A non-smoking adolescent was nearly four times as likely not to use drugs than an adolescent who smoked (OR 3.6 95%CI 3.1-4.2). An adolescent who did not drink was over three times as likely not to use drugs than an adolescent who reported drinking (OR 3.3 95%CI 2.8-3.9). An adolescent who reported no unsafe sex was nearly twice as likely not to use drugs than an adolescent who reported unsafe sex (OR 1.8 95%CI 1.5-2.2).

Association with friend who did not use drugs was the factor offering the most protection against adolescent drug use. An adolescent with few drug using friends was almost six times as likely to not use drugs compared with an adolescent having many drug using friends (OR 5.7 95%CI 4.9-6.7). An adolescent with few drinking friends was nearly twice as likely not to use drugs compared with an adolescent reporting many drinking friends (OR 1.8 95%CI 1.5-2.2).

Family intactness and parental knowledge of whereabouts retained their protective associations against drug use in the final regression model. An adolescent from an intact household was 30% more likely not to use drugs compared with an adolescents from a non-intact household (OR 1.3

95%CI 1.1-1.6). An adolescent whose parents usually knew their whereabouts was 50% more likely not to use drugs than an adolescent less monitored (OR 1.5, 95%CI 1.3-1.8).

The respondents' sex also remained associated with drug use in the final logistic regression model. Males were 30% less likely than females to report that they had not used drugs in the last six months after taking all factors into consideration (OR 0.7, 95%CI 0.6-0.8).

#### **4.8.4 Unsafe sex (Table 32)**

I examined the combined effect of the protective and promotive risk factors on unsafe sex in a logistic regression model. The absence of other risk behaviours (smoking, drinking and drug use) remained strongly associated with an adolescent's decision not to have unsafe sex. A non-smoking adolescent was twice as likely not to have reported unsafe sex compared with an adolescent who smoked (OR 2.0, 95%CI 1.6-2.4). An adolescent who did not drink was 40% more likely not to have reported unsafe sex compared with an adolescent who reported drinking (OR 1.4, 95%CI 1.2-1.8). An adolescent who reported no drug use was 80% more likely not to have reported unsafe sex compared with an adolescent who used drugs (OR 1.8, 95%CI 1.5-2.3).

Peer substance use was associated with unsafe sex. An adolescent with few drug-using friends was 50% more likely not to have reported unsafe sex compared with an adolescent having many drug-using friends (OR 1.5, 95%CI 1.2-1.8). An adolescent with few drinking friends was 50% more likely not to have reported unsafe sex compared with an adolescent having many drinking friends (OR 1.5, 95%CI 1.2-2.0).

The age of the respondent and the respondents exposure to unwanted sex were the factors most strongly associated with unwanted sex in the final logistic regression model. An adolescent under the age of sixteen was over two times as likely not to report having unsafe sex compared with an adolescent aged sixteen or older (OR 2.5, 95%CI 2.1-3.0). An adolescent who did not experience any unwanted sex was twice as likely to have not had unsafe sex (OR 1.9, 95%CI 1.6-2.4). Males were 60% more likely to report no unsafe sexual activity compared with females (OR 1.6, 95%CI 1.3-1.9).

Family intactness, parental discipline and membership in a group retained their protective associations against unsafe sex in the final regression model. An adolescent from an intact household was 40% more likely not to have reported unsafe sex compared with an adolescents from a non-intact household (OR 1.4, 95%CI 1.1-1.7). An adolescent consistently discipline by parents was 30% more likely not to have reported unsafe sex compared with an adolescent receiving inconsistent discipline (OR 1.3, 95%CI 1.1-1.6). An adolescent who was a member of a group was 30% more likely not to have reported unsafe sex compared with an adolescent who was not a member of a group (OR 1.3, 95%CI 1.1-1.5).

## **5. Discussion**

### **5.1 Comparison of prevalence rates with existing studies**

Tyas and Pederson in their 1998 review of literature on adolescent smoking<sup>64</sup> noted the need for common definitions of risk behaviours and associated factors. I was able to compare several of the findings of this study with those of the Newfoundland and Labrador Student Drug Use Survey<sup>65</sup> conducted in 1998. It was not possible, however, to compare rates of drug use between studies because the 1998 Newfoundland and Labrador Student Drug Use Survey distinguished between marijuana and other drug use which I could not do in this combined data set.

In those cases where it was possible to make comparisons, the findings of this current study are similar to those of the 1998 study. In both studies, drinking was the most commonly reported risk behaviour. Some 58% of respondents in the Newfoundland and Labrador Student Drug Use Survey<sup>66</sup> reported “any” alcohol use (with “any” defined as any use within the last year) compared with the 56% in this study who reported that they drank (with drinking undefined and with no time frame applied).

In the 1998 Newfoundland and Labrador Student Drug Use Survey, some 36% of students reported frequent alcohol use (defined as more than once a month in the last twelve months) compared with 30% in this study who reported regular drinking (defined as more than once a month in the last 6 months). This decrease of 6% in “frequent/regular” alcohol use between the 1998 study and these combined studies may have resulted in part from the decreased time frame

used in the question about regular drinking (from twelve months in the 1998 study to six months in this study).

In both studies, smoking was the second most common risk behaviour. In the 1998 Newfoundland and Labrador Student Drug Use Survey, some 38% of respondents reported “any” smoking (with any smoking defined as one cigarette in the last year) compared with 40% reporting “any” smoking in this study (with smoking defined as any smoking, even if not every day, with no time frame).

In the 1998 study, some 21% reported regular smoking (defined as smoking at least one cigarette a day in the last 30 days). In this data set, 28% reported regular smoking (defined as smoking at least one cigarette per day without a time frame). This increase of 7% in “regular” smoking between the 1998 study and this combined study may have resulted in part from the different time frames used in the questions about smoking (30 days in the 1998 Newfoundland and Labrador Student Drug Use Survey compared with no time frame in this study).

## **5.2 Evidence of a risk behaviour syndrome**

The literature indicated that coincidental smoking, drinking and/or drug use among adolescents is characteristic of a risk behaviour syndrome (Jessor, 1991)<sup>67</sup>. In our regression models, the various risk behaviours (smoking, drinking and drug use) remained strongly associated with each other and with peer substance use. It was not possible to tell whether this clustering of risk behaviours was the result of experimentation only or if it signified more serious behavioural problems.

### **5.2.1 Multiple risk behaviours**

In this study, smokers were more likely to drink and use drugs compared with non-smokers, adolescents who drank were more likely to also smoke and use drugs compared with non-drinking adolescents and drug using adolescents were more likely to smoke and drink compared with adolescents who didn't use drugs. Only a quarter of those who smoked (22% - 401/1828) did not also drink and/or use drugs. A similarly small proportion of respondents reported only regular drinking, (25% - 489/1979) without drug use and/or smoking. Drug use was the risk behaviour that most seldom occurred without other accompanying risk behaviours. Only one in ten drug users did not also drink and/or smoke (13% - 238/1774).

I found all three of these risk behaviours to be associated with reports of unsafe sex. Tapert<sup>68</sup> et al reported similar results in a longitudinal study of self-reported sexual behaviours and substance use among youth in treatment programs and a comparison sample of socio-demographically similar community youths without histories of substance use. The substance abusing youth reported earlier sexual activity, more sexual partners, less consistent use of condoms, more sexually transmitted diseases (STDs), and greater prevalence of human immunodeficiency virus testing than did the comparable non-abusing community youth. Substance use continued to be associated with high-risk sexual behaviour throughout the transition into young adulthood.

Among this study population, it was possible that participation in unsafe sex resulted from substance use. Adolescents were not asked specifically about sexual behaviour while under the influence of alcohol or drugs so I can draw no conclusions about how substance use might affect

adolescent decision making about having unprotected sex. There was, however, a strong association between smoking (which would not hamper adolescent decision making) and unsafe sexual practices among non /occasional drinkers and non/occasional drug users (OR 5.7, 95%CI 4.3-7.7; 86/390 versus 166/3511) which supports the notion that the associations between unsafe sexual activity and substance abuse found in this data set may reflect an overall predilection for risk taking.

Exposure to forced sex was also associated with smoking, drinking and drug use in this study. Again it could not be determined from this data set whether substance use had put the adolescent at greater risk for unwanted sex or whether previous sexual assault had led to the reported substance abuse.

### **5.2.2 Association with like minded peers**

Steinberg<sup>69</sup> noted that most adolescent risk taking is a group phenomenon. Indeed, when asked about the last time they drank in the National Longitudinal Study of Adolescent Health Waves I and II<sup>70</sup>, only 25% of youth who drank reported that they were alone the last time they used alcohol.

In this study, adolescents were instead asked how many of their friends drank or used drugs. Having many (half or more) friends who drank was associated with regular smoking, drinking, drug use and unsafe sex. Having many (half or more) friends who used drugs was also associated with regular smoking, drinking, drug use and unsafe sex.

This study could not determine the causal direction of peer affiliation and risk taking. An increasing amount of literature suggests that adolescents choose their peers based on their own predilection for risk taking. Shedler and Block<sup>71</sup> suggested that problem substance use was a consequence of overall maladjustment, related to early childhood development and that by adolescence, youth were actively selecting and forging the circumstance and peer relationships that suited them. Consequently choosing substance using peers was merely an indication that the child already intended to use substances. Based on a behaviour willingness model, Gerrard et al<sup>72</sup> stated that risk behaviours were unplanned, had a social context and that adolescents would indulge in those behaviours that promoted the reputation she/he found acceptable. Brown et al<sup>73</sup> stated that peer affiliation was not a matter of chance association but a function of the reputation one established among peers by virtue of one's background and behaviour. In other words it was the existing behaviour that established the peer group and the choice of peer group was the method by which an adolescent promoted the attitudes and behaviours they found desirable.

This cross sectional study could not examine the dysfunctional family and life conditions believed to precede an adolescent's association with risk taking peers or his/her involvement in clustered risk behaviours and it could not identify when the risk behaviour has gone beyond experimentation to something more serious.

### **5.2.3 The role of age in a risk behaviour syndrome**

Although the prevalence rates of smoking, drinking and drug use were higher among older adolescents (aged sixteen and older), the associations between the individual risk behaviours

(smoking and drinking, smoking and drug use, drinking and drug use) were stronger among younger respondents. The early clustering of risk behaviours was evident when I examined the age of initial use. Some 84% (258/308) of those who initiated drug use by the age of 12 had also initiated drinking by that age. Some 91%(280/307) of these early drug users had also initiated smoking by the age of twelve. In fact, some 71% of early drug users (221/308) initiated all three behaviours before the age of twelve. It was not possible to determine whether “gateway” behaviours such as smoking led to the initiation of drinking and drug use.

Although a larger proportion of older adolescents reported having many drinking friends compared with younger adolescents, the association between drinking and having many friends who drank was stronger among the younger age group. The problem behaviour theory of Jessor and colleagues<sup>74</sup> explains group risk taking among younger adolescents in terms of the societal norms associated with age appropriate behaviour. For example, drinking among older adolescent may be permitted or at least tolerated but is considered much more condemnable among those who are younger. Drinking, or being intoxicated in early adolescence is considered more deviant than it is for adolescents who are closer to legal drinking age. Perhaps because society is more accepting of drinking in older adolescents, older youth do not need the level of peer support that younger adolescents need in order to drink.

In this study, access to alcohol among the older age group was not as peer dependent as it was among the younger age groups. The research teams in both Eastern Newfoundland and Labrador asked respondents where they got their alcohol. Although the question was not considered

comparable between the regions because of differences in wording and was excluded from analysis in this study, the regional responses indicate that youth aged sixteen and over have different modes of access to alcohol than those under the age of sixteen. In Newfoundland some 25% (375/1513) of those aged sixteen and over bought alcohol themselves while only 9% (133/1549) of those under sixteen reported doing so (OR 3.5, 95%CI 2.8-4.8). Only 23% (350/1513) of those aged sixteen and over relied on peers as a source of alcohol compared with 37% (574/1549) of those under the age of sixteen (OR 0.5, 95%CI 0.4-0.6). A similar situation occurred in Labrador where 7% (24/342) of those under the age of sixteen reported buying their own alcohol compared with 22% (95/426) of those aged sixteen and over (OR 0.3, 95%CI 0.2-0.4). Only 29% (121/426) of those aged sixteen and over relied on a peer to supply alcohol compared with 36% (122/342) of those under the age of sixteen (OR 0.7, 95%CI 0.5-1.0).

The relationship between drug use and having many friends who used drugs was also stronger among the younger age group. It may be that among the younger adolescents in this study, peer drug use was an important facilitating factor in the mechanism that led to experimentation with drugs. The decreased association between drug use and drug using peers among the older age group, while still strong, might indicate that older adolescents who want to use drugs have developed non-peer related mechanisms that support this activity (for example, increased exposure to different types of drugs and more diverse methods of obtaining drugs).

I was able to examine the idea that older adolescents have, if not more, certainly different access/exposure to a wider variety of drugs than do younger adolescents by looking exclusively at

the Labrador data set, where questions about drug use differentiated between “soft” drugs (such as pot), “hard” drugs (such as crack or heroin) and “ non-prescribed” drugs (such as steroids). I found in the Labrador data set that an older adolescent who reported using marijuana was twice as likely to report also using a hard drug compared with a marijuana using adolescent in the younger age group (OR 2.0, 95%CI 1.4-2.9 143/333 respondents who used marijuana versus 74/275 respondents who did not use marijuana).

While drug use among older adolescents might not receive the increased social acceptance that drinking would, drug use among the older age group would still likely be viewed as “less deviant” than it would be among the younger age group. An adolescent in this older age group might be less reliant on peers should he/she chose to use drugs whereas younger adolescents wishing to use drugs might require a peer group that supported this behaviour and facilitated access to the substances themselves or places in which to use them.

In his 2004 article appearing in the Annals of the New York Academy of Sciences, Steinberg<sup>75</sup> shed light on why younger adolescents may be more prone to risk taking. He stated that early adolescence was a vulnerable time for risk taking because novelty and sensation seeking both increased dramatically at puberty while the development of self-regulatory competence did not occur until a later age, not fully maturing until early adulthood. Steinberg went on to suggest that this mis-timing was biological, not unusual and unlikely to be changed through educational interventions designed to change adolescent perception, evaluation or understanding of risk. He

felt that youth risk taking did not occur because younger adolescents were not cognitively able to appraise the riskiness of activities such as drinking or drug use.

Based on his own former studies, Steinberg stated that adolescents as young as 14 perceived the same amount of risk in an activity such as drinking and driving as did an adult ten years older. Furthermore, by the time an adolescent reached 16, he or she could reason most hypothetical situations as well as adults. Consequently, Steinberg thought that age differences in risk taking were due to phenomena other than ability to perceive and appraise risk. Steinberg felt the incongruity between heightened sensation seeking and an immature self-regulatory system that was not yet able to modulate reward seeking impulses led to risk taking. What distinguished adolescents from young adults was not the fact that adolescents were less knowledgeable about what was and wasn't risky but that adolescents had a higher need for the sort of stimulation that risk taking provided without the mitigating self-regulatory abilities that surfaced as the adolescent aged.

This study did not assess the ability of adolescents to evaluate the risk associated with behaviours such as smoking, drinking, drug use and unsafe sex nor the effect this risk assessment capability might have had on adolescent risk taking.

## **5.3 Factors that protect against risk taking**

### **5.3.1 Family Intactness**

In the logistic regression models (Table 33) family intactness protected against smoking, drug use and having unprotected sex after taking into account other risk behaviours, peer risk taking and parental knowledge about adolescent whereabouts, rule setting and discipline. This was in line with the findings of Norton and Lindrooth<sup>76</sup> who found that among grade 6-9 students, living in a single parent home was the strongest predictor for adolescent smoking and drinking and Steinberg<sup>77</sup> who found that children from parent-step parent homes were equally at risk as those from single parent homes.

Living with both biological parents (an intact family) may be protective for several reasons.

Adolescents from one parent or reconstituted families may be adversely affected by the divorce or separation of their parents. Parental divorce is known to increase risk behaviours in youth<sup>78</sup> and is associated with psycho-social upheaval that might lead to risk taking. Vicary and Lerner found that the parents of adolescents who used substances were more likely to have experienced marital conflict when their children were young<sup>79</sup>. Increased substance use among adolescents from single parent or reconstituted families in this study was congruent with Patterson's<sup>80</sup> development model for deviant behaviour, the theories of Shedler and Block<sup>81</sup> wherein early familial dysfunction (such as marital discord) negatively impacted future adolescent risk behaviour and Jessor's<sup>82</sup> problem behaviour theory which hypothesized that the breakdown of the original family unit weakened one of the conventional bonds (to society, families, schools and religion) that compelled individuals to adhere to conventional standards of behaviour.

It may be that biological parents in an intact household are both equally motivated to remain consistently aware of their children actions leading to more diligent monitoring activities than would be the case in single parent/reconstituted households. Also, it may be easier for two biological parents to unite in their efforts to control adolescent behaviour through setting and enforcing rules than it would be for parents within a reconstituted household. The findings in this study support this. Adolescents from two parent families were more likely to report their parents always or usually knew their whereabouts (OR 1.5, 95%CI 1.3-1.7; 3258/5198 versus 702/1316), always or usually set rules for them to follow (OR 1.7, 95%CI 1.5-1.9; 3550/5193 versus 736/1316) and always or usually punished them when rules were not followed (OR 1.4, 95%CI 1.2-1.6; 1951/5183 versus 405/1313) compared with adolescents reporting different family configurations.

### **5.3.2 Parenting style**

Literature, previously described in this paper, identified authoritative parenting as the style most likely to produce well rounded, socially skilled adolescents while limiting risky behaviour. Parents achieve this through a combination of high support (responsiveness) and high control (demandingness). Demandingness was the characteristic believed to be the most effective in curbing current risk taking in adolescents. Parental “monitoring” was considered a very effective component of demandingness in which the parent actively tracked and knew where their children were, with whom and what they were doing.

More recently, literature<sup>34</sup> has indicated that widely used monitoring scales were in fact measurements of parental knowledge (what parents knew about their child's activities) rather than parental methods of obtaining that knowledge (monitoring activities). With the redefining of what had been considered parental monitoring (an activity) to parental knowledge (an outcome), responsiveness and demandingness became equally important in curbing current risk taking.

Parental knowledge (what parents know about their adolescents activities outside the home) can be obtained from several sources; child disclosure, parental solicitation and/or parental control. Of these sources, child disclosure has been associated with reduced norm breaking among adolescents while, in many cases, parental solicitation appeared to be associated with increased norm breaking. A non-responsive parenting style (authoritarian or neglectful) is less likely to support the close parent child relationships and communication that lead to adolescent disclosure.

Parenting style and its effect on adolescent behaviour is a complex concept which could not be fully addressed within this study. It was not possible to identify the causal relationship between parenting style and child disclosure (the source of parental knowledge associated with reduced norm breaking). Rather than preventing risk taking by promoting adolescent disclosure, it is possible that good parenting leads to well adjusted children who disclose more freely because they have little to hide from their parents. However, our data does support the importance of both parental knowledge and control (rule setting and discipline) in protecting youth from risk.

### 5.3.2.1 Parental knowledge

In our logistic regression models, parental knowledge protected against smoking, drinking and drug use (Table 33) after taking into account other risk behaviours, peer risk taking, family intactness, rule setting and discipline.

The measurement of parental knowledge in this combined data set differs from previously validated scales<sup>8384</sup> intended to measure parental knowledge. The respondents were asked a general question to ascertain whether their parents knew either where they were (in Eastern Newfoundland) or who they were with (Labrador) when not at home. Respondents were not asked specifically what parents knew about youth activities at different times of the day (after school versus evening) or week (weekend night versus school night). If not specifically asked to consider after school time in their answers, respondents might not view after school time the same as they would evenings or weekends in terms of parents knowing their whereabouts and their responses that parents always or usually knew their whereabouts might thus be over stated.

Literature illustrates the added value of treating parental knowledge of after school activities and evening activities separately. Flannery et al<sup>85</sup> found that those adolescents spending unsupervised time after school with peers reported higher levels of substance use and susceptibility to peer pressure compared with those who were with parents, in group activities or home by themselves with no peer contact. In a cross sectional study of 2034 urban adolescents of different ethnic backgrounds, Cohen et al<sup>86</sup> found that 56% of students reported being home for four or more hours after school without adult supervision. More than half of sexually active youths within this

study reported that they had sex at home after school, and, particularly for boys, sexual-and drug-related risks increased as the amount of unsupervised time increased. A more detailed measurement of parental knowledge about how youth spend their time in this study might have exposed an association between unsafe sex and parental knowledge; the only one of the four risk behaviours examined with which parental knowledge did not have a protective association in the final regression model.

Brown et al<sup>82</sup> asked youth what their parents knew about their spending habits which is a component of parental knowledge not considered in this combined study; however, the relationship between parenting, youth spending and youth risk taking can be examined in general terms by looking at the Labrador data set.

In the Labrador study, youth were asked how much money they had to spend on themselves each week. Those respondents reporting that their parents always or usually know their whereabouts were less likely to have more than \$25 to spend on themselves weekly compared with respondents reporting that their parents seldom or never knew their whereabouts (OR 0.6, 95%CI 0.4-0.7; 366/1098 versus 284/595). Those respondents having *less* than \$25 per week to spend on themselves were less likely to report regular drinking (OR 0.3, 95%CI 0.24-0.4; 178/1046 versus 266/651), smoking (OR 0.4, 95%CI 0.3-0.5; 196/1048 versus 233/653) and using drugs (OR 0.3, 95%CI 0.2-0.4; 111/1052 versus 186/651) compared with those respondents having *more* than \$25.00 to spend per week.

### **5.3.2.2 Parental control**

As stated earlier, parental control is the method by which parents attempt to gain information and remain knowledgeable about their children's lives by imposing rules and restrictions on their child's activities and associations reducing the freedom their child has to do things without telling them.

#### **Rule setting**

It seems reasonable that rules that can be ignored or broken without consequence would be less restrictive than would rules which guarantee punishment if not followed. For this reason, we might expect to see rule setting unaccompanied by consistent discipline to be less protective than rule setting where discipline is guaranteed. However, the protective association between rules setting and each of the four risk behaviours (smoking, drinking, drug use and unsafe sex) did not change when I used stratification to control for the effect of discipline.

This might indicate that rule setting contributes more to adolescent resilience beyond providing a limit beyond which the adolescent is not to venture. Literature suggests that the rule setting process itself promotes adolescent resilience through communication and negotiation with parents. In her study that examined the rule setting styles of Authoritarian and Authoritative parents, J.Smetana<sup>87</sup> found it was the adolescence/adult interaction during the establishment of rules that differentiated authoritative and authoritarian parenting styles. While the liberty given to adolescents to establish their own rules did not vary greatly between authoritative and authoritarian parents, the authoritative parent was more consistent in establishing rules and, more

importantly, consistently explained the rationale behind the rule; unlike the authoritative parent whose rule making was often subjective and non-explanatory. While both can be considered protective against adolescent risk taking, the authoritarian parent's (highly demanding with a low level of responsiveness) rule setting is often arbitrary and coercive while the authoritative style (highly demanding and highly responsive) fosters adolescent responsibility, decision making and independence.

In the final logistic regression models for smoking, drinking, drug use and unsafe sex where all protective and facilitating variables are taken into account, rule setting remained protective only against drinking (Table 33). This may result from limited probing of "consistent parental rule setting" in the original regional surveys from which this combined data set resulted. The regional research teams measured the adolescents' perception of the existence and consistency of parental rule setting; but did not probe the process involved in establishing rules (the amount of input from adolescents about the rules and the areas left to the discretion of the adolescent) which may be as protective against adolescent risk taking as the existence of the rules themselves.

Consequently, this study based on the combined data set could not identify the characteristics that differentiate between arbitrary and co-operative rule setting, perhaps masking the true protective effect of consistent rule setting against each of the risk behaviours.

## **Discipline**

In the final logistic regression models for smoking, drinking, drug use and unsafe sex where all protective and facilitating variables are taken into account, consistent parental discipline remained protective against smoking and unsafe sex (Table 33).

In the two individual studies that were combined for this study, the regional research teams asked respondents about the consistency of parental discipline but not about the severity or appropriateness of the discipline. The developmental model of Patterson et al<sup>6</sup> points out that harsh discipline, including threats of physical violence, leads to aggressive and then deviant behaviour. It was impossible to tell from this study whether or not the “consistent” discipline reported was also “appropriate” non-coercive discipline.

With the above limitations noted, the findings of this study were consistent with those of previous studies described in the literature review. Risk taking (smoking, drinking, drug use and unsafe sex) occurred less among those who perceived that their parents usually knew their whereabouts<sup>31 32 31 33</sup>, set rules<sup>36</sup> and punished consistently<sup>30</sup>. Parental knowledge and control (rule setting and discipline) remained protective when controlling for family intactness and for each other through sequential stratification.

The nature of the relationship between parental knowledge and control (rule setting and discipline) and reduced risk taking among adolescents in this data set remains unclear. Whether knowledge, rule setting and discipline are in themselves responsible in whole or in part for the

adolescents refraining from risk taking or whether they only reinforce a prior decision by the adolescents to refrain from risk taking cannot be ascertained from this study. It is only possible to say, that in this data set, parental knowledge, consistent rule setting and consistent discipline were all associated with reduced risk taking.

### **5.4.3 Group membership**

In our initial sequential stratified analysis, group membership protected against smoking, drinking, drug use and unsafe sex. The protectiveness of group membership could not be explained by family intactness, parental knowledge of adolescent activities, parental rule setting or discipline. In the final logistic regression models for smoking, drinking, drug use and unsafe sex where all protective and facilitating variables are taken into account, group membership remained protective against smoking and unsafe sex.

One of the factors that may explain the protectiveness of group membership is that such activities might occur immediately after school which, as mentioned earlier, is a time that adolescents are left on their own more so than in the evening. Flannery et al<sup>88</sup> in a study of 1170 early adolescents found that those who spent unsupervised time with peers after school reported higher levels of aggression, delinquency, substance use and susceptibility to peer pressure compared with adolescents at home with parents, other adults or in supervised activities. The protective association between group membership and smoking might also be explained by the nature of the group. Membership in a sports oriented group might lead to decreased smoking to enhance performance.

Group membership as a deterrent to risk taking differs from parental monitoring, rule setting or punishment, in that it offers an alternate opportunity to socialize - a form of protectiveness less oppressive than parental monitoring and more conducive to social skill building. I was able, within the Labrador data, to examine the relationship between self-esteem and group membership. Respondents within Labrador belonging to a group were less likely to have low self-esteem compared with respondents who were not members of a group. Group membership was more protective against low self-esteem among females (OR 0.4, 95%CI 0.3-0.5; 230/534 versus 195/288) compared with males (OR 0.6, 95%CI 0.5-0.8; 154/476 versus 139/315). Similarly, respondents in Labrador belonging to a group were less likely to have a low sense of mastery compared with respondents not belonging to a group and again, this protective association was stronger among females (OR 0.3, 95%CI 0.2-0.4; 186/542 versus 182/291) compared with males (OR 0.6, 95%CI 0.5-0.8; 170/469 versus 153/318).

While this supports the notion that group membership fosters a variety of social skills that facilitate healthy decisioning among adolescents, it is equally plausible that those individuals with low esteem and a low sense of mastery could be avoiding group activities leading to false conclusions about the benefits of group membership.

## **5.4 Study limitations**

### **5.4.1 Self-reporting**

The data used to measure risk behaviours in this study were self-reported. Whenever self-reporting is employed, there is the question of whether perceptions or recall are accurate and

congruent with reality and when the questions asked are about punishable behaviours, anonymity may not adequately compensate for the personal danger perceived in answering truthfully. However, anonymity does provide the best possible assurance of accuracy in self-reported behaviours.

### **5.4.2 Sampling**

With the exception of one community in Labrador where school attendance rates were close to 50%, the survey was applied to only the children in school on day of the survey. School drop outs and absentees were not included. Both of these groups would differ from those in school on the day of the survey. Sampling was also affected by self-selection (decision not to participate or not fill in certain questions) when the topic was a punishable one. Those more likely to opt out of answering certain or all questions may be those most at risk.

### **5.4.3 Accuracy of respondent perceptions**

#### **5.4.3.1 Adolescent perceptions about parenting**

Parents' perceptions of their parenting skills seldom concur with adolescents' perceptions<sup>89</sup>. It can be argued that it is the perception of adolescents about their parents more than the reality that affects their behaviour. If an adolescent feels that his/her parents are monitoring him/her then that is what actually affects his behaviour whether or not the actual parental monitoring is judged by the parent to be greater or less than what is perceived by the adolescent. However, the accurate measurement and description of parenting methods becomes important when any decision is made to enhance through training those parenting skills that are protective.

#### **5.4.3.2 Perceptions about peer substance use**

Adolescent perception of peer substance abuse may be different from the substance use reported by those same peers. Adolescents may be projecting their own usage onto their peers while actual peer usage might be quite different if measured. This variance between perceived and actual usage may impact the accuracy of associations between respondent substance use and peer substance use. In this study, respondents were not asked about the severity of peer substance use, only about the number of friends who used; however, it was still possible for respondents to incorrectly assess the proportion of their friends who used.

#### **5.4.4 Incomplete psycho social information**

The combined data set was missing information on many of psycho-social factors, both protective and risk promoting, that impact risk behaviour; such as the level of stress in the adolescent's life, his/her sense of mastery, level of self-esteem and the availability of emotional support. Consequently, these factors related to each other and how their combined influence ultimately affected risk behaviour is not known. Information about adolescents' stress, mastery, self-esteem and level of emotional support was gathered in both surveys but not in a compatible format.

#### **5.4.5 The absence of socioeconomic information**

A complete examination of adolescent risk behaviour and its influencing factors would include household socioeconomic factors such as household income and the education and employment status of parents. Given the different structure of the two surveys, data pertaining to parental

education and employment status were not available from both survey areas. Steinberg et al<sup>90</sup> did find; however, that sociol-economic factors were poor indicators of the crowd youth would associate with and that family intactness and ethnicity were more important.

#### **5.4.6 Absence of information about family support**

The protectiveness of responsive parenting could not be measured in this study because questions about parental communication and feeling loved by parents differed between the two survey areas. However, this omission does not preclude our drawing conclusions about the impact of parental demandingness on adolescent risk behaviours since other studies<sup>18 27</sup> have indicated that the protective impact of high demandingness on adolescent risk behaviour is independent of parental responsiveness (support). Nonetheless, parental responsiveness cannot be overlooked in an examination of youth risk taking as it is parental responsiveness<sup>27</sup> that is associated with higher levels of social competence and confidence, less internalized stress and higher self-esteem all of which impact adolescent decisions about risk taking; particularly when risk taking moves beyond the experimental stage.

More recently, literature<sup>34</sup> has linked parental responsiveness with good parent child communication which is believed to enhance parental knowledge of child activity through voluntary child disclosure; further highlighting the advantage of a highly responsiveness/highly demanding parenting style.

#### **5.4.7 Absence of information about the impact of parental modelling**

The impact of parental modelling (the adolescent imitating the behaviour of the parent) was not represented in this data set but merits examination for two reasons. Firstly, while not a dimension of parenting style, the smoking, drinking and drug using habits of the parent can directly impact the behaviour of the adolescent. Secondly, it is impossible to tell from this study how the actions of the parent, in terms of substance use, might undermine or enhance, if at all, the protectiveness of parental monitoring, rule setting, discipline and family intactness.

## **6. Recommendations**

Lawrence Steinberg<sup>91</sup> felt that risk taking occurred because of phenomena other than an adolescent's inability to assess the risk associated with certain activities. He felt that adolescents as young as fourteen already perceived the same amount of risk in an activity such as drinking and driving as adults ten years older and that by the age of sixteen, adolescents could reason most hypothetical risk situations as well as adults. What Steinberg felt distinguished adolescents from young adults was that adolescents had a higher need for the sort of stimulation that risk taking provided without the mitigating self-regulatory abilities that developed as the adolescent aged. Steinberg went on to suggest that this mis-timing was biological and unlikely to be changed through educational interventions designed to change adolescent perception, evaluation or understanding of risk.

The inevitability of youth risk does not mean that it cannot be addressed. Primary interventions aimed at educating youth may prevent some adolescents from ever taking risks. Other community based interventions may protect those current risk takers not swayed by educational efforts. Still other interventions can strengthen family interactions and parenting skills that either limit risk-taking or limit the circumstances under which it can occur.

### **6.1 Recommendations for educators**

#### **6.1.1 Continue primary interventions through education**

It has been well established that school-based prevention programmes can result in significant increases in knowledge about substances and in improved attitudes towards substance use even

though the impact of most education based interventions on substance use are relatively small. The DARE (Drug Abuse Resistance Education) program was one of the most widely used drug prevention programmes in the United States and is an example of one such program that was widely implemented but had little effect on substance abuse<sup>92 93</sup>.

Another multi component drug prevention programme called “The Healthy School and Drugs”<sup>94</sup> was widely disseminated in Dutch schools in the 1990's, reaching an estimated 350,000 adolescents. This programme was extensive, incorporating knowledge about substance abuse, attitude and behaviour along with skills training in making choices, refusal skills and increasing self-esteem. Materials were developed to support teachers in their work, including manuals for all series of lessons, video tapes, age specific exercises, and brochures for students. The programme also formed a multi-stakeholder co-ordinating committee expanding participation to the outside community, drawing on law enforcement and health officials and involving a parent representative. Again, knowledge about substances increased but the programme was less successful in changing attitudes about substance abuse and reducing actual rates of substance use. It may be that even the attitudinal changes reported when the program was evaluated resulted because the adolescent “knew” what attitude was expected of him after participating in the Healthy School and Drug programme.

Although I cannot comment on the type of information available to survey participants prior to these regional surveys or its efficacy in actually reducing risky behaviours, the risk taking adolescents who participated in the Eastern Newfoundland and Labrador studies did appear to be

knowledgeable about but not much influenced by the potential health consequences of their risk-taking. When respondents in Eastern Newfoundland who currently smoked were asked what would encourage them or someone their age to stop smoking; they appeared to be aware of the health consequences associated with smoking. Some 58% (798/1393) said health consequences might prompt them to quit. Even more telling, another 20% (275/1393) said they might be prompted to quit to be in better shape.

When respondents in Eastern Newfoundland who currently drank were asked what would encourage them or someone their age to stop drinking; again, they appeared to be aware that there were health consequences associated with drinking. Some 31% (483/1528) said health consequences might prompt them to quit. Another 17% (266/1528) said accidents and 10% (156/1528) said hearing real life stories might convince them or others to stop drinking.

Similarly, 21%(278/1302) of current drug users in Eastern Newfoundland reported health reasons would prompt them to stop using drugs. Another 25%(319/1302) said an accident or an overdose and 17%(230/1302) said problems with the police might encourage them and others to stop using drugs. Again, this seems to indicate that adolescents are aware of the consequences, health and otherwise, of these activities. Particularly troubling is the thought that an accident, an overdose or a problem with police would have to occur to make the risk tangible enough to avoid.

### **6.1.2 Make the message meaningful for adolescent audiences**

The comments of focus group participants in Labrador may best describe what would possibly impact adolescent attitudes and more importantly actions. First, students said messages that “told them what to do” would not work and neither would telling them that something “was bad for them”. This might be particularly ineffectual with an age group beginning to experience separation of self from family and entering a heightened period of sensation seeking. Secondly, students said that the messages must be something they could relate to. Focus group participants said, among other things, that “ads (with anti-drug messages) were cheesy” and “used only the ‘right’ people”, not realistic ones. Several ads being shown at the time were singled out for being “dumb” or “stupid”. Presenters of anti-drug messages who were perceived as real and experienced (either as a former user or law enforcement official) were more highly regarded.

From these focus group comments and from the responses given to survey questions asking what would make them stop using drugs or alcohol, one might conclude that the participants felt well informed about drugs (including alcohol) and that they made a clear distinction between the physiological dangers of drug use (overdose, loss of control, sickness) and the potentially dangerous but external outcomes of drug use (car accidents, snowmobile accidents, death by exposure). One can speculate about which has more impact on adolescent decisioning; but the fact is, both types of danger remained distant and unlikely; perceptions that may be very difficult to change.

Future educational endeavours may be more successful if they make the consequences of risk taking more conceivable or immediate. Ill health from smoking, drinking or drug use does not seem particularly relevant to adolescents perhaps because tobacco and alcohol related illnesses tend to occur much later in life. Accidents and overdoses may be more relevant to youth but the threat of them alone seems not enough to deter current usage.

### **6.1.3 Educational interventions and unsafe sex**

Protecting adolescents from the harm associated with unsafe sex differs from other risk behaviours in that a relatively effective intervention exists; however the promotion of condom use faces its own unique set of deterrents; often viewed unfavourably by parents and other influential groups. It should be noted that communities in Labrador, where the youth focus groups took place, are isolated and self contained and going to the only drug store in the community to buy condoms was not perceived as an easy undertaking by the focus group participants. Obtaining condoms to practice safe sex was perceived by these adolescents as something for which they would be punished and just as likely to cause parental anger as underage drinking. Condoning adolescent condom use carries with it the stigma of “condoning” adolescent sex; a connection with which many parents/educators and other adult gatekeepers might not be comfortable.

Unsafe sex also differs from the other risk behaviours in that its consequences can be more immediate (unlike tobacco related outcomes). Respondents suggested that hearing about the experiences of a single teenage mother would bring home to them the implications of unprotected

sex. Other respondents suggested that having someone young who was HIV positive tell their story would be effective in promoting safe sex but again, it seems, that the more similarities the story teller shares with the audience and the more familiar the circumstances surrounding the life altering “risk event”, the more relevant their story will be. For example, it may be less of a deterrent for unsafe sex if adolescents hear about the devastation of HIV infection from someone who became infected through a blood transfusion rather than through unprotected sex. Similarly, a heterosexual infected with HIV through unprotected sex would be more likely to impact the sexual behaviour of heterosexual adolescents simply because the circumstances surrounding his/her infection would be more meaningful to them.

## **6.2 Recommendations for communities**

As stated earlier, not every youth passing through adolescence will take risks. Unfortunately, those who wish to, usually do. Not all risk taking goes beyond the experimental stage.

Unfortunately it often does and even an adolescent only intending to experiment can be harmed.

Focus group comments/survey responses mentioned earlier indicate that adolescents take risks even when they have been educated about the consequences. If this is the case, then communities would do well to widen their focus to better protect those who will take risks anyway.

### **6.2.1 Increase stakeholder interaction and improve capacities to identify adolescents at risk**

Regardless of the reasons that youth take risks, effectively protecting them from harm should they become involved in risky activities will require the co-ordinated involvement of multiple community stakeholders.

Educators can inform and may to some extent monitor adolescent activities during after school hours. Health workers, law enforcement officials and even community recreation workers in their day to day interactions with youth should reinforce the message established by educators.

Educators, health workers, law enforcement officials and community recreation/youth workers should be equally trained and otherwise equipped to identify youth with serious substance abuse problems as well as those who are at immediate risk of accident or injury because they are currently drinking or using drugs. Indeed, education based programs may prove more protective if they include components that allow community law enforcement officials and health personnel to interact with students and with each other in the presence of students.

### **6.2.2 Focus on protection not punishment**

The role of community stakeholders in such a co-ordinated effort would be to identify and protect those at immediate risk either of overdose or from other contributing factors. This does not suggest that risk behaviours should go unpunished; however, fear of punishment or parental disappointment may prevent adolescents from seeking assistance from an adult/authority figure when they need it. If Steinberg is correct in his assumption that adolescent risk taking is inevitable; then parents and all youth focussed organisations may need to be more vigilant but also appear as a source of non- judgmental protection.

### **6.2.3 Maximize involvement of community members at large**

Generally speaking, programs that require extensive training of all participants are limited by budget and the commitment of the participants. A more effective use of resources would be to

establish a broad cadre of informed gatekeepers who can guide those at risk to fully trained partners. The yellow ribbon program<sup>95</sup>, a well established intervention originally started to address teen suicide, presents a useful model which is based on non-judgmental protection. Recognizing the difficulty adolescents can have in articulating personal problems, the Yellow Ribbon Program supplies adolescents with cards which function as markers that can be cashed in at any time without question whenever an adolescent need help. Instructions on the card allow even uninformed adults to take appropriate action. This card allows adults in the community to function as non-judgmental and effective conduits to fully trained support organisations and individuals. Such a joint venture among community stakeholders could work as well in helping youth avoid the perils associated with substance abuse.

### **6.3 Recommendations to improve parental influence**

Parents may be under the impression that there little they can do to impact the behaviour of their children. Despite the potential inevitability of adolescent risk taking, parents are not without influence. Parental knowledge of youth activities and whereabouts and parental control (setting rules and disciplining) in this study were both associated with reduced substance use, smoking and unsafe sex. Similarly, the comments of focus group respondents in Labrador indicate that these adolescents did not want to disappoint their parents and feared the repercussions of being caught using drugs or alcohol implying that parents do, to some extent at least, enter into an adolescents risk evaluation process, however limited as that process may be.

### **6.3.1 Limit risk taking opportunities**

Parental control occurs when parents impose rules and restrictions on their child's activities and associations to reduce the freedom their child has to do things without telling them. Within the context of limiting risk taking opportunities, the protective impact of supervised group activities deserves special mention. Parents who encourage group activity can instill structure and safety in their child's life in ways that appear supportive rather than restrictive. Also, group activities can reduce adolescent exposure to risk during the after school hours<sup>96</sup>, a crucial time when parents may not be able to supervise effectively given job constraints and responsibilities. Sports related activities in particular appear to require a commitment that may often, if not always, protect adolescents from extreme behaviour. Youth in the Labrador focus groups pointed out that they would be less likely to drink or use drugs if it meant they would be kicked off their sports team.

### **6.3.2 Maintain/nurture good parents child communications**

Parents currently enjoying high levels of adolescent disclosure should strive to maintain that communication level. Literature indicates that, unlike parental solicitation, voluntary disclosure by adolescents about their activities has a strong association with reduced risk taking.

Supportive two way communication can also make imposing structure and control through rule setting a less arbitrary process. The degree to which an adolescent is involved in establishing the rules of behaviour is what differentiates the authoritative parenting style from the authoritarian parenting style. Authoritative parents are more consistent in their rule setting and explanations concerning the rules they set. Control imposed without adolescent involvement (in a non-

responsive environment) may be resented or misunderstood, and thus a less successful monitoring device.

### **6.3.3 Increase community support for parenting programs**

Generally speaking, the decision to improve parenting skills is often reactionary; resulting from a child's undesirable behaviour. Existing support for parents in many communities is limited to caring for the very young and/or dealing with the adolescents whose behaviour is already problematic with little or no resources available to support pre-emptive parenting in which parents are taught to identify changes in the behaviour of their adolescent children and adapt their own parenting methods accordingly.

## **6.4 Recommendation for future research**

### **6.4.1 Group membership**

Interestingly, group membership as a deterrent to risk taking was equally protective against each of the risk behaviours in both the younger and older age groups whereas parental knowledge was less protective of smoking, drinking and unsafe sex among the older age group. Perhaps, group membership as a deterrent to risk taking is more protective across age groups, because it is a more subtle method of curbing or controlling youth activities than parental knowledge, rule setting or threat of punishment.

It is equally plausible that the protectiveness of group membership arises from the timing of group activities. It may be that group activities occur mostly after school providing supervision to

those involved during a time of day when other parental monitoring activities are less rigorous. I can draw no conclusions in this study about whether or not the type of group, the number of different groups, the frequency of group activities, or the length of membership in a group would alter the protectiveness of group membership as it is defined in this study.

#### **6.4.2 Parental knowledge**

I can draw no conclusions as to why the protectiveness of parental knowledge about youth activities varies between the two age groups. It may result from changes in parent child communication as the child ages. Perhaps voluntary child disclosure, identified in the literature as the parent child interaction most associated with reduced risk taking, decreases as the adolescent ages and is exposed to different environmental influences including more risk taking peers. These are subtleties that cannot be addressed in this study. More information about the ways in which parents obtain their knowledge may be useful in distinguishing whether parental knowledge actually protects against risk taking or reinforces the choices already made by risk averse adolescents. More concise information about the ways in which parents remain knowledgeable about their children's lives would also be of benefit to parenting programmes.

#### **6.4.3 Parental control**

The processes involved in rule setting were not well defined in this study. The fact that rule setting could be protective even when discipline for breaking the rules was inconsistently applied might indicate that the parent child interaction around rule setting contributes to an adolescent's resilience to risk taking over and above simple limit setting. Literature indicates that this

interaction, if two way, and consistent across conceptual domains<sup>36 37</sup> can contribute to the adolescents understanding of societal concepts which may promote resiliency.

#### **6.4.4 Exposure to forced sex**

By nature of its definition, forced sex is not an activity that one chooses; consequently, it was treated as a predictor of the other risk behaviours in this study. Although it was found to be associated with all of the risk behaviours and with having drinking and drug using friends, I was unable to examine in any detail, the circumstances in which the unwanted sexual activity occurred nor to examine the indirect impact it had on adolescent risk taking by examining its effect on social well being and self- esteem.

Table 1 Demographics of the study population

	Newfoundland	Labrador	Total
Number of schools - grades 10-12	7	2	9
Number of schools grades 7-9	8	3	11
Number of schools grades 7-12	9	5	14
Number of respondents	4894	1728	6622
Number of Males	49%(2422/4886)	49%(847/1726)	49%(3269/6612)
Number of respondents under the age of 16	61%(2993/4887)*	64%(1110/1724)*	62%(4103/6611)
P value < 0.05			

Table 2: Rates of smoking by sex, age group and survey area

	Total	Male (n=3246)	Female (n=3331)	Under 16 (n=4084)	16 years & Over (n=2492)	Nfid (n=4867)	Lab (n=1720)
Smoking (any)	40%	40%	39%	33%*	50%*	42%*	34%*
Smoking (regular)	28%	30%*	26%*	21%*	40%*	29%*	25%*
Smoking (heavy)	10%	13%*	7%*	6%*	17%*	11%	9%
*p<0.05							

Table 3: Age when first smoked

Age	Total (n=3124)	First cigarette			
		Male (n=1491)	Female (n=1628)	Nfld (n=2269)	Labrador (n=855)
12 and under	50%	53%*	47%*	48%*	56%*
13 years	23%	20%*	26%*	25%*	17%*
14 years	15%	14%	16%	15%	14%
15 years	8%	8%	7%	8%	8%
16 years	3%	3%	3%	3%	4%
17 years	1%	2%	1%	1%	1%
18 years & over	0.2%	0.2	-	-	-
Under sixteen	96%	95%	96%	96%	95%
Sixteen and over	4%	5%	4%	4%	5%

\*P<0.05

Table 4: Current smokers (any smoking) by age

Respondent Age	Any smoking	Males	Females	Nfld	Labrador
12 years and under	15%(n=838)	16%(n=406)	14%(n=431)	15%(n=562)	14%(n=276)
13 years	27%(n=917)	24%(n=428)	29%(n=487)	29%(n=644)	22%(n=273)
14 years	39%(n=1074)	36%(n=506)	41%(n=566)	41%(n=807)*	33%(n=267)*
15 years	45%(n=1255)	45%(n=618)	45%(n=636)	48%(n=968)*	35%(n=287)*
16 years	48%(n=1196)	49%(n=602)	48%(n=594)	50%(n=932)*	42%(n=264)*
17 years	50%(n=1100)	51%(n=549)	48%(n=549)	51%(n=817)	46%(n=283)
18 years and over	64%(n=196)	61%(n=132)	70%(n=63)	57%(n=130)*	79%(n=66)*
*p<0.5					

Table 5: Current smokers (every day) by age

Respondents Age	Regular smoking	Males	Females	Nfld	Labrador
12 years and under	6%(n=838)	5%(n=406)	6%(n=431)	4%(n=562)*	8%(n=276)*
13 years	14%(n=917)	14%(n=428)	14%(n=487)	14%(n=644)	14%(n=273)
14 years	23%(n=1074)	24%(n=506)	22%(n=566)	22%(n=807)	25%(n=267)
15 years	34%(n=1255)	37%(n=618)	31%(n=636)	35%(n=968)	31%(n=287)
16 years	38%(n=1196)	41%(n=602)*	35%(n=594)*	40%(n=932)*	30%(n=264)*
17 years	38%(n=1100)	42%(n=549)*	34%(n=549)*	40%(n=817)*	30%(n=283)*
18 years and over	60%(n=196)	55%(n=132)	70%(n=63)	52%(n=130)*	75%(n=66)*
*p<0.5					

Table 6: Current smokers (more than 10 cigarettes per day) by age

Respondent Age	Heavy smoking	Males	Females	Nfld	Labrador
12 years and under	1%(n=838)	0.5%(n=406)	1%(n=431)	0.5%(n=562)	1%(n=276)
13 years	2%(n=917)	2%(n=428)	2%(n=487)	1.5%(n=644)	3%(n=273)
14 years	8%(n=1074)	9%(n=606)	6%(n=566)	7%(n=607)	10%(n=267)
15 years	12%(n=1255)	16%(n=618)*	8%(n=636)*	13%(n=968)	11%(n=387)
16 years	14%(n=1196)	19%(n=602)*	9%(n=596)*	15%(n=932)	12%(n=264)
17 years	17%(n=1100)	21%(n=549)*	13%(n=549)*	19%(n=817)*	12%(n=283)*
18 and over	30%(n=196)	30%(n=132)	29%(n=63)	26%(n=130)	36%(n=66)
*p<0.5					

Table 7: Rates of drinking by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Labrador
Drinking (any)	56%	58%* (1882/3269)	54%* (1791/3339)	43%* (1779/4100)	76%* (1894/2507)	60%* (2960/4893)	42%* (720/1725)
Drinking (regular)	30%	36%* (1172/3246)	25%* (813/3321)	22%* (891/4073)	44%* (1095/2493)	32%* (1542/4861)	26%* (447/1716)
Drinking & driving	11%	16%* (524/3230)	5%* (165/3308)	9%* (365/4048)	13%* (324/2489)	11% (510/4831)	11% (182/1717)

\*p<0.05

Table 8: Age when first drank alcohol

Age	Total (n=4172)	First alcohol use		Nfld (n=3250)	Labrador (n=922)
		Male (n=2127)	Female (n=2039)		
12 and under	35%	42%*	29%*	36%	33%
13 years	32%	28%*	36%*	34%*	26%*
14 years	19%	17%*	21%*	18%*	22%*
15 years	9%	9%	9%	9%	12%
16 years	3%	3%	4%	3%	5%
17 years	1%	1%	1%	1%	2%
18 years & over	0.2%	0.2%	0.2%	-	-
Under sixteen	96%	96%	95%	96%	93%
Sixteen and over	4%	4%	5%	4%	7%

\*P<0.05

Table 9: Current drinkers (any drinking) by age

Age	Any drinking	Males	Females	Nfld	Labrador
12 years and under	13%(n=839)	15%(n=407)*	10%(n=431)*	14%(n=562)	9%(n=277)
13 years	30%(n=926)	30%(n=435)	30%(n=489)	35%(n=652)*	19%(n=274)*
14 years	51%(n=1080)	50%(n=511)	52%(n=567)	56%(n=810)*	37%(n=270)*
15 years	57%(n=1255)	70%(n=619)*	63%(n=635)*	74%(n=968)*	45%(n=287)*
16 years	73%(n=1206)	74%(n=607)	72%(n=599)	76%(n=941)*	63%(n=265)*
17 years	77%(n=1106)	79%(n=553)	75%(n=551)	80%(n=823)*	68%(n=283)*
18 years and over	83%(n=195)	83%(n=132)	81%(n=62)	85%(n=130)	77%(n=65)

\*P<0.05

Table 10 Current drinkers (more than once a month in the last six month) by age

Age	Regular drinking	Males	Females	Nfld	Labrador
12 years and under	5%(n=831)	6%(n=401)	4%(n=429)	5%(n=556)	5%(n=275)
13 years	14%(n=919)	16%(n=432)	12%(n=485)	15%(n=647)	11%(n=272)
14 years	24%(n=1073)	26%(n=506)	23%(n=565)	25%(n=805)	22%(n=268)
15 years	37%(n=1250)	45%(n=616)*	30%(n=633)*	40%(n=965)*	28%(n=285)*
16 years	42%(n=1196)	49%(n=603)*	35%(n=593)*	43%(n=932)	39%(n=264)
17 years	44%(n=1102)	53%(n=552)*	34%(n=548)*	43%(n=820)	44%(n=282)
18 years and over	56%(n=195)	60%(n=131)	48%(n=63)	57%(n=129)	55%(n=66)
*p<0.05					

Table 11 Rates of drug use by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
Drug use (any)	34%	37%* (1208/3257)	31%* (1044/3335)	23%* (942/4088)	52%* (1307/2503)	33%* (1616/4884)	37%* (638/1718)
Drug use (last 6 months)	27%	31%* (1015/3244)	23%* (768/3333)	19%* (774/4078*)	40%* (1005/2497)	27% (1312/4864)	27% (472/1722)
*p<0.05							

Table 12 Age when first used drugs

Age	First drug use				
	Total (n=2237)	Male (n=1198)	Female (n=1039)	Nfld (n=1602)	Labrador (n=637)
12 and under	15%	18%*	12%*	11%*	28%*
13 years	21%	21%	21%	22%	20%
14 years	26%	24%*	29%*	29%*	20%*
15 years	21%	20%*	23%*	23%*	18%*
16 years	12%	12%	12%	13%	11%
17 years	3%	3%	3%	3%	3%
18 years & over	0.4%	0.7%	0.1%	1%	-
under sixteen	85%	84%	85%	83%	86%
sixteen and over	15%	16%	15%	17%	14%

\*P<0.05

Table 13: Current drug user (any use) by age

Age	Any drug use	Males	Females	Nfld	Labrador
12 years and under	5%(n=836)	5%(n=405)	5%(n=430)	3%(n=564)*	10%(n= 274)*
13 years	13%(n=922)	15%(n=432)	12%(n=488)	10%(n=649)*	19%(n= 273)*
14 years	26%(n=1076)	28%(n=508)	25%(n=566)	24%(n=808)*	33%(n= 268)*
15 years	40%(n=1254)	43%(n=618)*	37%(n=635)*	38%(n=968)	44%(n= 286)
16 years	49%(n=1202)	52%(n=605)	46%(n=597)	48%(n=937)	53%(n=265)
17 years	54%(n=1105)	57%(n=552)*	50%(n=551)*	53%(n=823)	55%(n=282)
18 years and over	64%(n=196)	68%(n=132)	57%(n=63)	61%(n=130)	71%(n=66)
*p<0.05					

Table 14 Current drug users (used in last six months) by age

Age	Drug use in last six months	Males	Females	Nfld	Labrador
12 years and under	4%(n=834)	4%(n=402)	4%(n=414)	2%(n=558)*	8%(n=276)*
13 years	11%(n=918)	13%(n=430)*	8%(n=445)*	10%(n=646)	12%(n=272)
14 years	23%(n=1075)	26%(n=505)*	20%(n=454)*	22%(n=804)	26%(n=271)
15 years	32%(n=1251)	36%(n=616)*	28%(n=456)*	32%(n=965)	32%(n=286)
16 years	39%(n=1199)	44%(n=603)*	35%(n=388)*	39%(n=934)	41%(n=265)
17 years	40%(n=1103)	46%(n=552)*	34%(n=365)*	40%(n=821)	40%(n=282)
18 years and over	48%(n=195)	55%(n=131)*	35%(n=41)*	47%(n=129)	50%(n=66)
*p<0.05					

Table 15: Rates of sexual activity by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
Ever had sex	35%	37%* (1182/3240)	33%* (1096/3321)	21%* (849/4067)	57%* (1427/2492)	36%* (1751/4859)	31%* (531/1711)
Had sex in last 6 months	30%	30% (944/3167)	30% (993/3300)	17%* (690/4010)	51%* (1245/2457)	31% (1477/4767)	27% (463/1709)
Had multiple partners last 6 months	9%	11%* (355/3136)	8%* (246/3289)	6%* (240/3975)	15%* (362/2448)	9% (440/4724)	10% (164/1709)
had unsafe sex last 6 months	16%	14%* (446/3123)	18%* (583/3278)	8%* (328/3963)	29%* (698/2438*)	17% (n=4700)	15% (n=1709)
*p<0.05							

Table 16: Age when first had sex

Age	First sexual intercourse				
	Total (N=2284)	Male (N=1184)	Female N=1096)	Nfld (n=1751)	Labrador (n=533)
12 and under	15%	20%*	10%*	15%	14%
13 years	19%	19%	19%	18%	21%
14 years	25%	22%*	28%*	25%	24%
15 years	21%	19%*	23%*	22%	18%
16 years	15%	14%	16%	15%	16%
17 years	4%	5%	4%	4%	6%
18 years & over	1%	1%	0.3%	1%	1%
under sixteen	80%	80%	80%	95%	93%
sixteen and over	20%	20%	20%	5%	7%
P<0.05					

Table 17 Sexual activity (any) by age

Age	Ever had sex	Males	Females	Nfld	Labrador
12 years and under	3%(n=832)	5%*(n=401)	2%*(n=430)	4%(n=556)	2%(n=276)
13 years	11%(n=917)	15%*(n=429)	8%*(n=486)	11%(n=648)	11%(30/269)
14 years	22%(n=1069)	25%(n=508)	20%(n=560)	22%(n=806)	22%(n=263)
15 years	39%(n=1249)	41%(n=616)	37%(n=632)	40%(n=962)	35%(n=287)
16 years	51%(n=1175)	50%(n=600)	53%(n=595)	53%(n=931)*	45%(n=264)*
17 years	60%(n=1102)	59%(n=550)	61%(n=550)	61%(n=820)	58%(282)
18 years and over	79%%(n=195)	74%(n=131)	87%(n=63)	76%(n=129)	83%(n=66)

\*p<0.05

Table 18 Sexual activity (in last six months) by age

Age	Sex in the last 6 months	Males	Females	Nfld	Labrador
12 years and under	2%(n=828)	3%(n=399)	2%(n=428)	3%(n=552)	1%(n=276)
13 years	10%(n=908)	12%*(n=423)	7%*(n=483)	9%(n=639)	10%(n=269)
14 years	18%(n=1057)	18%(n=497)	18%(n=559)	18%(n=794)	18%(n=263)
15 years	32%(n=1217)	32%(n=592)	33%(n=624)	33%(n=932)	30%(n=285)
16 years	45%(n=1180)	41%*(n=587)	48%*(n=593)	47%*(n=916)	38%*(n=264)
17 years	54%(n=1089)	52%(n=542)	56%(n=545)	55%(n=807)	53%(n=282)
18 years and over	68%%(n=188)	62%*(n=124)	80%*(n=63)	65%(n=122)	74%(n=66)
*p<0.05					

Table 19 Sexual activity with multiple partners (last six months) by age

Age	More than one partner in the last 6 months	Males	Females	Nfld	Labrador
12 years and under	1%(n=813)	1%(n=388)	1%(n=425)	1%(n=537)	1%(n=276)
13 years	5%(n=893)	10%*(n=415)	2%*(n=480)	4%(n=624)	6%(n=269)
14 years	6%(n=1046)	8%(n=489)	5%(n=556)	6%*(n=783)	9%*(n=263)
15 years	10%(n=1207)	10%(n=586)	9%(n=620)	10%(n=922)	10%(n=285)
16 years	13%(n=1175)	15%(n=584)	12%(n=591)	13%(n=911)	13%(n=264)
17 years	14%(n=1081)	16%*(n=537)	12%*(n=542)	15%(n=799)	13%(282)
18 years and over	27%%(n=188)	28%*(n=124)	22%*(n=63)	22%(n=122)	35%(n=66)
*p<0.05					

Table 20 Unsafe sexual activity (last six months) by age

Age	Unsafe sex	Males	Females	Newfoundland	Labrador
12 years and under	1%(n=814)	1%(n=388)	1%(n=426)	1%(n=538)	1%(n=276)
13 years	5%(n=897)	5%(n=418)	4%(n=477)	5%(n=628)	4%(n=269)
14 years	8%(n=1046)	7%(n=489)	9%(n=556)	8%(n=783)	8%(n=263)
15 years	16%(n=1206)	14%*(n=585)	19%*(n=620)	16%(n=921)	18%(n=285)
16 years	24%(n=1173)	21%*(n=583)	28%*(n=590)	25%(n=909)	21%(n=264)
17 years	31%(n=1077)	26%*(n=534)	35%*(n=541)	32%(n=795)	27%(n=282)
18 years and over	46%(n=188)	39%*(n=124)	60%*(n=63)	43%(n=122)	52%(n=66)
*p<0.05					

Table 21: Rates of multiple risk behaviours by sex, age group and survey area

Number of Risk behaviours	% of population (n=6524)	Males (n=3208)	Females (n=3307)	Under sixteen (n=4037)	Sixteen and over (n=2476)	Newfoundland (n=4820)	Labrador (n=1704)
None	55%	50%	60%	66%	37%	54%	59%
Drinking only	8%	9%	6%	7%	9%	8%	5%
Smoking only	6%	5%	7%	5%	7%	6%	6%
Drug use only	4%	4%	4%	3%	5%	4%	4%
Smoking and Drinking	4%	4%	4%	3%	6%	5%	3%
Smoking and Drug use	5%	5%	5%	4%	7%	5%	6%
Drinking and Drug use	6%	7%	5%	4%	9%	6%	7%
Smoking/drinking/drugs	13%	16%	10%	9%	20%	14%	11%
Total with 2 or more risk behaviours	28%	32%	23%	19%	42%	28%	26%

Table 22 Peer drinking and drug use by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
Half or more of friends drink	57%	55% (1808/3261)	58% (1924/3330)	43%* (1756/4087)	79%* (1975/2503)	61%* (2984/4881)	44%* (752/1719)
Half or more of friends use drugs	26%	27% (872/3246)	25% (827/3328)	17%* (710/4074)	40%* (986/2499)	25% (1237/4867)	27% (463/1717)
*p<0.05							

Table 23: Rates of unwanted sexual activity reported by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
	(N=6500)	(n=3201)	(n=3290)	(n=4003)	(n=2486)	(n=4804)	(n=1696)
Experienced unwanted sex	16%	11%*	20%*	14%*	18%*	18%*	10%*
*p<0.05							

Table 24: Intact families reported by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
	(N=6562)	(n=3227)	(n=3325)	(n=4059)	(n=2493)	(n=4835)	(n=1727)
Live in an intact household	80%	79%	80%	81%*	78%*	83%*	71%*
*p<0.05							

Table 25 Parental knowledge of whereabouts reported by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfid	Lab
		n=3231	n=3327	n=4059	n=2497	n=4857	n=1710
Parents consistently knew whereabouts	61%	53%*	68%*	63%*	57%*	59%*	65%*

\*p<0.05

Table 26 Parental rule setting reported by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
		(n=3231)	(n=3327)	(n=4059)	(n=2497)	(n=4857)	(n=1710)
Parents consistently set rules	61%	53%*	68%*	63%*	57%*	83%*	71%*

\*p<0.05

Table 27 Parental discipline reported by sex, age group and survey area

	Total	Male	Female	Under 16	16 years & Over	Nfld	Lab
		(n=3226)	(n=3325)	(n=4059)	(n=2494)	(n=4852)	(n=1708)
Parents consistently discipline when rules are broken	66%	63%*	68%*	71%*	58%*	68%*	61%*

\*p<0.05

Table 28 Group membership reported by sex age group and survey area

	Total	Male (n=3207)	Female (n=3300)	Under 16 (n=4022)	16 years & Over (n=2483)	Nfld (n=4807)	Lab (n=1709)
Member of a group	51%	48%*	55%*	57%*	43%*	47%*	63%*
*p<0.05							

Table 29 The combined impact of factors on smoking

Factor influencing an adolescent decision not to smoke	Odds Ratio (95% Confidence interval)	MH summary Chi Square
Does not drink	2.0 (1.7 - 2.4)	76.95
Does not use drugs	3.7 (3.2 - 4.4)	254.82
Has few friends who drink	1.6 (1.3 - 1.9)	23.82
Has few friends who use drugs	1.6 (1.4 - 1.9)	27.67
Has not had unsafe sex	2.0 (1.7 - 2.4)	59.48
Has never been forced to have sex	1.7 (1.4 - 2.1)	31.97
Lives with both parents	1.6 (1.4 - 1.9)	29.83
Parents usually know whereabouts	1.4 (1.2 - 1.6)	20.37
Parents punish consistently	1.3 (1.1 - 1.5)	7.87
Belongs to a group	1.7 (1.5 - 2.0)	53.78

Table 30 The combined impact of factors on drinking

Factor influencing an adolescent decision not to drink	Odds Ratio (95% Confidence interval)	MH summary Chi Square
Does not smoke	1.9 (1.6 - 2.3)	65.82
Does not use drugs	3.6 (3.0 - 4.2)	215.88
Has few friends who drink	5.7 (4.8 - 6.9)	332.36
Has few friends who use drugs	1.4 (1.2 - 1.7)	13.42
Has not had unsafe sex	1.5 (1.2 - 1.8)	16.26
Has never been forced to have sex	1.3 (1.1 - 1.6)	9.1
Parents usually know whereabouts	1.6 (1.4 - 1.9)	36.8
Parents set rules consistently	1.3 (1.1 - 1.5)	8.99
Age	1.2 (1.0 - 1.4)	6.37
Sex	0.5 (0.5 - 0.6)	67.61

Table 31: The combined impact of factors on drug use

Factor influencing an adolescent decision not to use drugs	Odds Ratio (95% Confidence interval)	MH summary Chi Square
Does not smoke	3.6 (3.1 - 4.2)	270.58
Does not drink	3.3 (2.8 - 3.9)	220.73
Has few friends who drink	1.8 (1.4 - 2.2)	27.69
Has few friends who use drugs	5.7 (4.9 - 6.7)	452.37
Has not had unsafe sex	1.8 (1.5 - 2.2)	41.33
Lives with both parents	1.3 ( 1.1 - 1.6)	9.31
Parents usually know whereabouts	1.5 (1.3 - 1.8)	24.66
Sex	0.7 (0.6 - 0.8)	22.71

Table 32: The combined impact of factors on unsafe sex

Factor influencing an adolescent decision not to have unsafe sex	Odds Ratio (95% Confidence interval)	MH summary Chi Square
Does not smoke	2.0 ( 1.6 - 2.4)	50.32
Does not drink	1.4 (1.2 - 1.8)	12.27
Does not use drugs	1.8 (1.5 - 2.3)	33.64
Has few friends who drink	1.5 (1.2 - 2.0)	11.32
Has few friends who use drugs	1.5 (1.2 - 1.8)	12.39
Has never been forced to have sex	1.9 (1.6 - 2.4)	44.76
Lives with both parents	1.4 (1.1 - 1.7)	8.88
Parents punish consistently	1.3 (1.1 - 1.6)	8.71
Membership in a group	1.3 (1.1 - 1.5)	6.02
Age	2.5 (2.1 - 3.0)	105.62
Sex	1.6 (1.3 - 1.9)	26.52

Table 33: Summary of the relationship between factors

Preventive factor	No Smoking (at least one cigarette every day) (OR, 95%CI)	DRINKING (more than once a month in the last six months)	DRUG USE (any use in the last six months)	UNSAFE SEX (had sex without a condom in the last six months)
Does not smoke		1.9 (1.6 - 2.3)	3.6 (3.1 - 4.2)	2.0 ( 1.6 - 2.4)
Does not drink	2.0 (1.7 - 2.4)		3.3 (2.8 - 3.9)	1.4 (1.2 - 1.8)
Does not use drugs	3.7 (3.2 - 4.4)	3.6 (3.0 - 4.2)		1.8 (1.5 - 2.3)
Has few friends who drink	1.6 (1.3 - 1.9)	5.7 (4.8 - 6.9)	1.8 (1.4 - 2.2)	1.5 (1.2 - 2.0)
Has few friends who use drugs	1.6 (1.4 - 1.9)	1.4 (1.2 - 1.7)	5.7 (4.9 - 6.7)	1.5 (1.2 - 1.8)
Has never had unsafe sex	2.0 (1.7 - 2.4)	1.5 (1.2 - 1.8)	1.8 (1.5 - 2.2)	
Has never been forced to have sex	1.7 (1.4 - 2.1)	1.3 (1.1 - 1.6)		1.9 (1.6 - 2.4)
Lives with both parents	1.6 (1.4 - 1.9)		1.3 ( 1.1 - 1.6)	1.4 (1.1 - 1.7)
Parents know whereabouts	1.4 (1.2 - 1.6)	1.6 (1.4 - 1.9)	1.5 (1.3 - 1.8)	
Parents set rules consistently		1.3 (1.1 - 1.5)		
Parents discipline consistently	1.3 (1.1 - 1.5)			1.3 (1.1 - 1.6)
Membership in a group	1.7 (1.5 - 2.0)			1.3 (1.1 - 1.5)
Age		1.2 (1.0 - 1.4)		2.5 (2.1 - 3.0)
Sex		0.5 (0.5 - 0.6)	0.7 (0.6 - 0.8)	1.6 (1.3 - 1.9)

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