Preventative Counselling for Nova Scotia Adolescents: Examining Predictors of its Provision in Several Communities

by

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For my parents, William Corbett and Marit Quist-Corbett, whose passion for life, love for each other and courage in the face of adversity have taught me all I need to know.

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ABSTRACT

This project examined the extent to which Nova Scotian adolescents' counselling needs are being met with respect to physical, sexual, substance use, and psychosocial health by their family physicians. This was accomplished by assessing how well Nova Scotian physicians provide preventative advice consistent with the Guidelines for Adolescent Preventative Services (GAPS). Analyses were performed using pooled data from surveys carried out in 2003 and 2006. Descriptive analyses as well as Poisson and logistic regression were used to examine associations of sociodemographic characteristics, need, and the presence of school based health centres (SBHCs) with the provision of advice. Advice was not well provided and appeared to be need-driven. Females were significantly more likely to be provided advice and respondent access to a SBHC increased the likelihood of advice being provided. These results have implications for policy and practice, specifically, ways to refine preventative healthcare services for the province's adolescents to ensure optimal and comprehensive care for youth.

LIST OF ABBREVIATIONS AND SYMBOLS USED

AHRSR – The Adolescents and Health Related Services Research Study

AMA – American Medical Association

CBHSE – The Cape Breton Health Service Evaluation Study

CES-D – Centre for Epidemiologic Studies Depression Scale

DHPP – Department of Health Promotion and Protection

DSM – Diagnostic and Statistical Manual of Mental Disorders

GAPS – Guidelines for Adolescent Preventive Services

HIV – Human Immunodeficiency Virus

LDOR – Least Detectable Odds Ratio

NSHRF – Nova Scotia Heath Research Foundation

OR – Odds Ratio

PDR – Personal Development and Relationships

RR – Relative Risk

SBHC – School Based Health Centre

SES – Socioeconomic Status

STI – Sexually Transmitted Infection

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CHAPTER 1.0 INTRODUCTION

1.1 Introduction

Adolescence, particularly the high school years between grade 9 and 12, is a time in which youth often place themselves and their peers at considerable risk due to their behavioural and health related choices. Initiatives designed to mitigate the impact of these risky behaviours should be implemented and supported to achieve optimal outcomes. Preventative counselling centres on the idea that the health care practitioner can identify potentially harmful health behaviours in their patients and provide them with the information required to avert negative health outcomes. These health behaviours and their potential outcomes include sexual, physical, mental, and/or psychosocial health. For example, a physician who has learned that her teenage patient has become sexually active can counsel her on condom use which can, in turn, have an effect on her risk of sexually transmitted infection (STI) transmission.

Preventative counselling has been shown to be associated with changes in adolescent health risk behaviours; however, the exact mechanism of these changes remains unknown (Stephens, 2006). While the incidence and prevalence of such behaviours may vary following the provision of preventative advice, this seems to be heavily dependent on the nature of the preventative initiative. Providing adolescents with information via preventative education campaigns has been shown to have very little effect on actual risk behaviour change, while direct counselling that is targeted to the needs of the adolescent may achieve better outcomes (Botvin et al., 1995).

Nova Scotian adolescents are engaging in behaviours deleterious to their health such as impaired driving, unprotected intercourse with multiple partners and increased drug and alcohol use. These have been documented in the Nova Scotia Student Drug Use Survey (Poulin, 2002) and by researchers such as Langille et al. (2001). Although Nova Scotian adolescents (aged 15-19) seem to be following the national trend of decreased prevalence of recent smoking (in the last 30 days), they are still reporting high rates from a public

health perspective (22.2%) (Poulin, 2002). In addition, amongst Canadian adolescents, there seems to be an upward trend of cannabis use with each increasing grade, a drug which can significantly impair an individual's decision making ability (Poulin and Elliott, 2007). Since risk behaviours have been shown to be associated with each other it is of value to initiate programs designed to target these behaviours comprehensively and support them to achieve their ideal outcomes.

This project examined how effectively Nova Scotian adolescents' counselling needs with respect to preventing substance abuse, negative sexual health outcomes, and mental health concerns are being met. This was accomplished by assessing how well Nova Scotian doctors provide preventative advice consistent with established guidelines, the Guidelines for Adolescent Preventative Services (GAPS). These guidelines were developed by the American Medical Association (AMA) and offer a systematic approach to evaluating the comprehensiveness of preventative health advice provided to adolescents. The Guidelines consist of 24 clinical preventative service recommendations which direct physicians to conduct risk assessment with adolescents via opportunistic screening on a yearly basis in the areas of emotional, physical and social behaviours and well-being (Montalto, 1998; Low, 2003).

This thesis is organized as follows: firstly, a rationale for the project is provided, including project objectives. This is followed by a review of the preventative counselling literature where gaps in current knowledge are identified. Next, the research methods are described, including the study population, data, measures and analysis. The data for the research project was drawn from a pooled dataset from two school-based surveys in Nova Scotia in 2003 and 2006. The results of the analyses of this combined dataset are presented for each research question. Each research questions is explored in the discussion section, with a particular focus on comparing key findings to the broader literature.

1.2 Relevance of the Research

Adolescents indicate their need for access to preventative information, and guidelines exist on the nature of the preventative advice that they should receive (Steiner and Gest, 1996). The Nova Scotia Department of Health Promotion and Protection (DHPP) has many youth focused initiatives targeted at addictions, sexual health and healthy eating, all of which are addressed through strategies which mirror the GAPS approach (NSDHPP, 2009). Emphasizing not only biomedical strategies but psychosocial ones, the DHPP has given its support for comprehensive preventative counselling (NSDHPP, 2009). Similarly, the DHPP is involved in the implementation of guidelines for school-based health centres (SBHCs), in which Nova Scotia is a national leader. Research into the extent of preventative counselling to adolescents by physicians and its relationship with access to SBHCs is in keeping with the strategic directions of the Department of Health Promotion and Protection (NSDHPP, 2009). Despite this, to date there has been very little research into how well the preventative counselling needs of adolescents are being met by physicians in the Canadian context and, more specifically, how well preventative counselling services are being provided by these healthcare providers in Nova Scotia. In order to ensure that adolescents' health care needs are being met it would be ideal to have more information on the delivery of preventative counselling and which individuals receive this type of advice, especially with respect to certain sociodemographic characteristics. There is a very real requirement for a study of Nova Scotian adolescent preventative counselling provision. In fact the objectives and methods of this planned research have been reviewed by Mr. Robert Wright, Executive Director of the Child and Youth Strategy (Department of Community Services), who has indicated strong agreement with the importance of such work and interest in the results (personal communication, 2008).

In summary, more effectively targeting the risk behaviours in which adolescents engage in, and preventing subsequent negative health outcomes will contribute to a healthier population overall. This indicates a need for a comprehensive approach to address the health risk behaviours of adolescents which, in turn, means a need to understand, among other things, the extent to which adolescents receive preventative advice from physicians

about such behaviours. This thesis sets out to achieve that goal. The results of this research will be important for policy and intervention in terms of understanding how healthcare services for the province's adolescents can be refined and enhanced to ensure optimal and comprehensive preventative services for youth.

CHAPTER 2.0 OBJECTIVES AND RESEARCH QUESTIONS

The purpose of this study was to gain an understanding of the extent to which Nova Scotian adolescents receive preventative counselling, the factors that predict their receipt of such care, and whether need for preventative services predicts the provision of preventative advice. Preventative counselling addresses such behaviours as physical and substance abuse, and sexual and mental health concerns in accordance with a GAPS approach. The research also examined whether youth with SBHC access receive more preventative advice than those without access. In all analyses, the research considered gender differences in the provision of counselling. The ultimate goal of gathering and analysing this information was to add to the body of knowledge on the topic in order to increase its potential to improve outcomes in adolescent health. This will be accomplished by becoming more aware of the areas in which the province's physicians are both succeeding and failing to provide preventative advice to adolescents and finding ways to ensure that they optimally provide advice about the health risk behaviours in which adolescents frequently engage.

The **research questions** for this thesis were fourfold:

2.1 To What Extent Do Youth Receive Preventative Advice From Physicians in Accordance With GAPS in Specific Health Related Areas?

Youth place themselves at considerable physical, sexual, and emotional risk during adolescence and preventative counselling has shown potential in reducing the likelihood of engaging in risky behaviours (Elster and Levenberg, 1997; Ozer et al., 2003). Guidelines such as GAPS have been developed to improve on the efficacy of the provision of preventative counselling yet the degree to which these guidelines are complied with is unknown. The research examined how well physicians provide preventative advice in the domains of sexual and physical health, substance use and psychosocial health.

2.2 What Sociodemographic Factors of Adolescents Predict the Provision of Preventative Advice to Them?

There have been documented discrepancies in the comprehensiveness of preventative care based on such sociodemographic factors as age, education and religious affiliation (Wiggers and Sanson-Fisher, 1997). For example, individuals with lower educational attainment have been shown to receive less preventative advice from practitioners (Fiscella et al., 2002). In addition, Nova Scotia youth from lower socioeconomic status (SES) backgrounds are often at greater risk of engaging in high risk behaviours (Langille et al., 2003). In order to ensure that all adolescents have access to equitable, comprehensive preventative counselling, it is important to investigate the personal and behavioural characteristics which influence the provision of preventative advice to them.

2.3 Does Greater Need for Preventative Advice Predict Its Provision?

The association between youth's need for preventative counselling, as determined by their reported risk behaviours, and the provision of preventative advice to them was explored. Although GAPS recommendations are for preventative counselling to be delivered to all adolescents regardless of individual characteristics, when resources (i.e., time and money) are limited, adolescents with greater need should receive more comprehensive and consistent advice (AMA, 1997; Flay, 2002). This research question considered a subset of risk behaviours and factors which have considerable potential to impact on the health of adolescents.

2.4 How Does SBHC Access Predict the Provision of Preventative Advice?

Nova Scotia is a leader in the provision of school-based health services (Langille and Rigby, 2006). It is of critical value to document whether this mode of healthcare delivery has an effect on the amount of preventative counselling adolescents receive from physicians. It may be that adolescents practice health seeking behaviours more if a SBHC is present in their school; making the SBHC a vehicle that may augment the amount of preventative counselling that adolescents receive overall. These findings can in turn go on to inform policies related to the further implementation of SBHC in schools across the province and the country.

CHAPTER 3.0 BACKGROUND AND LITERATURE

The following section will examine the relevant literature on the kinds of health risk behaviours in which adolescents engage, the prevalence of these behaviours and the situation with respect to the Nova Scotian context. It will go on to explain preventative counselling, how it is delivered, the barriers to this type of counselling and will introduce school-based health centres as potential amplifiers to this type of counselling. Finally, it will provide an examination of the existing literature on the Guidelines for Adolescent Preventative Counselling(GAPS); how it is used a tool to ensure more comprehensive preventative counselling and how it is delivered. The background section will conclude with a discussion of what knowledge is lacking in terms of the delivery and barriers to preventative counselling in Nova Scotia, providing motivation for the proposed research project.

3.1 Adolescents Are At Risk

3.1.1 Adolescent Risk Behaviours

Adolescence is a particularly vulnerable time of an individual's life. In this time period there is an increased tendency towards substance use, risky sexual behaviour, criminal acts and risky automobile driving; these behaviours tend to begin in middle adolescence and peak in the early twenties (Reif and Elster, 1998; Arnett, 1999; Langille et al., 2008). A desire to experiment and test boundaries as well as feelings of invincibility can lead to their placing themselves in situations dangerous to their physical, sexual or mental health (Reif and Elster, 1998; Ellickson et al., 2005). Before they finish high school, approximately half of teens will have become sexually active, 25% of those will have contracted some type of STI and between 15-20% of girls will have become pregnant; they will also have experimented with substance use (73% drinking alcohol, 47% smoking cigarettes and 48% ever trying drugs); in addition, roughly one in two youth will have battled depression (5-8% qualifying for diagnosis of Major Depressive Disorder – DSM criteria) and one in three will have been confronted by violence (Neinstein et al.,

2008; Reif and Elster, 1998). Although the above data is American and some of it is dated, it begins to illustrate the potential for heath risks in this developmental phase. Not only are risk behaviours problematic in their own right but the presence of one type of risk behaviour has been shown to be linked with other risk behaviours (Blum et al., 2002, Flay 2002). For example, adolescents who report substance use problems are more likely to also report higher levels of risky sexual behaviour (Fortenberry, 1997; Santelli et al., 1998; Smith et al., 2008). In addition to the grave consequences of experimentation during the adolescent years – over three quarters of youth mortality can be attributed to high risk social and behavioural activities (Hedburg et al., 1998; Kaplan et al., 1998) – these health-compromising behaviours continue to have a significant impact on later health and well-being. Indeed, the health patterns established in youth have been shown to contribute to considerable morbidity and mortality when these youth move into adulthood and this can affect the likelihood of life successes (Ford et al., 1999; Blum et al., 2002; Brindis et al., 2003). For example, cigarette smoking initiated in adolescence may cause significant health problems, such as lung cancer, in later life (Blum et al., 2002; Flay, 2002; Klein and Matos, 2002). An acknowledgement of the influence of adolescent health on later adult morbidity has led researchers, policy makers and healthcare professionals alike to explore ways in which to target adolescents effectively; identifying risk behaviours and helping prevent youth from initiating and adopting them as habits (Kaplan et al., 1998; Blum et al., 2002).

Recognizing this as a tumultuous and vulnerable time for youth, both the government of Canada and Health Canada have individually pledged their support of programs aimed at improving the health of adolescents. In March 2007, the Federal Minister of Health appointed an Advisor on Healthy Children and Youth whose mandate it is to ensure that the federal government take the necessary steps to enhance the health of Canadian youth. In addition, Health Canada has made ensuring optimal health for Canadian adolescents a priority. A special sub-section of the Health Canada website is dedicated to outlining many of their strategies and suggestions for children and adolescents (Health Canada, 2008).

3.1.2 Risk Behaviours in the Nova Scotian Context

Research in Nova Scotia has shown that many adolescents are at risk for substance abuse, negative sexual health outcomes, unhealthy body image, and mental health concerns; outcomes which have been associated with negative health effects later in adult life (Starkes et al., 2005; Langille et al., 2003; Santor et al., 2006; Cook et al., 2007). The following section describes some of the literature related to the high risk behaviours of Nova Scotian adolescents.

Healthy Weight and Diet Risk Behaviours

At present, the prevalence of being overweight and obesity amongst youth in Nova Scotia is significantly higher than the Canadian average with 32% of youth being overweight or obese (CIHI, 2004). Cook et al. (2007) examined responses to an anonymous cross-sectional survey administered to adolescent girls in grades ten through twelve. The survey aimed to tease out girls' perceptions of weight and weight-control, and investigate associations between disordered perceptions of weight and the tendency to engage in other risky behaviours. The results showed that female adolescents in rural Nova Scotia who perceive themselves as overweight or underweight are at a greater risk of depression while girls who engage in disordered eating to control their weight are 4.2 times more likely to have suicidal thoughts and 1.6 times more likely to have become sexually initiated (Cook et al., 2007).

Sexual Risk Behaviours

High risk sexual behaviour has been observed in youth surveyed in Nova Scotia. In one study of thirteen to nineteen year olds who completed a self-report questionnaire about sexual behaviours in 1998, forty percent of sexually active students reported having had more than one partner in the last year (Langille et al., 2001). Poulin (2002) found similar results with one third of adolescents stating that they had more than one partner in the twelve months before the survey. In a more recent study of fifteen to nineteen year olds at four Nova Scotian high schools, Langille et al. (2005), found that half of the students had initiated sexual intercourse and 7% had had anal intercourse at least once. While adolescents are showing increased sexual initiation compared with earlier cohorts, only

thirty-five percent of them report having always used condoms (Langille et al., 1994; Langille et al., 2001; Poulin, 2002).

Substance Use Risk Behaviours

In 2007 a standardized survey was conducted in the Atlantic Provinces to determine the rates of substance use and gambling problems and the risk behaviours associated with them. The Student Drug Use Survey in the Atlantic Provinces was compiled from the responses of 17,545 students in grades seven, nine, ten and twelve from the four Maritime provinces. The report found that 15% of adolescents reported smoking cigarettes in the past year, 29% reported any use of cannabis, and that alcohol use presents the most widespread health risk for this population, with 51% of students reporting any use of alcohol and more than one quarter of adolescents reporting high risk (or binge) alcohol consumption. Although, overall, students reported a decreased prevalence of substance use (cigarettes, cannabis and other illicit drugs, no change in alcohol) compared with a similar survey carried out in 2002, among students who report having had sexual intercourse, over one third describe having had unplanned sexual intercourse while under the influence of either drugs or alcohol (Poulin and Elliott, 2007).

Mental and Physical Health Risk Behaviours

Many Nova Scotian adolescents are also at significant risk either by the hazardous health behaviours in which they engage or their mental health state. The Nova Scotia Student Drug Use Survey found driving while under the influence of a substance to still be common practice amongst adolescents in the province (Poulin, 2002). In a study examining the use of school-based health services, Santor et al. (2006) found that 64% of students who visited the health centre were experiencing mental health difficulties and 27% of these students were deemed significantly affected to be referred for treatment. Correspondingly, Starkes et al. (2005) found 7.3% of Atlantic Canadians (ages 12 to 65+) had experienced major depression in the last 12 months. With suicide having been identified as the third leading cause of death amongst youth aged fifteen to twenty-four (King, 2001), this high prevalence of depression could have serious consequences. In fact, in a study conducted with adolescents in Northern Nova Scotia, Wang et al. (2003)

found just under 20% prevalence of suicidal behaviours in the past year; with girls reporting more behaviours than boys but no gender difference in the number of suicide attempts. Despite this, only one-quarter of the individuals report receiving the mental health care recommended by established guidelines, indicating that these populations are underserved in terms of appropriate care (Starkes et al., 2005).

3.2 Preventative Counselling

3.2.1 What is Preventative Counselling?

Preventative counselling is based on the concept of screening; which can be understood as the evaluation and examination of an individual or specific group of people thought to be vulnerable to or at risk of a particular negative health outcome. It is typically performed using a simple algorithm that separates people more likely to have a health concern from those less likely to have one, the results of which inform the course of treatment for the individual (Stedman's Medical Dictionary, 28th Ed, 2006). Stevens (2006) defines preventative counselling as a treatment theory based on the idea that risk behaviours related to physical, mental, environmental and sexual health can be identified and targeted before they become consistent and engrained behaviours that may be long-standing and deleterious to health. Consequently, healthcare providers can use regular check-ups and annual visits as opportunities to identify and address physical, mental and social risks in their adolescent patients as well as their underlying causes, and help adolescents understand the consequences of their risk behaviours.

3.2.1.1 Why Preventative Counselling During Adolescence?

The intersection of a number of factors during adolescence provides an ideal opportunity to conduct health screening activities with youth. Arnett (1999) portrays adolescence as being a period of increased stress (compared to other developmental stages), characterized by conflict with parents, mood disruptions and risk behaviour. In their effort to distinguish themselves and form an identity, adolescents experiment with activities that challenge societal norms. When these behaviours become potentially dangerous to adolescents themselves, or to others, they are called risk behaviours.

Adolescents tend to engage in multiple risk behaviours concurrently and the combination of behaviours such as risky sexual encounters and substance use can place adolescents at increased risk for negative health outcomes (Botvin et al., 1995; Ford et al., 1999; Crosby and St. Lawrence, 2000; Ellickson et al., 2005). In their research on American school-based health promotion, Botvin et al. (1995), found that both categories of behaviours share a common cause. Adolescents who display substance use problems tend to have difficulty with social resistance; likewise those who engage in risky sexual behaviours may not have high self-efficacy with regard to safer sex negotiation (Botvin et al, 1995). This provides the rationale for addressing these behaviours with comparable intervention strategies (Botvin et al., 1995; Ellickson et al., 2005).

The literature highlights both associations of different risk behaviours with each other and links between certain key risk behaviours (Fortenberry, 1997; Santelli et al., 1998; Tapert et al., 2001; Flay, 2002; and Langille et al., 2008). In the paper entitled *Multiple Sexual Partners Among US Adolescents and Young Adults*, Santelli and colleagues (1998), identify having many sexual partners as a risk factor for STIs and teen pregnancy among young people in the U.S. aged 14-22 who participated in the 1992 Youth Risk Behaviour Survey. Their research then goes on to show the strong association between substance use and higher numbers of sexual partners; the proportion of adolescents reporting multiple partners more than tripled as alcohol and illicit drug use increased (Santelli et al., 1998). Similarly, Fortenberry (1997) found that adolescents who had three or more sexual partners in the past twelve months were less involved in health-promoting behaviours such as seat-belt use and more involved in health-risk behaviours such as illicit drug use. These results remained the same when adjusted for age, ethnicity and socioeconomic status (Fortenberry, 1997). In Canada, Poulin and Graham (2001) administered self-report questionnaires to 9997 students in grades nine, ten and twelve at schools in the four Atlantic Provinces during the 1998 school year. They found that having multiple sexual partners and inconsistently using condoms were associated with unplanned intercourse that resulted from substance use (Poulin and Graham, 2001).

Since health risk behaviours do not occur in a vacuum but are rather part of a risk continuum, it is important that preventative counselling be delivered in a comprehensive and linked manner. As illustrated above, engaging in one type of risk behaviour may influence adolescents' tendency to engage in other risk behaviours (Hedberg, 1998; Blum et al., 2002; Flay, 2002). This line of reasoning also extends to interactions between individuals' engaging in high risk behaviours and the influence that these behaviours have on their peers and the people with whom they interact. It can be illustrated by considering the far-reaching effect of substance use by an adolescent male. For instance, he may feel emboldened to pressure a young woman into sexual behaviours that she would not otherwise have considered, he may not be receptive to the idea of using protection, and/or he may engage in other high risk activities such as driving while under the influence (without a seat belt) which could not only endanger his life but those of passengers and others who are on the road.

Tackling the reasons behind adolescents' engagement in these behaviours and attempting to limit the prevalence of initiation of high risk activities overall is critical. Since the range of risk behaviours adolescents may expose themselves to is linked, targeting one without acknowledging the others is unlikely to have the desired effect (Tapert et al., 2001). As such, health protection and promotion officials and researchers often endorse preventative counselling campaigns which emphasize the joint consideration of health risk behaviours with the expectation that these will be more successful than initiatives that deal with them in isolation (Flay, 2002; Smith et al., 2008).

The association between the provision of preventative counselling and the incidence and prevalence of health risk behaviours among adolescents has been recently investigated. While a direct relationship has not been established, preventative counselling has been associated with lower rates of risky behaviours (Ozer et al., 2003). Some of the goals of preventative counselling include early identification of risk behaviours and encouragement of protective factors to promote healthy development, empowering adolescents and their parents with information on the risks they may encounter and how

to mitigate their impact, and offering vaccination against preventable infectious diseases (Elster and Levenberg, 1997).

3.2.2 Inconsistent Delivery of Preventative Advice

Despite the potential for reducing health risk behaviours resulting from the provision of preventative counselling and the acknowledgement that such behaviour change is beneficial for adolescents, there is evidence that the full range of preventative counselling and screening services available is not consistently being offered to adolescents (Bethell et al., 2001; Rand et al., 2005 and Ozer et al., 2005; Adams et al., 2009). This may be due to a variety of issues and barriers including access, availability of services and concerns that patient confidentiality may not always be adhered to (Irwin, 2005). In a study conducted from September 1996 to April 1997, paediatricians practicing in the California area were asked to fill out surveys detailing their provision of preventative advice to adolescents in their practice. Although the health care professionals who responded were consistent in screening adolescents for immunization status and physical health issues such as blood pressure, they provided preventative counselling well below recommended standards (Halpern-Felsher et al., 2000). In their study, "Don't Ask, They Won't Tell", Blum et al. (1996) examined how well health screening, using a comprehensive approach, was being provided in paediatric practice settings, family practice settings and teen health clinics in Minnesota. Charts of adolescents 13 to 17 years old were randomly selected for inclusion in the study (Blum et al., 1996). Age and gender, specifically being young and female, were seen to have a positive impact on the likelihood of appropriate screening but the most significant factor was the individual healthcare setting. While healthcare professionals working in the context of teen clinics (both in school and not in school) performed better than others, in no setting was screening being implemented at recommended levels (Blum et al., 1996).

Several approaches to evaluating the extent of preventative counselling delivered exist: physicians' reports may be used, as well as both caregiver and adolescent reports. Ma et al. (2005) investigated the likelihood of adolescents having received preventative care by examining physicians' visit reports for ambulatory care. Irwin et al. (2009) surveyed

caregivers to assess the level and content of preventative advice that was delivered to the adolescents in their care. Finally, Adams et al. (2009) advocate for a methodology which relies on self-report of service delivery by adolescents themselves. Despite their varied techniques, all three studies came to the same conclusions; that adolescents are consistently underserved in terms of preventative counselling and that what care is given is well below recommended guidelines. On a local level, there is very little concrete evidence on how well preventative efforts with respect to adolescents in Nova Scotia are being carried out. Viewing and evaluating preventative counselling through such an approach can help determine how effectively Nova Scotian adolescents' preventative counselling needs are being met.

3.2.3 Preventative Counselling Guidelines

A useful way to evaluate the quality and extent of provision of counselling and screening is through the lens of guidelines tailored to preventative counselling. This allows for the quantification of services provided and can help identify gaps in service provision. Moreover, clinicians often report discomfort with discussing certain sensitive topics, such as sexuality and substance use, with adolescents (Gance-Cleveland, 2003). Therefore, a standardized set of guidelines has been proposed as an ideal way to bring up these topics and increase early detection of health risk behaviours (Gadomski et al., 2003; Gance-Cleveland, 2003).

Several models/guidelines for preventative counselling have been created to ensure that services are delivered comprehensively. The American Medical Association's Guidelines for Adolescent Preventative Services (GAPS) is one of a series of models that have been developed to enhance the provision of preventative counselling; the Young Adult Health Care Survey (YAHCS) outlined in Bethell et al. (2001) and Bright Futures guidelines summarized by Green (1994) are some other examples.

Using tools such as guidelines to promote the appropriate and comprehensive provision of preventative counselling to adolescents has been the topic of many research studies and investigations (Montalto, 1998; Bethell et al., 2001; Ozer et al., 2005; Richmond et

al., 2006). Montalto (1998) gives an overview of a set of guidelines developed to encompass the necessary screening topics for adolescent health and explains how busy physicians make use of this as a tool to remind them to perform preventative counselling during the course of routine health care visits as well as identify youth who are in need of targeted advice. In Northern California a health systems intervention was implemented in the form of physician training on adolescent health risk screening and the integration of screening tools to facilitate such screening. Compared with the normal standard of care, Ozer et al. (2005) found that the delivery of adolescent preventative services and counselling improved significantly when such tools and training were applied. Similarly, when investigating the effect of the implementation of a set of guidelines for adolescent preventative care in five community health centres across the United States, Klein and colleagues (2001) found an overall positive effect including increased screening and receipt of preventative services. They went on to hypothesize that this would ultimately improve the quality of care being delivered to adolescents.

3.2.4 Predictors of Provision of Preventative Advice

Several studies have looked at the predictors of optimal provision of preventative services to adolescents; among the variables to emerge as potential predictors are patient factors such as age, ethnicity, socioeconomic status, religious affiliation and education, and systemic factors, such as accessibility of healthcare or the existence of school-based health services (Solberg et al., 1997; Wiggers and Sanson-Fisher, 1997; van Ryn and Burke, 2000; Fiscella et al., 2002). In a 2007 study by Klein and colleagues, being young, female and African American predicted the provision of preventative advice, as did having attended a school-based health centre. Interplay exists between sociodemographic characteristics, adolescent activities and risk behaviours, and the likelihood of healthcare providers targeting them for health promotion advice. Sociodemographic factors are both associated with an adolescent's engagement in risk behaviours and the provision of preventative advice to these individuals; a phenomenon which the literature demonstrates (Santelli et al., 2000; van Ryn and Burke, 2000; Fiscella et al., 2002; Langille et al., 2003, 2005).

Association of Sociodemographic Factors with Adolescent Risk Behaviours

Langille and colleagues have spent a considerable amount of time investigating the associations between SES and risk behaviours. Although in their 2002 study of contraceptive use amongst female adolescents in rural Nova Scotia, Langille et al. found that young women were reporting more consistent contraceptive use than in other national studies, they also discovered an association of low paternal educational achievement with not using effective contraception. In a later study, Langille et al. (2003) found that whether an adolescent lived in a dual parent household or not had an effect on their substance use patterns; with adolescents living with only their mother being 1.8 times more likely to have smoked marijuana more than ten times in the past month. Santelli et al. (2000) also found similar results when they assessed the relation between SES and sexual risk behaviours; their data demonstrated that living in a two-parent household and greater parental education were independently associated with delayed sexual initiation. The importance of considering such factors when creating targeted interventions should not be ignored (Langille et al., 2003, 2005).

Association of Sociodemographic Factors with the Provision of Preventative Advice

Socioeconomic status (SES) and other sociodemographic factors can have a significant impact on physician's perception of patients' healthcare needs and self-efficacy (van Ryn and Burke, 2000). This, in turn, may influence their provision of preventative health counselling. If associations exist between sociodemographic characteristics and the provision of advice then it can be shown that certain groups are at increased risk for not being provided adequate preventative services. Health protection and promotion programs could use these results to help inform the design of health education programs. In their analysis of survey data representing 842 patient encounters in ten New York State hospitals, van Ryn and Burke (2000) found significant support for their hypothesis that patients' socio-demographic characteristics affected how physicians perceived them. Physicians tended to perceive African Americans and individuals from low SES groups more negatively than Whites or upper SES patients, influencing their beliefs about such patients' abilities to adhere to medical recommendations. The researchers highlight that these preconceived ideas could have implications for the quality of care patients receive

(van Ryn and Burke, 2000). This trend further demonstrates itself when we consider SES, the resultant income gradient and adolescents' access to appropriate care. In considering this relationship, researchers using two national surveys found that American adolescents from a low SES background were less likely (up to seven times) than adolescents with middle and high SES to have their healthcare needs met (Newacheck et al., 2003; Irwin et al., 2009).

With respect to preventative care specifically, Fiscella and colleagues (2002) used years of education as a measure of SES and looked at the related delivery of preventative services. After directly observing physician/patient interactions in 84 practices across north-eastern Ohio, the researchers concluded that having a high school education or less predicted receiving lower rates of screening tests. Conversely, in their study of the association between patients' educational and occupational status and being offered preventative advice, Wiggers and Sanson-Fisher (1997) found no significant differences between high and low SES patient groups in the comprehensiveness of preventative care services. Likewise, Solberg et al. (1997) found that amongst patients surveyed from 22 clinics in the Minneapolis region, low-SES patients received needed preventative recommendations at the same rate as high-SES patients. The research examining the effect of SES on the receipt of preventative services by adolescents in particular has been rather limited and often inconclusive (Adams et al., 2009; Irwin et al., 2009). Although Rand et al. (2005) found disparities between the physical health preventative counselling delivered to black and white adolescents; with physicians less often reporting having counselled black youth on the benefits of exercise; there were no significant differences in the delivery of preventative advice for any other topics.

In addition to these predictors, there are also individual characteristics of both the patients and providers that can influence the provision of care. One challenge of providing adolescents with needed care is that they will likely not seek it out alone (Klein and Wilson, 2002; Irwin, 2005). Physicians have had to rely on high risk adolescents having sufficient self-awareness to advocate on their own behalf for the services and care they need; something those at risk often may not do due to various concerns including those of

confidentiality (Ford et al., 1999; Bethell et al., 2001; Langille et al., 2008). Specific access to preventative services may be improved by motivating for the inclusion of preventative counselling in all healthcare visits, even acute ones (Bethell et al., 2001). This is centred on the idea that every clinical encounter should be an opportunity to guide and advise adolescents towards more health promoting activities; irrespective of whether adolescents take the initiative to report risky behaviours or not (Oscos-Sanchez et al., 2008). By employing a framework to their preventative counselling, physicians partially take the burden of responsibility of health seeking behaviours off the adolescents (Bethell et al., 2001). Ideally, the application of guidelines should help to ensure that preventative care services are delivered in an objective manner; that all individuals get access to the same counselling regardless of risk status or individual characteristics. As a result the ideal outcome of such preventative counselling would be the earlier and more comprehensive identification of risk behaviours and promotion of preventative health actions (Ford et al., 1999; Low 2003).

3.2.5 Failure to Account for These Barriers Places Adolescents at Higher Risk

As mentioned earlier, despite consensus on the usefulness of preventative counselling guidelines for helping improve the extent and comprehensiveness of preventative counselling by health care providers, these are not always well adhered to, and provision can vary by service site (Blum et al., 1996; Goodwin et al., 1999; Beebe et al., 2006). Even though adolescents are at risk of negative health outcomes and preventative health services exist to encourage health promoting behaviours, there are a number of individual and systemic factors which may influence adolescents to forego accessing needed healthcare (Elliott and Larson, 2004). There is a significant degree of foregone care in adolescent populations, to the extent that every year 1 in 5 adolescents report not feeling properly supported with their healthcare needs (Ford et al., 1999; Elliott and Larson, 2004). Ford et al. (1999) conducted at home interviews with 20,746 adolescents in grades seven to twelve. These interviews were designed to elicit information on the extent of and factors behind foregone healthcare amongst U.S. adolescents. They reported significant levels of foregone care and suggested that, as a result, these adolescents are at increased risk for mental and physical health problems (Ford et al.,

1999). In their study of tenth-grade students in rural communities in the Mid-Western United States, Elliot and Larson (2004) found that nearly half of adolescents, aged 15 to 17 years, reported having foregone needed care. In follow-up focus groups, barriers to receiving care were identified by the youth. Among the most prominent were: cost of care, lack of transport to healthcare facilities and stigma, but also, lack of knowledge of where to access appropriate care for STIs and substance use. It is interesting to note that the adolescents most likely to report foregone care were also those who reported being engaged in high risk activities (Elliot and Larson, 2004). These adolescents are then at higher risk of engaging in behaviours which could be harmful to their physical, sexual or mental health.

3.2.6 Does Need for Preventative Counselling Predict its Provision?

One central area of health services research is whether need for services predicts use; however, it is also of critical importance to investigate the role of need for preventative services on the provision of such counselling and advice. Further to the research mentioned above, it can be seen that all adolescents should receive preventative advice; in fact one of the objectives of preventative counselling guidelines is to provide these services in an objective and comprehensive manner. Despite this, it can be argued that when resources are limited adolescents who report risk behaviours have a greater need for counselling and should perhaps receive targeted and comprehensive preventative counselling in order to mitigate the effect of these risk behaviours (Zimmer-Gembeck et al., 1997; Coyne-Beasley et al., 2003; Langille and Rigby, 2006).

Currently, in Nova Scotia, approximately half of adolescents are sexually active, one third report having multiple partners and only 35% of them use condoms consistently; alcohol is consumed in high risk amounts by over one quarter of students; and approximately 20% of students report suicidal behaviours (Langille et al., 2001; Poulin, 2002; Wang et al., 2003; Poulin and Elliott, 2007). Certainly, Nova Scotian adolescents engage in risk behaviours which put them in need of appropriate and timely care and if these behaviours are targeted earlier on, the burden of illness may be decreased.

Both long and short term public health consequences may be mitigated by ensuring that adolescents who qualify as being in need, due to the fact that they consistently engage in high risk health behaviours, receive appropriate comprehensive preventative counselling (Ozer et al., 2003). While it cannot not be argued that the focus of services should be on those in need, health counselling is certainly more beneficial if delivered in a preventative manner; before individuals put themselves at risk by virtue of the behaviours which they engage in. In addition, it may be, especially in the case of male adolescents, that traditional preventative counselling services are not engaging adolescents or perhaps do not adequately address their needs (Greene and Biddlecom, 2000).

3.2.7 School-Based Health Centres

During the critical years of adolescence, youth spend the majority of their time in school. In response to this, apart from traditional settings, adolescents may also get access to healthcare services and information at school-based health centres (Klein et al., 2007). School-Based Health Centres (SBHCs) were developed in the early 1970s in response to studies which consistently showed that education and health could be linked and that schools were an excellent location for providing preventative counselling (Kirby, 2002; Langille et al., 2008 and Smith et al., 2008). Schools provide an ideal setting for preventative health programs since young people are assembled together in an environment that is conducive to learning and where they are primed to absorb information (Kirby, 2002). Students are more open and comfortable with learning sensitive health related information because preventative counseling models fit the same paradigm of instruction in schools (Botvin et al., 1995; Health Canada, 2003; Kirby, 2002). SBHCs are rooted in the philosophy of ensuring equitable and appropriate access to health care for youth across the socioeconomic spectrum; in fact they arose out of an American Academy of Paediatrics initiative called the Community Access to Child Health (CATCH) program (Anglin et al., 1996; Friedrich et al., 1999; Gustafson, 2005).

Klein et al. (2007) found that having attended a school-based health centre was predictive of receiving more comprehensive preventative counseling from a clinician at a later time. Similarly, Santor et al. (2006) has discussed how the true strength of SBHCs may lie in

their ability to help facilitate the detection of previously undetected problems as opposed to preventing the onset of risk behaviours. In order for the true value of SBHCs to be attained, the centres must ensure that their services successfully reach students.

Nova Scotian Context

Nova Scotia is a leader in Canada in providing school-based health services. The oldest SBHC in the province was started in 1991; it is located at J.L. Ilsley High School and is called the Teen Health Centre. Designed to address factors which might act as obstacles to adolescents seeking health services, Nova Scotia has a network of about forty-one school-based and school-linked youth health services, 37 of which are located in schools (Langille and Rigby, 2006; NSDHPP, 2009). Services at a SBHC may be targeted to address one specific set of risk behaviours (e.g., sexual experimentation resulting in teenage pregnancy) or they may be more comprehensive, viewing adolescent health holistically. Nova Scotia has a wide range of models. Some of the services and supports offered at SBHCs are health promotion and education, information and referral, and follow-up. In 2002, the Department of Health of Nova Scotia undertook to study the impact and effectiveness of SBHCs in the province. They wanted to determine the linkages between SBHCs and how well they are meeting youth-related standards and targets as outlined in the 1997 Nova Scotia Health Standards (Collins Management Consulting and Research Ltd. 2002). In this vein, Santor et al. (2006) conducted a longitudinal study of adolescents in grades seven through twelve. They found students used SBHCs mostly for help with emotional problems, with students identifying an emotional issue as their primary reason for visiting the centre 70% of the time. They also listed mental health problems (46%), educational information (19%), physical health problems (12%) and social difficulties (5%) as other reasons for having attended the centre. However, the researchers went on to conclude that SBHCs were not being used optimally; although a small number of students used the health centre services frequently, a large percentage of students did not utilize the services provided. Similarly, while investigating the relationship between SBHC use and risk behaviours reported by students in Cape Breton, Nova Scotia, Langille et al. (2008), reported that a large portion of students at risk did not use SBHC services.

There exists a clear need for Canadian research into the use of SBHCs and to date there has been little further research in the Nova Scotian context (Langille and Rigby, 2006, NSDHPP, 2009). It remains to be determined whether adolescents with access to SBHCs in Nova Scotia receive more preventative counselling than those without access.

3.2.7.1 Are SBHCs Associated with Greater Access to Preventative Counselling?

SBHCs have experienced a growing popularity in the last two decades; the importance of preventative counselling being provided at these centres is referenced again and again (Kaplan et al., 1998; Friedrich et al., 1999). SBHCs were originally developed and implemented in urban areas but as their scope has increased and the evidence for their positive impact has grown, they have begun to provide services in schools in suburban and rural communities. While SBHCs do not replace the need to visit other healthcare facilities, they can have an influence on the use of health care and overall access to care (Santelli et al., 1996). Kisker and Brown (1996) compared health outcomes in students with and without access to SBHCs. They found that the presence of a health centre within the school significantly increased the likelihood of adolescents visiting a health care provider outside of the school setting. They also found a protective effect of access to SBHCs on the number of students reporting health risk behaviours (Kisker and Brown, 1996). Consistent with other studies (e.g. Kisker and Brown, 1996 and Klein et al., 2007), Kaplan et al. (1998), found that not only did presence of a SBHC increase screening rates for high risk behaviours but adolescents who had access to SBHC services were 86% more likely than students without access to have at least one comprehensive well-care visit with a healthcare professional in a primary care setting other than the SBHC. Using GAPS as a standard to assess the provision of preventative counselling, Blum et al. (1996) found that SBHCs performed better than any other health facility. Not only did access to a SBHC increase the chance of youth receiving screening for high risk activities, but the presence of SBHCs was also seen to reduce barriers to access of other health services; such as those for physical or mental health (Kaplan et al., 1998). This is a promising finding given the mandate of SBHCs to speak directly to issues of access. The issue of access is especially pertinent for the United States where universal healthcare does not exist. In Canada, although the problem of access is framed differently there are

still a number of barriers to adolescents receiving regular, appropriate healthcare. Therefore, due to the convenience and proximity of care being offered in schools, SBHC have been proposed as an important initiative in Canada as well (Blum et al. 1996; Gustafson, 2005; Langille and Rigby, 2006; Langille et al., 2008).

3.3 Guidelines for Adolescent Preventative Services (GAPS)

3.3.1 Introduction to the Guidelines

Bethell et al. (2001) have recommended developing a way to quantify, in a reliable and valid manner, how well physicians adhere to guidelines for adolescent preventative services. In response to this, as well as many other study findings, the AMA has created an approach which provides healthcare professionals with advice about which risks to address in providing prevention counselling to their adolescent clients and a systematic method of assuring that this preventative health advice is provided. This approach is grounded in the empirical literature and is known as the Guidelines for Adolescent Preventative Services (GAPS). It provides a framework for the organization and content of preventative health services. This framework can be used to help evaluate whether youth are getting appropriate and comprehensive preventative counselling (Ozer et al., 2005; Langille et al., 2008). The guidelines have 24 recommendations to be used in practice and strongly advise that youth and young adults between the ages of 11 and 21 attend annual visits with a healthcare professional (Blum et al., 1996; Reif and Elster, 1998), during which specific inquiries should be made about health risk behaviours, and where warranted, preventative counselling provided.

GAPS addresses a range of behavioural health domains including the prevention of the use and abuse of tobacco, alcohol and other drugs; the prevention of physical, sexual or emotional abuse; the prevention of mental health issues and suicide; and, the prevention of negative sexual health outcomes. Health promotion recommendations include the promotion of healthy diet to combat obesity and eating disorders; injury prevention; physical fitness; healthy psychosexual adjustment; and, the promotion of adjustment to puberty and adolescence (AMA, 1997). The guidelines, which were developed with

support from the Centers for Disease Control and Prevention, have the ultimate goal of changing the way in which adolescent health services are delivered. The outcome of their effective implementation should be the improved health of adolescents through primary and secondary prevention of major health threats to youth (Montalto, 1998).

3.3.2 Setting GAPS as the Standard

Introducing GAPS as a guideline in adolescent care facilities has the potential to improve both the quality and comprehensiveness of the preventative advice provided to adolescents; helping to identify risk behaviours and arm adolescents with the information necessary to make healthier choices (Klein et al., 2001). In concert with many similar studies, Brey and Epner (1997) found that when GAPS was incorporated into clinical preventative services within high risk middle and high schools in both rural and urban areas of three states in the U.S., both delivery and quality of care improved. Blum et al. (1996) outline the importance of using a preventative service guideline, such as GAPS, and they go on to show that the effective implementation of GAPS increases with patients age, patient's gender (females receive more) and provider's exposure to more high risk adolescents. According to Sells and Blum (1996), the main health risk behaviours that American adolescents engage in are reckless driving resulting in motor vehicle collisions and deaths, substance use, including binge drinking and illicit drug use, unprotected sex, suicidal behaviours, and poor nutritional habits resulting in being overweight or obese (Sells and Blum, 1996). The early identification of these risk behaviours and the provision of accessible and youth friendly services designed to limit their impact is essential to the healthy development of adolescents. As such, it is recommended that adolescents receive preventative counselling on the above topics on a yearly basis (Irwin et al., 2005). To indicate their support of the GAPS approach, the Canadian Paediatric Society has recommended its implementation as a guideline for the provision of preventative counselling to adolescents throughout the country (Canadian Family Physician, 2008).

3.3.3 Gender Differences in the Provision of Preventative Counselling

Cultural norms have long dictated that girls or women be the individuals responsible for health and health promotion. However, it should be acknowledged that since the risk behaviours that female adolescents engage in are often linked to those of their male peers, both groups should be targeted with preventative counselling. This counselling can then be tailored to their needs with respect to their gender and individual characteristics. A case in point is with condom use; while it is vital to help inform and empower girls on their sexuality and reproductive health, if the girls' male partners have not also been sensitized to the importance of using condoms, they may not agree to wear protection. This may have the effect of putting girls in a situation where they may choose not to insist upon condom use in order to avoid an awkward situation (Marcell et al., 2002). Notwithstanding this argument, it has been shown that medical professionals are more likely to talk to girls about issues surrounding sexuality and that similarly, girls are most likely to access health care for issues related to sexuality and mental health (Langille et al., 2001). On the other hand, boys are more likely to seek out health care advice for issues related to substance use and at the same time, health professionals are more likely to provide this kind of advice and counselling to boys (Keyl et al., 1996; Langille et al., 2001). To summarize, not only do female and male adolescents have different needs with respect to their preventative counselling needs, there are also gender differences in the provision of preventative advice. In order to flesh out these dual phenomena studies that stratify their analyses of provision of preventative services by gender are required.

3.3.4 The Gap in Knowledge about Preventative Services Provided to Nova Scotian Youth

Although in Nova Scotia, there are no major difficulties with access to primary health care for adolescents, it is unknown whether or not adolescents are being provided preventative health counselling when they visit primary healthcare settings. Recent research has shown that 80% of adolescent females and 60% of adolescent males report visits to a primary care physician in the previous year (NSYOUTH Research Team, 2006). It has also been shown that adolescents are willing to be given preventative advice and that they trust the information given by healthcare providers (Steiner and Gest, 1996; Zimmer-Gembeck et al., 1997; Bethell et al., 2001; Klein and Wilson, 2002).

Factors associated with adolescents being willing to discuss such information include being assured of confidentiality in their conversations with the healthcare provider, having made several consecutive trips to the health professional's clinic and having the healthcare professional broach the topics initially. Adolescents may be exposed to new ideas and activities as well as to peer pressure and they may wish to discuss risk behaviours with their healthcare provider as someone they can trust to provide neutral advice and accurate and appropriate information (Klein et al., 2007; Langille et al., 2008). This preventative advice can be administered by school nurses, clinicians, family doctors or counselors (Levenberg, 1998; Montalto, 1998). To date there has been very little research using a model such as GAPS to assess the extent of provision of preventative health counselling (Langille et al., 2001). Fleming and Brey (1996), and, Brey and Epner (1997) have each proposed school-based health centres as ideal locations for implementing and integrating GAPS with the goal of improving the quality and overall delivery of preventative services. Since the development and release of GAPS, in 1992, it has been implemented numerous times to assess the degree to which comprehensive health screening is being delivered to adolescents in the clinical setting (Blum et al., 1996; Brey and Epner, 1997; Klein et al., 2001).

Even though adolescent experimentation is part of healthy development, the consequences of these activities may make young adults more vulnerable to negative health outcomes (Reif and Elster, 1998; IPPF, 2001; Wyatt et al., 2005). It is essential to investigate how well preventative counselling is being delivered by physicians, what factors are acting as barriers to the comprehensive delivery of preventative counselling by these healthcare providers and what effect the presence of a SBHC has on the delivery of preventative advice and counselling by physicians.

CHAPTER 4.0 METHODS

4.1 Survey

Data for this study was collected from two school-based health surveys conducted in Nova Scotia in 2003 and 2006. The two surveys contained nearly identical questions on respondent sociodemographics and health risk behaviours, and about the preventative advice and services provided them, based on the GAPS approach. Both surveys were administered as census questionnaires on health service provision. The first survey, carried out in 2003 was called the "The Adolescents and Health Related Services Research study" (AHRSR) and it was administered to 2277 adolescents in grades 9 to 12 at four high schools in Cumberland, Colchester and Pictou counties. The second survey, the "Cape Breton Health Service Evaluation Study" (CBHSE), was administered in 2006 to 1629 students of the same age range at three high schools in industrial Cape Breton. The AHRSR contains data from two schools that did not have school-based health centres. Both surveys reached a high percentage of the student population in the schools involved and in total 3906 students completed the survey questionnaires (90% of students present on the day of the survey). The two cross-sectional datasets described above were cleansed and appended to create the dataset examined in the current research.

4.2 Participants

Survey participants were relatively equally distributed by gender, age, and grade level making for a comprehensive and representative sample. The gender split was even (49.8% males vs. 50.2% females); and slightly more older students (aged 17, 18 and 19) than younger students (aged 15 and 16) completed the questionnaires (55.5% vs. 44.5% respectively).

4.3 Funding and Ethics

Funding for this research project was obtained from a Nova Scotia Health Research Foundation's (NSHRF) Student Research Award. Ethics approval was obtained from the Dalhousie University Health Sciences Research Ethics Board on August 19th, 2009.

4.4 Setting

The surveys were administered in high schools in two regions of Nova Scotia – Cumberland, Colchester and Pictou counties, and industrial Cape Breton County. Although these relatively rural areas demonstrate some homogeneous demographic characteristics, it is worth noting that the regions also show heterogeneous distributions of socioeconomic status, living costs and employment statistics. For purposes of comparison and to familiarize the reader with the regions, a table outlining selected demographics for each region can be found in the appendices (Appendix I). A brief exploration and discussion of the relevant differences between each county follows. The statistics given for each of the counties are taken from the Community Profiles compiled from the Statistics Canada census conducted most recently before the survey was conducted in each county. Therefore, the statistics for Cumberland, Colchester and Pictou counties are taken from the 2001 census and the data from Cape Breton County has been pulled from Statistics Canada's 2006 Census (with the exception of the education statistics which were taken from the 2001 Census to maintain consistency between age categories).

Overall, Colchester County has the highest SES levels with the highest median household income and the lowest unemployment rate. Although Pictou County has low percentages of people with less than a high school graduation certificate, the unemployment rate (15%) is higher than in Cumberland and Colchester counties, and higher than the national average.

Cape Breton County is the largest of the surveyed areas with a total population of 109,330 and, unlike the other counties, it has a higher proportion of Catholics compared to Protestants, although these two are still the two dominant religions. There is a larger percent of unmarried people in this region compared both with the province of Nova Scotia and the three other counties. Compared to the other counties, Cape Breton County tends to be underemployed (19.7%), reporting an unemployment rate that is almost 10% higher than Colchester County and significantly higher than the rest of the province.

4.5 Data

4.5.1 Data Collection and Cleansing

This research project is a secondary analysis of data gathered during two school-based surveys administered in 2003 and 2006. The questionnaires collected self-report data on a number of different adolescent health related topics and they were administered by trained research staff from Dalhousie University. Each of the students registered at the school was encouraged to participate and the response rate of students present on the day of the survey was high (90%).

Since the two original surveys were phrased slightly differently, it was essential to spend time ensuring that the variables from the two datasets could be appended without changing the meaning behind the coding. Changes were recorded in a new codebook (see Appendix III) to represent the final appended dataset. During the course of data cleansing 174 respondents were dropped from the final dataset (N=3906 to N=3732).

4.5.2 Data Measurement

In order to determine the extent of preventative counselling and factors influencing the delivery of this type of adolescent healthcare, the research project employs variables that have been created using the questions included in both questionnaires. Since these survey instruments contain only measures which have been standardised and thoroughly tested, the measures are in keeping with the present state of knowledge on these research topics. Previous studies have been investigated to select the best practice measures needed to elicit valid results. When developing the questionnaires, the researchers took great care in selecting questions that had psychometric value for adolescents. The risk behaviour questions and socioeconomic status variables demonstrate good test-retest reliability (explained below). It is important to note that many of the measures were gathered using self-report. As a result, much of the data that emerges from the two surveys represents subjective measures of risk taking and counselling received.

Measures of age were represented in two ways; 1) continuously from age 15-19, and 2) dichotomized into younger adolescents (15 and 16 years old) and older adolescents (17,

18 and 19 years old). Being sexually active was determined by responses to the question: "Have you ever had vaginal sex?" and education is represented by school performance (or "average mark in school last year") which has been divided categorically into "Low" (less than 70%), "Middle" (70-79%) and "High" (80% and above).

Sociodemographic variables were created in order to address the research questions. Parental education and employment were both represented as dichotomous variables; "high school or less" vs. "post secondary" and "employed" vs. "unemployed" respectively. Students' perceptions of how well-off their families are compared with others have been categorized into "Well-off", "Average" and "Not well-off". There were two dichotomous variables related to religion which look at students' religious attendance and the importance they placed on religion. Finally, students' living situation was captured in three categories; "living with both parents", "living with mother only" and "having another arrangement" (living with either parent and a step-parent).

Whether preventative health advice was received or not (from any physician) was represented as a dichotomous variable. Likewise, receipt of advice by domain was also indicated by dichotomous variables. Finally, a continuous variable of "Score" was constructed to account for the provision of preventative health advice overall.

Stata compares the higher values to the lower values for dichotomous variables but for categorical outcomes dummy variables must be created and the reference category must be set. For these analyses the referent category was set as the value which represented the higher SES response. It should be noted that in some cases this required reporting the inverse of how Stata presented the results (1/value given).

A definition of need was created for each domain: for the physical health domain this was comprised of "trying to lose or gain weight", and for the sexual health domain this was "ever having vaginal sex". For the substance use domain, need was defined using the answers to three questions: 1) having had more than five drinks in a row more than once in the past thirty days (i.e., binge drinking), 2) being a current smoker (one or more

cigarettes in the past month) and 3) being a current marijuana user (using one or more times in the past month). Finally, for the psychosocial health domain, being "in need" was determined by being at risk for depression. A twenty item scale, the Centre for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) was used to evaluate students' risk of depression. Total scores of greater than 22 for males and greater than 24 for females were used to classify the individual as 'at risk for depression'.

A student only had to report having one substance use risk behaviour to be included in the "in need" group and in turn only needed to have received preventative health advice on one topic in that domain of health advice to be deemed to have been provided advice. The hypothesis is that if a student had engaged in a risk behaviour associated with that health domain then they were in greater need of preventative counselling than a student who had not engaged in the risk behaviour.

The Guidelines for Adolescent Preventative Services (GAPS) were chosen as the preventative counselling guidelines standard as they have been demonstrated to help improve healthcare professionals' compliance with preventative service provision to adolescents. As such, in this research project, GAPS was used as a model to assess the comprehensiveness and breadth of adolescent preventative services (Levenberg, 1998; Gadomski et al., 2003; Low, 2003).

In order for preventative counselling from healthcare providers to be comprehensively delivered in accordance with GAPS, it must touch on each of the domains and topics presented in the table in Appendix II. The original twenty-four recommendations outlined by GAPS were reduced to sixteen for use in the survey due to length concerns. For the purposes of this research project the GAPS domains above have been categorized into the domains of physical health, sexual health, substance use and psychosocial health and each of the sixteen preventative health advice topics which physicians are recommended to provide to adolescents were divided up into the four domains along thematic lines.

These domains and the sixteen behavioural health topics encompassed within them were incorporated into the questionnaires given to students by asking them if they had received preventative advice on the sixteen distinct topics specified by GAPS. Prior to their inclusion in the survey, test-retests were conducted on each of the behavioural health questions to examine the percent agreement between the Yes/No responses. This was done to ascertain the reliability of the measures. All Cohen's Kappas were above .6.

These measures are presented in a table (Appendix III) which shows how each of the health domains specified by GAPS maps back onto the broader categories of health advice and then each of the corresponding domains created for the questionnaires. The four survey domains list the topics covered in each of them and are then followed by the actual questions asked of the adolescents who completed the survey.

4.5.3 Data Analysis

The two datasets described above were pooled for all analyses. Both descriptive (chi-square, means, proportions) and multivariate (unadjusted and adjusted regression) analysis were performed. Potential confounders (e.g. age) were adjusted for in all regression models. All data was analysed using the Stata software package (StataCorp LP, USA, version 10).

Analyses were stratified by gender to account for the unique pathways by which young males and females are involved in, experience, and seek help for, risky health-related behaviour. Previous studies have shown a gender difference in the provision of preventative advice for males and females; with females receiving the majority of advice on sexual health related topics and males receiving mostly substance use or physical risk preventative advice (Langille et al., 2001). At the same time, female and male adolescents have different needs with respect to preventative health counselling.

Research Question One:

To What Extent Do Youth Receive Preventative Advice From Physicians in Accordance With GAPS in Specific Health Related Areas?

This research question was addressed with descriptive analyses which examined the receipt of preventative counselling from a physician. Initially, the extent of preventative health advice on each of the 16 GAPS topics represented in the questionnaire was determined. The analysis considered each preventative health topic individually and assessed what proportion of adolescents reported receiving preventative counselling on each issue. This was calculated first for advice received from family doctors, then from other doctors and finally from any doctor. Other analyses included examining the extent of preventative counselling not received by topic. All analyses were conducted by gender and age category. Differences in proportions and means were assessed using chi-square statistics and t-tests respectively.

Approaches to Research Questions Two to Four

An initial, exploratory data analysis of the remaining three research questions showed that these might be more intuitively addressed and answered by combining their analyses together. To begin, the analysis for Research Question Two was split to consider both advice received overall and advice received by domain. The association of sociodemographic characteristics with the receipt of advice overall was analysed using a score variable and Poisson regression. Then the remaining three research questions were conducted by investigating the association of sociodemographic characteristics with the receipt of advice by domain. The first model (Model 1) was created for each domain and for each gender examining associations of being provided advice adjusted for all sociodemographic variables, using backwards stepwise logistic regression. The second model (Model 2) for each domain and gender was created by using all the original sociodemographic variables used previously and forcing the variable of being in need of advice in that domain into the analysis. Finally, all the sociodemographic variables were again put into a model and adjusted for by the presence of a school-based health centre, creating a third model (Model 3) for each domain and for each gender. As above, the

variable of need was forced into Model 3 along with the variable SBHC. Each of these analyses is described in detail below.

RQ2 a) – Analysis of the Association of Sociodemographic Characteristics with Higher Scores for Overall Preventative Topics Addressed

This research question examines what sociodemographic variables best predict how well youth do overall in the receipt of comprehensive preventative counseling from physicians. A score of 0-16 preventative health advice topics provided by physicians was created. Initially a linear regression analysis was planned; however, upon examining a histogram representation of the score variable's distribution, Poisson regression was deemed more appropriate. Poisson regression is used as a means to capture count data and it reports relative risks not odds ratios. Unadjusted Poisson regression analysis was performed on all independent variables to look at the relative influence of sociodemographic variables on the extent of services provided (Score of 0-16). Backwards stepwise regression was carried out, eliminating variables that failed to achieve significance ($p>0.10$), until the most salient factors were identified. Once the final model was obtained an adjusted Poisson regression was run and relative risks were reported for the significant variables.

Dependent Variable

The dependent variable in the Poisson regressions was the extent of preventative counselling provided by physicians, represented as a score variable (0-16).

Independent Variables

The independent variables were individual and sociodemographic characteristics which include measures that capture adolescents' age, school performance, religious affiliation and attendance and socioeconomic status. Socioeconomic status was estimated by using the proxies of parents' education level, parents' employment status, single or dual parent family, and family income; all of which have been seen to have acceptable test retest reliability.

RQ2 b), RQ3 and RQ4 – Associations of Sociodemographic Characteristics, Need and the Presence of School-Based Health Centres on the Provision of Preventative Advice by Domain.

In order to explore the provision of advice by domain these areas were created by collapsing health topics (e.g. the physical health advice domain consists of having been asked about any of the physical health topics – exercise, healthy diet or healthy weight). The four domains were those of physical, sexual, substance use and psychosocial health.

Model 1

The association of independent sociodemographic variables with the receipt of advice in each domain was analyzed using logistic regression. Unadjusted regression models were analyzed and backwards stepwise regression was performed using $p > 0.10$ as the criteria for removal of variables from the model. Following this, adjusted logistic regression models (Model 1s) further examined the sociodemographic characteristics which were significant in the backwards stepwise regression models. Using this method, the variables most likely to predict having received preventative counselling in each domain were identified.

Model 2

This research question explored the phenomenon of whether greater need for preventative advice predicts its provision. Being in need was defined as "ever having done" a health behaviour or, in the case of substance use, being a "current" user, and these behaviours were identified for each domain of preventative counselling. Here the backwards stepwise regression analysis was repeated using all the sociodemographic variables and adding the variable of need. By forcing need into the model, it remained ineligible for removal during the backwards stepwise regression. Once a final Model 2 had been established for each domain and gender, adjusted logistic regression analyses were performed examining whether or not need modified the association of sociodemographic variables with the provision of advice.

The initial analysis entailed looking at whether self-report of health risk behaviours is associated with increased levels of provision of preventative counselling; essentially whether or not there is an association between being "in need", as defined by reporting a risk behaviour, and receiving preventative counselling on that risk behaviour.

A further descriptive analysis was conducted to examine the straightforward effect of need on the provision of preventative advice in each domain. This analysis was performed by gender and the aim was to determine what effect being in need had on the provision of advice by physicians.

Model 3

This analysis investigated whether better physician performance with respect to the delivery of preventative counselling is associated with the presence of a SBHC in high schools. The likelihood of students receiving preventative counselling in schools with SBHCs and those without SBHCs (two schools) was compared. Each respondent was assigned either an 'access' or 'no access' variable. By assuming a general educational effect of presence of SBHC it may be that the presence of a SBHC is an amplifier of the potential for doctors to conduct comprehensive preventative counselling; students may receive information at a SBHC that leads them to engage in health seeking behaviours while in a doctor's appointment.

A model was built that included all the original sociodemographic variables and forced the retention of the need and access to a SBHC variables. Backwards stepwise regression analyses were performed, eliminating non-significant variables ($p>0.10$) and resulting in the creation of a final Model 3 for each domain and each gender. Multiple logistic regressions were run to examine the effect of presence of a SBHC on the remaining sociodemographic variables and need. A descriptive analysis was also conducted to determine the proportions of students receiving preventative advice from a physician on the 16 GAPS topics for schools with SBHCs and those without.

Dependent Variable

For each of the three Models, the dependent variable was the dichotomous result of Yes/No for having received preventative health advice in each of the domains (physical, sexual, substance use and psychosocial health).

Independent Variables

The independent variables were the same individual and sociodemographic characteristics used in the previous research question (Model 1) as well as need (Model 2) and presence of a SBHC (Model 3). The independent variable of being "in need" of advice was explained above and is defined by the answers to the questions represented in Appendix IV.

CHAPTER 5.0 RESULTS

5.1 Descriptive Results

Demographic Information

Descriptive statistics are found in Table 1 (all tables are found at the end of the chapter). The total number of respondents was 3,732, with slightly fewer males (1,857, 49.8%) than females (1,875, 50.2%). The age of respondents ranged from fifteen to nineteen; for the purposes of analysis this was divided into younger students (15-16 years) and older students (17-19 years). More respondents were in the older age group (55.5%). The mean age of respondents was 16.7 years (SD= 0.10 years). Students were evenly distributed amongst the grades with approximately one third of students being in each of grades ten, eleven and twelve.

Students were most likely to live with both their biological parents (63.8%) and very few lived with only their mother (13.2%). However, a considerable number of students (23%) reported an alternate living arrangement; either living with their mother and step-father or only with their father. Overall, just over one third (37.5%) of students described their families as being well-off, while approximately half (54.9%) of students reported that their families were average (neither well-off or badly off). Few (<10%) considered their families to be not very well off or not at all well off. The majority of students reported that their parents were employed; with slightly more fathers (93.6%) being employed than mothers (84.7%). More mothers (56.4%) had attained a post-secondary level of education than had fathers (51.7%).

Although half the sample reported not finding religion very important and an even smaller percentage reported attending religious services with any regularity (at least once a week or once a month), there were significant gender differences in both, with girls placing more importance on religion than boys (49.1% vs. 37.1%, respectively) and having greater frequency of religious attendance (26.5% vs. 19.2%). Even though school performance was fairly well distributed within genders by marks, girls were more likely (47.7%) to have high grades (≥80%), than boys (31.9%) while boys more often (38.0%)

received low grades (≤69%) than girls (23.1%). Just over half the sample was sexually initiated, having ever had vaginal sex, and girls were significantly more sexually active than boys. The majority of respondents (84.5%) had access to a school-based health centre (SBHC).

5.2 RQ1 – To What Extent Do Youth Receive Preventative Advice from Physicians in Accordance With GAPS in Specific Health Related Areas?

Comparing Preventative Health Advice From Doctors By Gender

Initially, domains of advice were created by collapsing related health advice topics as described in the Methods section. Analyses were completed to examine the extent of advice provided by family doctors and any doctor by gender, and the results are presented in Table 2. Although subsequent analyses consider only advice provided by any physician, questionnaire respondents had an opportunity to state whether the advice provided came from a family doctor or another kind of doctor. The majority of advice across all sixteen topics came from family doctors, with little added by "other doctor" to overall advice received for all advice categories.

Whether advice is provided by a family doctor or by any physician it can be seen that female adolescents receive significantly more preventative health advice, across topics, than male adolescents (Table 2). The domain where this does not hold true is for that of substance use, where males and females are asked equally about "using drugs", "using alcohol", and "driving under the influence".

Table 3 presents the proportions of adolescents who received preventative health advice on the sixteen GAPS topics from any doctor (family and/or other). It primarily examines gender differences in service provision within age group. As with the previous table, there is a strong trend of female adolescents being provided more preventative health advice than males regardless of their age category. This difference is significant in the domains of physical, sexual and psychosocial health; while, as before, the extent of substance use advice provided is fairly uniform across genders.

While physicians provide significantly more preventative health advice to girls in many of the GAPS recommended topics, these differences are most striking in the sexual health advice domain (Table 3). Here, female adolescents receive as much as six times the advice that males do on a variety of preventative health topics and this carries through from younger students to older students. Amongst younger adolescents, the largest difference in advice provided is for the topic of avoiding pregnancy where 28.4% of females in the sample and only 6.4% of males received preventative advice on this topic. This trend is even more marked amongst older adolescents with females being provided significantly more advice on avoiding pregnancy than males (5.9% vs. 35.6% respectively). The highest percentage of advice provided overall is on the topic of being sexually active; while 44.0% of older girls reports receiving this advice only one quarter of older boys are counselled on this topic (11.1%).

There are a few significant within-gender age effects on the provision of advice but these differences only exist for female adolescents (not shown). Older adolescent girls receive significantly more advice (all $< p=0.05$) than younger girls on being sexually active (44.0% vs. 34.1% respectively), using condoms (25.3% vs. 20.8% respectively), preventing STIs (25.3% vs. 20.6% respectively), avoiding pregnancy (35.6% vs. 28.4% respectively) and driving under the influence (8.1% vs. 5.5% respectively).

5.3 RQ2 a) – Analysis of the Association of Sociodemographic Characteristics with Higher Scores for Overall Preventative Topics Addressed

In order to carry out an analysis to examine the variables predicting the most comprehensive delivery of preventative counselling, a score of 0-16 was calculated. Next unadjusted and adjusted Poisson regression models, stratified by gender, were performed to examine associations of sociodemographic characteristics with receipt of comprehensive preventative health advice. Backwards stepwise regression was used to identify the most salient variables for the final multivariate model.

Unadjusted relative risks for the chance of being provided more preventative health advice were calculated for all independent sociodemographic variables using Poisson regression. The results of this are presented in Tables 4 and 5. The sociodemographic characteristics influencing higher scores were similar for boys and girls, with a few exceptions. Male adolescents who lived with only their mother were the most likely to be provided advice but for females having another living arrangement was a more powerful predictor. The effect of perceived SES on the provision of preventative health advice was the same for boys and girls. This trend was not linear; while students who were not well-off received more advice than well-off students, students in the average category of SES received less counselling than those students with high SES. Whereas girls who did not consider religion important were more likely to receive more preventative counselling, the inverse was true amongst boys. Parental education and employment were both significantly predictive variables for the provision of higher scores of advice across genders; the only area where this was not the case was for mother's employment in relation to the advice provided to adolescent girls.

In the adjusted model, having been provided more comprehensive preventative counselling on the topics specified by GAPS was predicted for male adolescents by age, perceived SES, school performance, religious importance, parental employment and father's education. Older female adolescents who had marks less than 70%, who attended religious services infrequently, who lived in an alternate living arrangement and whose fathers' were unemployed were more likely to receive higher scores on preventative health advice provided. Students who considered their families to be neither well-off nor not well-off were less likely to receive comprehensive advice.

Older age was predictive of having been provided more comprehensive preventative counselling for girls but not boys. While in the unadjusted results, having low marks (<70%) was consistently predictive of being provided more comprehensive advice across genders, in the adjusted model this differed from males to females. Male adolescents with marks between 70-79% were the most likely to receive higher scores on preventative advice; by contrast the female adolescents most likely to be provided

comprehensive advice were those with marks below 70%. Boys who viewed religion as unimportant were less likely to be provided comprehensive advice than those who found religion important; this was not a significant predictor of advice received for girls.

5.4 RQ2 b), RQ3 and RQ4 – Associations of Sociodemographic Characteristics, Need and the Presence of School-Based Health Centres on the Provision of Preventative Advice by Domain.

The associations of several of the key sociodemographic factors, their need and the presence of a SBHC with having received preventative health advice in the four domains specified by GAPS are outlined below. The analysis steps for research question two were combined with those of research questions three and four and a new model to represent each research question was created. All of the analyses were carried out with the domains described above, using logistic regression and stratified by gender. First unadjusted logistic regression models were used to examine the predictors of being provided advice by domain. Backwards stepwise regression was then used to identify the most influential sociodemographic variables. Adjusted logistic regressions helped pinpoint the variables most likely to predict having received preventative counselling by domain for each gender (Model 1). The analysis for each subsequent research question began by including all the original sociodemographic variables and then forcing need and, in turn, SBHC to remain in the backwards stepwise regressions until a final Model 2 and Model 3 could be built for each domain and gender. Finally, adjusted logistic regression was performed on each of the models to gain a better understanding of how being in need and presence of SBHC affect the provision of preventative advice by physicians. Tables 6-13 present the results of the unadjusted, Model 1, Model 2 and Model 3 analyses by domain and by gender. The results of the physical, sexual, substance use and psychosocial domain analyses for male adolescents can be found on Tables 6, 8, 10 and 12, respectively while Tables 7, 9, 11 and 13 contain the corresponding results for female adolescents.

UNADJUSTED RESULTS

Male Adolescents

The unadjusted analysis results for male adolescents can be found in the first column of Tables 6, 8, 10, and 12. Average marks on the last report card had an influence on the odds of receiving advice across all four domains for adolescent boys but the trend was not in same direction in all cases. While in most of the domains, boys with marks below 70% were the most likely to receive advice, in the physical health advice domain, those most likely to receive advice were boys whose average mark was between 70-79%. Parental education was only significant in two domains; having a father with a high school education was predictive of being provided sexual health advice and having mother with a high school education of less predicted the receipt of substance use advice. The likelihood of being provided either sexual or psychosocial advice increased for students whose mothers were unemployed. Being in need was a predictor for the provision of preventative health advice across domains for males as was the presence of a SBHC with the exception of the substance use domain.

Female Adolescents

The first column of Tables 7, 9, 11 and 13 presents the unadjusted analysis results for female adolescents. Older adolescents were only more likely to be provided advice in the domain of sexual health. With the exception of the domain of physical health, students were most likely to receive preventative advice if they lived in an alternative living situation (i.e. not with both parents or with a single mother). Believing their family to be not well-off was a predictor for the provision of advice in sexual and psychosocial health domains. Having poor school performance was highly predictive of being provided advice across domains for girls. While religiosity did not have a consistent effect across domains, adolescent girls who did not frequently attend church services or consider religion important were more likely to receive sexual health preventative advice and those who only went to church infrequently were targeted with substance use advice. Parental education was a significant predictor of the provision of advice across the board with the exception of the psychosocial health domain where father's education was not predictive. Having parents who were unemployed only increased the likelihood of the

provision of advice in the substance use domain. Girls in need were more likely to receive advice in all domains than girls who had no need while the presence of a SBHC only increased the provision of physical health advice.

Gender Differences

Older girls received more sexual health advice while age had no effect for boys. The influence of living situation differed by gender. In the sexual health domain, boys who lived with only their mother were most likely to receive advice while girls who had an alternate living arrangement were the most likely to receive advice. Furthermore living situation was a predictor of the provision of substance use and psychosocial advice for girls but not for boys. Generally perceived SES was not associated with increased advice, but for adolescent females, not perceiving themselves as being well-off predicted the provision of sexual and psychosocial advice. Poor school marks were highly associated with the provision of significantly more advice across genders and domains. Average marks were consistently associated with increased advice for boys across domains but this was only true for girls in the substance use and psychosocial health domains. While attending religious services frequently or viewing religion as important were predictive of the provision of sexual health and substance use advice in girls, neither of these variables was significant in any domain for boys. Having parents with only a high school education or less increased the likelihood of preventative advice more consistently across domain for girls than for boys while parental unemployment was a predictor for substance use advice for girls and maternal unemployment predicted psychosocial health advice in boys. Although need predicted the receipt of advice across domain for both genders, this relationship was stronger for female adolescents. For boys, having a school-based health centre at their school increased the provision of preventative health advice for all domains except substance use while for girls, this variable was only a predictor of advice in the physical health domain.

Adjusted Associations of Sociodemographic Characteristics with the Provision of Preventative Health Advice Across Domains (Model 1)

Male Adolescents

The results of the Model 1 analyses for each of the four domains are presented in the second column on Tables 6, 8, 10, and 12. Across all domains, adolescent males who had average marks below 80% were significantly more likely to be provided preventative health advice. Male students who had mothers who were unemployed had an increased likelihood of being provided advice in the domains of sexual and psychosocial health advice and students with fathers with a high school education or less also received more sexual health advice. The following factors had a negative influence on the amount of advice received: seeing religion as not important predicted less physical and substance use health advice provided and perceiving one's family to be of average SES indicated less sexual health advice received.

Female Adolescents

The adjusted associations of sociodemographic characteristics with the provision of advice (Model 1) are indicated in the second column of Tables 7, 9, 11 and 13 for female adolescents. In Model 1, a similar result to that for boys emerges; having marks below 70% greatly increased the likelihood of preventative advice being provided across domains. Religious importance influenced the provision of preventative health advice in the sexual health and psychosocial health domains but the direction of the trend was different for each domain; not viewing religion as important increased the likelihood of the provision of sexual health advice but decreased the likelihood for psychosocial health advice. Religious attendance was only significant in the domain of substance use – here, attending religious services infrequently predicted more advice. Female students living in a household situation other than with both biological parents, or a single mother were more likely to be provided advice in all domains except physical health. Older females whose fathers had a high school education or less were more likely to be provided sexual health advice, those who attended religious services infrequently and had fathers who were unemployed were more likely to receive substance use advice and females whose families were not well-off were more likely to receive psychosocial health advice.

Gender Differences

The most consistent significant sociodemographic predictors of preventative health advice provision for boys were average mark and parental employment whereas for girls they were average mark and living situation. Religious attendance and importance had opposite effects on the likelihood of advice in several domains for boys and girls. Overall parental education and perceived SES were not reliable predictors for the provision of preventative health advice.

Associations of Sociodemographic Characteristics Adjusted for Need with the Provision of Preventative Health Advice Across Domains (Model 2)

The effect of including need in the analysis of the sociodemographic variables by domain of health advice was examined and the results of these adjusted analyses are presented in the tables below: Tables 6, 8, 10 and 12 for male adolescents and Tables 7, 9, 11 and 13 for female adolescents. A student was categorized as being "in need" of preventative advice in a certain domain if they had ever engaged in a specified behaviour within that domain. In the case of the substance use domain where "ever try" responses were highly prevalent, "current use" as defined by binge drinking one or more times in the past month, and smoking cigarettes or using marijuana one or more times in the past month, was used.

Male Adolescents

The addition of need to the model did not have a large effect on the ORs for the sociodemographic predictors of the provision of preventative advice to males seen in the previous model (Tables 6, 8, 10 and 12). It consistently diluted the predictive effect of low marks across domains but this variable remained significant in the model. Adjusting for need also made religious importance become non-significant in the model for physical health advice. However, being in need significantly affected the provision of preventative advice across domains, with the exception of the physical health domain.

Female Adolescents

The addition of need into the model had a more powerful effect on the associated sociodemographic predictor variables for female adolescents than for males, except in the domain of physical health where there were no differences (Tables 7, 9, 11 and 13). Once need was included in the multivariate model, the odds of low marks affecting the provision of advice was decreased across domains. In the sexual health domain; age, living situation and religious importance all ceased to be significant predictors of the provision of health advice and in the psychosocial health domain controlling for need made living situation and perceived SES non-significant. Need was also a stronger predictor of the provision of advice across domains for females than for males.

Gender Differences

Need predicted the provision of advice in all 8 domain and gender combinations, although this was not significant for males in the domain of physical health. Being in need had a stronger effect on the provision of advice for females than for males therefore we can say that adolescent females in need are provided more advice across domains than adolescent males in need. In the domain of physical health, having marks between 70-79% increased the likelihood of provision of advice for boys while having marks below 70% was the most predictive for girls. For girls, the addition of need to the model for substance use advice made religious attendance not significant whereas for boys it only weakened the effect of religious importance.

How Need Affects the Provision of Advice by Domain for Each Gender

An additional analysis was performed to examine the effect of need on the extent of counselling delivered to both genders by domain. The results of this analysis are given in Table 14 where it can be seen that for both genders, across all domains of advice, students in need of advice were provided significantly more preventative counselling on that topic. Once again, this difference was most evident in the domain of sexual health advice where boys in need receive significantly more advice that those not in need (21.8% vs. 9.1% respectively) and the same is true for girls (60.5% vs. 26.9%

respectively). It should be noted that while students in need are provided higher levels of preventative advice, these percentages still fall short of the ideal (100% provision).

Associations of Sociodemographic Characteristics and Need Adjusted for SBHC with the Provision of Preventative Health Advice Across Domains (Model 3)

In this final set of models, seen in Tables 6, 8, 10 and 12 for boys and Tables 7, 9, 11 and 13 for girls, logistic regression was used once again to calculate the relative influence of the presence of a SBHC on the associations of sociodemographic characteristics and need on the provision of preventative advice on all four domains. The addition of SBHC to the model (Model 3) did not significantly interact with need except to increase the odds ratio for the effect of being in need in approximately half the cases.

Male Adolescents

The data showing the effect of presence of SBHC on the associations of need and sociodemographic factors with the likelihood of the provision of preventative advice to males are presented in the third column of Tables 6, 8, 10 and 12. With the addition of SBHC into the model the adjusted odds ratios for the association of school marks below 80% with the provision of advice decreased but remained significant in all domains. Male adolescents with average marks below 80%, who were identified as being in need and who had access to a SBHC were more likely to receive preventative health advice across domains. The effect of SBHC was only significant for the domains of physical and sexual health preventative advice. Access to a SBHC increased the odds ratios for the association of need and sociodemographic factors with the provision of advice in three domains (physical, sexual and substance use) and lowered it in the domain of psychosocial health. Finally, when presence of a SBHC is added to the model for sexual health the variable for perceived SES was dropped.

Female Adolescents

The third column of Tables 7, 9, 11 and 13 shows the results of the analyses for Model 3 for female adolescents. The effect of SBHC on the associations of sociodemographic characteristics and need with the provision of preventative advice was not significant for three of the four domains. As a result, it had very little effect on the models for the domains of substance use and psychosocial health. The effect of having marks below 70% on the provision of advice was the only odds ratio that consistently changed across domains after adjusting for SBHC; in the domain of physical health it decreased and in the other three it increased. Although physical health was the only domain where the effect of access to a SBHC was significant, controlling for the effect of SBHC had the strongest influence on the adjusted model in the domain of sexual health. In three of the four domains, SBHC did not affect the odds ratios for need in their association with sociodemographic factors and the provision of advice; only in the domain of sexual health did controlling for SBHC increase the odds ratio for the likelihood of advice being provided based on need.

Gender Differences

The effect of adjusting for presence of a SBHC was similar across genders but there were some key differences; it had a stronger influence on the effect of need for boys and was non-significant in more of the domains of advice for girls.

Effect of Presence of SBHC

Table 15 presents the proportions of students receiving preventative advice from a physician on the 16 GAPS topics for schools with SBHCs and those without. Overall, students in a school with a SBHC are provided more preventative health advice by physicians than students in schools without a SBHC in the majority of the health advice topics specified by GAPS. The topics for which these results are significant are: exercise, healthy diet and weight, preventing HIV, sexual orientation, using drugs and alcohol, driving under the influence, mood, school performance, and family relationships.

Table 1 – Demographic statistics of study population by gender (analysis based on a Chi-Square test)

Demographic Characteristics	Males (n=1,857) 49.8%	Females (n=1,875) 50.2%	Chi Square Test
Age			$X^2 = 25.2$, $p < 0.001$
Fifteen	9.6% (177)	11.9% (222)	
Sixteen	33.4% (615)	34.1% (637)	
Seventeen	31.7% (584)	33.2% (621)	
Eighteen	21.2% (390)	19.2% (360)	
Nineteen	4.0% (74)	1.7% (31)	
Mean Age	*16.8 years*	*16.7 years*	
Grade			$X^2 = 3.3$, $p = 0.197$
Ten	33.9% (629)	36.2% (677)	
Eleven	34.3% (636)	34.6% (647)	
Twelve	31.8% (589)	29.3% (548)	
Living Arrangement			$X^2 = 5.2$, $p = 0.073$
Both Parents	65.4% (1,214)	62.1% (1,165)	
Mother Only	12.2% (226)	14.3% (268)	
Other Arrangement	22.5% (417)	23.6% (442)	
Perceived SES			$X^2 = 3.4$, $p = 0.186$
Well off	37.7% (692)	37.3% (692)	
Average	55.5% (1,019)	54.3% (1,007)	
Not well off	6.9% (126)	8.5% (157)	
Mother's Employment			$X^2 = 0.1$, $p = 0.775$
Employed	84.9% (1,529)	84.6% (1,544)	
Father's Employment			$X^2 = 0.7$, $p = 0.410$
Employed	94.0% (1,640)	93.3% (1,630)	
Mother's Education			$X^2 = 0.03$, $p = 0.856$
High School or Less	43.5% (729)	43.8% (767)	
Post Secondary	56.5% (948)	56.2% (985)	
Father's Education			$X^2 = 0.01$, $p = 0.909$
High School or Less	48.2% (781)	48.4% (807)	
Post Secondary	51.8% (838)	51.6% (859)	
Religion (Importance)			$X^2 = 54.1$, $p < 0.001$
Important	37.1% (685)	49.1% (916)	
Not Important	62.9% (1,161)	50.9% (951)	
Religion (Frequency)			$X^2 = 27.3$, $p < 0.001$
Frequent (once/week or /month)	19.2% (356)	26.5% (494)	
Infrequent (few, /year or never)	80.8% (1,494)	73.6% (1,374)	
School Performance			$X^2 = 126.4$, $p < 0.001$
Marks – High ($\geq$ 80%)	31.9% (590)	47.7% (888)	
Marks – Middle (70-79%)	30.1% (557)	29.3% (545)	
Marks – Low ($\leq$ 69%)	38.0% (704)	23.1% (430)	
Sexually Active			$X^2 = 5.1$, $p = 0.023$
Yes	51.2% (939)	54.9% (1,027)	
No	48.8% (896)	45.1% (844)	
Access to SBHC			$X^2 = 2.3$, $p = 0.134$
Yes	85.4% (1,585)	83.6% (1,567)	
No	14.7% (272)	16.4% (308)	

N.B. For mother's education, father's education, mother's job and father's job the "N/A" and "don't know" responses have been made into missing and chi squares have only been calculated on "high school or less" vs. "post-secondary" and "employed" vs. "unemployed".

Table 2: Preventative Health Advice Topics Provided By Gender From Family Physicians and Any Physicians						
Preventative Health Advice Topic	**Received from Family Physician (%)***			**Received From Any Physician (%)***		
	Males**	**Females****	**p-value**	**Males****	**Females****	**p-value**
Physical Health Domain						
Exercise	17.6	21.6	0.002	20.9	24.5	0.010
Healthy Diet	15.5	24.1	<0.001	18.8	27.7	<0.001
Healthy Weight	15.5	22.1	<0.001	18.6	24.8	<0.001
Sexual Health Domain						
Being Sexually Active	8.3	36.1	<0.001	10.5	39.6	<0.001
Using Condoms	7.2	21.0	<0.001	8.9	23.3	<0.001
Preventing STIs	7.4	21.0	<0.001	9.4	23.2	<0.001
Preventing HIV	6.1	15.6	<0.001	7.8	17.5	<0.001
Avoiding Pregnancy	4.6	29.8	<0.001	6.1	32.5	<0.001
Sexual Orientation	3.4	8.7	<0.001	5.0	9.9	<0.001
Substance Use Domain						
Smoking	14.1	18.6	<0.001	17.1	20.6	0.007
Using Drugs	10.3	10.1	0.853	12.9	11.7	0.261
Using Alcohol	9.7	9.7	0.948	12.5	11.6	0.447
Driving Under Influence	5.7	5.2	0.461	7.8	6.7	0.206
Psychosocial Health Domain						
Mood/ Level of Happiness	8.3	18.0	<0.001	10.4	20.7	<0.001
School Achievement	10.5	13.8	0.003	12.7	16.0	0.005
Family Relationships	5.6	9.5	<0.001	7.3	11.6	<0.001
*percentages are from total sample of 3732 minus the missing for each question **Male/Female percentages are based on row percentages (out of all boys, out of all girls)						

Table 3: Preventative Advice Provided By Any Physician – Within-Age-Group Gender Differences						
Preventative Health Advice Topic	**Age 15-16 – Advice From Any Physician (%)***			**Age 17-19 – Advice From Any Physician (%)***		
	M**	**F****	**p-value**	**M****	**F****	**p-value**
Physical Health Domain						
Exercise	21.1	22.7	0.437	20.9	26.0	0.008
Healthy Diet	19.3	26.4	0.001	18.6	28.7	<0.001
Healthy Weight	18.9	23.7	0.018	18.5	25.6	<0.001
Sexual Health Domain						
Being Sexually Active	9.8	34.1	<0.001	11.1	44.0	<0.001
Using Condoms	9.4	20.8	<0.001	8.7	25.3	<0.001
Preventing STIs	9.8	20.6	<0.001	9.2	25.3	<0.001
Preventing HIV	7.6	16.3	<0.001	8.1	18.5	<0.001
Avoiding Pregnancy	6.4	28.4	<0.001	5.9	35.6	<0.001
Sexual Orientation	5.9	10.2	0.002	4.4	9.5	<0.001
Substance Use Domain						
Smoking	16.4	18.8	0.193	17.7	21.8	0.020
Using Drugs	12.2	12.2	0.969	13.5	11.3	0.122
Using Alcohol	11.8	11.4	0.808	13.1	11.7	0.359
Driving Under Influence	8.0	8.1	0.905	7.7	5.5	0.043
Psychosocial Health Domain						
Mood/Level of Happiness	10.9	18.9	<0.001	10.2	22.0	<0.001
How Doing In School	14.1	17.3	0.080	11.7	14.9	0.037
Family Relationships	7.8	11.4	0.014	7.1	11.5	0.001
*percentages are from total sample of 3732 minus the missing for each question *Male/Female percentages are based on row percentage (out of all boys, out of all girls)						

Table 4. Associations of sociodemographic factors with male adolescents receiving a higher score on preventative health advice topics (0→16)

Factor Unadj	usted RR of Receiving a Higher Score †	p-value	Adjusted RR of Receiving a Higher Score †	p-value
1. Age * (per increase in year)	0.98	0.305	---	N.S.
2. Living Situation				
Living With Both Parents	1.00		1.00	
Living With Mother Only	1.30	<0.001	1.36	<0.001
Other Arrangement	1.12	0.008	1.02	0.627
3. Perceived SES				
Well-off	1.00		1.00	
Average	0.90	0.006	0.87	0.001
Not Well-off	1.23	0.003	1.13	0.123
4. Average Mark on Last Report Card				
80% or Above	1.00		1.00	
70% to 79%	1.51	<0.001	1.63	<0.001
69% or Less	1.52	<0.001	1.54	<0.001
5. Religious Attendance				
Frequent	1.00		---	
Infrequent	0.98	0.638	---	N.S.
6. Religious Importance				
Important	1.00		1.00	
Not Important	0.88	0.001	0.79	<0.001
7. Mother's Education				
Post-Secondary	1.00		---	
High School or Less	1.12	0.001	---	N.S.
8. Father's Education				
Post-Secondary	1.00		1.00	
High School or Less	1.20	<0.001	1.19	<0.001
9. Mother's Employment				
Employed	1.00		1.00	
Unemployed	1.32	<0.001	1.37	<0.001
10. Father's Employment				
Employed	1.00		1.00	
Unemployed	1.45	<0.001	1.25	0.002

*Age was retained for analytic purposes.

† Results indicated here represent Relative Risks (RR) for the chance of receiving more preventative advice.

Table 5. Associations of sociodemographic factors with female adolescents receiving a higher score on preventative health advice topics (0→16)

Factor Unadj	usted RR of Receiving a Higher Score †	p-value	Adjusted RR of Receiving a Higher Score †	p-value
1. Age * (per increase in year)	1.10	<0.001	1.08	<0.001
2. Living Situation				
Living With Both Parents	1.00		1.00	
Living With Mother Only	1.23	<0.001	1.11	0.030
Other Arrangement	1.37	<0.001	1.20	<0.001
3. Perceived SES				
Well-off	1.00		1.00	
Average	0.99	0.658	0.90	0.001
Not Well-off	1.34	<0.001	1.04	0.478
4. Average Mark on Last Report Card				
80% or Above	1.00		1.00	
70% to 79%	1.27	<0.001	1.21	<0.001
69% or Less	1.75	<0.001	1.61	<0.001
5. Religious Attendance				
Frequent	1.00		1.00	
Infrequent	1.25	0.001	1.09	0.001
6. Religious Importance				
Important	1.00		---	
Not Important	1.06	0.023	---	N.S.
7. Mother's Education				
Post-Secondary	1.00		---	
High School or Less	1.18	<0.001	---	N.S.
8. Father's Education				
Post-Secondary	1.00		---	
High School or Less	1.15	<0.001	---	N.S.
9. Mother's Employment				
Employed	1.00		---	
Unemployed	0.97	0.470	---	N.S.
10. Father's Employment				
Employed	1.00		1.00	
Unemployed	1.22	<0.001	1.15	0.009

*Age was retained for analytic purposes.

† Results indicated here represent Relative Risks (RR) for the chance of receiving more preventative advice.

Table 6. Associations of sociodemographic factors, need and presence of SBHC with male adolescents receiving physical health preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	0.99	0.944	---	N.S.	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		---		---		---	
Living With Mother Only	1.17	0.316	---	N.S.	---	N.S.	---	N.S.
Other Arrangement	0.87	0.267	---	N.S.	---	N.S.	---	N.S.
3. Perceived SES								
Well-off	1.00		---		---		---	
Average	0.93	0.492	---	N.S.	---	N.S.	---	N.S.
Not Well-off	1.04	0.864	---	N.S.	---	N.S.	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.51	0.002	1.52	0.002	1.50	0.003	1.43	0.009
69% or Less	1.35	0.020	1.31	0.041	1.28	0.064	1.22	0.133
5. Religious Attendance								
Frequent	1.00		---		---		---	
Infrequent	0.98	0.866	---	N.S.	---	N.S.	---	N.S.
6. Religious Importance								
Important	1.00		1.00		1.00		---	
Not Important	0.83	0.085	0.80	0.042	0.81	0.068	---	N.S.
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.19	0.101	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.10	0.398	---	N.S.	---	N.S.	---	N.S.
9. Mother's Employment								
Employed	1.00		---		---		---	
Unemployed	1.16	0.314	---	N.S.	---	N.S.	---	N.S.
10. Father's Employment								
Employed	1.00		1.00		1.00		1.00	
Unemployed	1.45	0.077	1.43	0.097	1.45	0.084	1.43	0.093
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	1.24	0.039	---	---	1.22	0.074	1.23	0.057
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.65	0.002	---	---	---	---	1.56	0.008

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 7. Associations of sociodemographic factors, need and presence of SBHC with female adolescents receiving physical health preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	1.09	0.360	---	N.S.	---	N.S	---	N.S
2. Living Situation								
Living With Both Parents	1.00		---		---		---	
Living With Mother Only	1.23	0.132	---	N.S.	---	N.S	---	N.S
Other Arrangement	1.12	0.333	---	N.S.	---	N.S	---	N.S
3. Perceived SES								
Well-off	1.00		---		---		---	
Average	0.92	0.407	---	N.S.	---	N.S	---	N.S
Not Well-off	1.39	0.065	---	N.S.	---	N.S	---	N.S
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.13	0.297	1.15	0.241	1.12	0.315	1.09	0.465
69% or Less	1.73	<0.001	1.80	<0.001	1.77	<0.001	1.70	<0.001
5. Religious Attendance								
Frequent	1.00		---		---		---	
Infrequent	1.11	0.319	---	N.S.	---	---	---	---
6. Religious Importance								
Important	1.00		1.00		1.00		1.00	
Not Important	0.89	0.239	0.85	0.087	0.84	0.083	0.85	0.099
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.28	0.014	---	N.S.	---	N.S	---	N.S
8. Father's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.25	0.027	---	N.S.	---	N.S	---	N.S
9. Mother's Employment								
Employed	1.00		---		---		---	
Unemployed	0.91	0.472	---	N.S.	---	N.S	---	N.S
10. Father's Employment								
Employed	1.00		---		---		---	
Unemployed	1.23	0.278	---	N.S.	---	N.S.	---	N.S.
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	1.28	0.017	---	---	1.25	0.037	1.25	0.036
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.55	0.001	---	---	---	---	1.46	0.007

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 8. Associations of sociodemographic factors, need and presence of SBHC with male adolescents receiving sexual health preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	1.10	0.489	---	N.S.	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		---		---		---	
Living With Mother Only	1.75	0.003	---	N.S.	---	N.S.	---	N.S.
Other Arrangement	1.51	0.008	---	N.S.	---	N.S.	---	N.S.
3. Perceived SES								
Well-off	1.00		1.00		1.00		---	
Average	0.82	0.165	0.72	0.033	0.73	0.043	---	N.S.
Not Well-off	1.47	0.112	1.10	0.734	1.07	0.805	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.80	0.001	2.07	<0.001	1.76	0.006	1.61	0.019
69% or Less	2.09	<0.001	2.37	<0.001	1.88	0.001	1.70	0.007
5. Religious Attendance								
Frequent	1.00		---		---		---	
Infrequent	1.30	0.138	---	N.S.	---	N.S.	---	N.S.
6. Religious Importance								
Important	1.00		---		---		---	
Not Important	0.96	0.784	---	N.S.	---	N.S.	---	N.S.
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.08	0.622	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		1.00		1.00		1.00	
High School or Less	1.59	0.001	1.47	0.011	1.47	0.011	1.45	0.013
9. Mother's Employment								
Employed	1.00		1.00		1.00		1.00	
Unemployed	1.56	0.008	1.69	0.004	1.75	0.003	1.75	0.003
10. Father's Employment								
Employed	1.00		---		---		---	
Unemployed	1.54	0.088	---	N.S.	---	N.S.	---	N.S.
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	2.77	<0.001	---	---	2.88	<0.001	2.93	<0.001
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.67	0.015	---	---	---	---	1.81	0.015

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 9. Associations of sociodemographic factors, need and presence of SBHC with female adolescents receiving sexual health preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		1.00		---		---	
17-19 Years	1.49	<0.001	1.39	0.001	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		1.00		---		---	
Living With Mother Only	1.26	0.088	1.08	0.618	---	N.S.	---	N.S.
Other Arrangement	1.63	<0.001	1.31	0.031	---	N.S.	---	N.S.
3. Perceived SES								
Well-off	1.00		---		---		---	
Average	1.06	0.565	---	N.S.	---	N.S.	---	N.S.
Not Well-off	1.57	0.011	---	N.S.	---	N.S.	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.22	0.070	1.13	0.313	1.00	0.995	1.02	0.866
69% or Less	1.84	<0.001	1.67	<0.001	1.32	0.046	1.36	0.031
5. Religious Attendance								
Frequent	1.00		---		---		---	
Infrequent	1.33	0.007	---	N.S.	---	N.S.	---	N.S.
6. Religious Importance								
Important	1.00		1.00		---		---	
Not Important	1.32	0.003	1.23	0.036	---	N.S.	---	N.S.
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.20	0.050	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		1.00		1.00		1.00	
High School or Less	1.41	<0.001	1.25	0.031	1.23	0.050	1.23	0.054
9. Mother's Employment								
Employed	1.00		---		1.00		1.00	
Unemployed	0.84	0.180	---	N.S.	0.78	0.096	0.78	0.089
10. Father's Employment								
Employed	1.00		---		---		---	
Unemployed	1.43	0.061	---	N.S.	---	N.S.	---	N.S.
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	4.15	<0.001	---	---	3.63	<0.001	3.70	<0.001
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.02	0.848	---	---	---	---	0.79	0.101

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 10. Associations of sociodemographic factors, need and presence of SBHC with male adolescents receiving substance use preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	1.16	0.203	---	N.S.	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		---		---		---	
Living With Mother Only	1.13	0.498	---	N.S.	---	N.S.	---	N.S.
Other Arrangement	1.11	0.456	---	N.S.	---	N.S.	---	N.S.
3. Perceived SES								
Well-off	1.00		---		---		---	
Average	1.00	0.992	---	N.S.	---	N.S.	---	N.S.
Not Well-off	1.26	0.309	---	N.S.	---	N.S.	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.68	0.001	1.76	<0.001	1.70	0.001	1.69	0.001
69% or Less	1.80	<0.001	1.90	<0.001	1.73	<0.001	1.73	<0.001
5. Religious Attendance								
Frequent	1.00		---		---		---	
Infrequent	0.89	0.447	---	N.S.	---	N.S.	---	N.S.
6. Religious Importance								
Important	1.00		1.00		1.00		1.00	
Not Important	0.81	0.070	0.75	0.015	0.72	0.008	0.72	0.009
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.28	0.046	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.19	0.166	---	N.S.	---	N.S.	---	N.S.
9. Mother's Employment								
Employed	1.00		---		---		---	
Unemployed	1.27	0.134	---	N.S.	---	N.S.	---	N.S.
10. Father's Employment								
Employed	1.00		---		---		---	
Unemployed	1.54	0.056	---	N.S.	---	N.S.	---	N.S.
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	1.65	<0.001	---	---	1.57	<0.001	1.58	<0.001
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.17	0.348	---	---	---	---	1.10	0.569

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 11. Associations of sociodemographic factors, need and presence of SBHC with female adolescents receiving substance use preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	1.16	0.183	---	N.S.	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		1.00		1.00		1.00	
Living With Mother Only	1.33	0.075	1.24	0.255	1.19	0.344	1.19	0.340
Other Arrangement	1.98	<0.001	1.47	0.005	1.44	0.008	1.44	0.008
3. Perceived SES								
Well-off	1.00		---		---		---	
Average	1.06	0.608	---	N.S.	---	N.S.	---	N.S.
Not Well-off	1.39	0.096	---	N.S.	---	N.S.	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.70	<0.001	1.64	0.001	1.59	0.001	1.59	0.001
69% or Less	3.47	<0.001	3.13	<0.001	2.87	<0.001	2.88	<0.001
5. Religious Attendance								
Frequent	1.00		1.00		---		---	
Infrequent	1.67	<0.001	1.33	0.050	---	N.S.	---	N.S.
6. Religious Importance								
Important	1.00		---		---		---	
Not Important	1.20	0.083	---	N.S.	---	N.S.	---	N.S.
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.56	<0.001	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.41	0.003	---	N.S.	---	N.S.	---	N.S.
9. Mother's Employment								
Employed	1.00		---		---		---	
Unemployed	1.45	0.011	---	N.S.	---	N.S.	---	N.S.
10. Father's Employment								
Employed	1.00		1.00		1.00		1.00	
Unemployed	1.96	0.001	1.72	0.011	1.72	0.011	1.72	0.011
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	2.02	<0.001	---	---	1.68	<0.001	1.68	<0.001
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.23	0.170	---	---	---	---	0.97	0.877

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 12. Associations of sociodemographic factors, need and presence of SBHC with male adolescents receiving psychosocial health preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	0.91	0.465	---	N.S.	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		---		---		---	
Living With Mother Only	1.18	0.378	---	N.S.	---	N.S.	---	N.S.
Other Arrangement	1.21	0.190	---	N.S.	---	N.S.	---	N.S.
3. Perceived SES								
Well-off	1.00		---		---		---	
Average	0.83	0.153	---	N.S.	---	N.S.	---	N.S.
Not Well-off	1.51	0.074	---	N.S.	---	N.S.	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.44	0.028	1.52	0.013	1.48	0.019	1.45	0.026
69% or Less	1.54	0.005	1.53	0.009	1.45	0.024	1.43	0.029
5. Religious Attendance								
Frequent	1.00		1.00		1.00		1.00	
Infrequent	0.81	0.152	0.75	0.074	0.75	0.075	0.76	0.080
6. Religious Importance								
Important	1.00		---		---		---	
Not Important	0.94	0.648	---	N.S.	---	N.S.	---	N.S.
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.10	0.497	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.14	0.328	---	N.S.	---	N.S.	---	N.S.
9. Mother's Employment								
Employed	1.00		1.00		1.00		1.00	
Unemployed	1.61	0.003	1.59	0.004	1.56	0.006	1.56	0.005
10. Father's Employment								
Employed	1.00		---		---		---	
Unemployed	1.45	0.127	---	N.S.	---	N.S.	---	N.S.
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	1.70	<0.001	---	---	1.50	0.006	1.47	0.009
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.53	0.027	---	---	---	---	1.46	0.058

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 13. Associations of sociodemographic factors, need and presence of SBHC with female adolescents receiving psychosocial health preventative advice from a physician

Factor Unadj	usted OR of Receiving Advice	p-value	Adjusted OR of Receiving Advice* (Model 1)	p-value	Adjusted OR of Receiving Advice Including Need* (Model 2)	p-value	Adjusted OR of Receiving Advice Including Need and SBHC* (Model 3)	p-value
1. Age **								
15-16 Years	1.00		---		---		---	
17-19 Years	1.06	0.601	---	N.S.	---	N.S.	---	N.S.
2. Living Situation								
Living With Both Parents	1.00		1.00		---		---	
Living With Mother Only	1.25	0.140	1.14	0.392	---	N.S.	---	N.S.
Other Arrangement	1.59	<0.001	1.44	0.005	---	N.S.	---	N.S.
3. Perceived SES								
Well-off	1.00		1.00		---		---	
Average	1.11	0.370	1.02	0.835	---	N.S.	---	N.S.
Not Well-off	1.94	<0.001	1.58	0.020	---	N.S.	---	N.S.
4. Average Mark								
80% or Above	1.00		1.00		1.00		1.00	
70% to 79%	1.32	0.025	1.28	0.053	1.25	0.085	1.25	0.081
69% or Less	2.13	<0.001	2.01	<0.001	1.94	<0.001	1.95	<0.001
5. Religious Attendance								
Frequent	1.00		---		---		---	
Infrequent	1.03	0.795	---	N.S.	---	N.S.	---	N.S.
6. Religious Importance								
Important	1.00		1.00		1.00		1.00	
Not Important	0.85	0.120	0.76	0.013	0.76	0.014	0.76	0.014
7. Mother's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.23	0.050	---	N.S.	---	N.S.	---	N.S.
8. Father's Education								
Post-Secondary	1.00		---		---		---	
High School or Less	1.16	0.159	---	N.S.	---	N.S.	---	N.S.
9. Mother's Employment								
Employed	1.00		---		---		---	
Unemployed	1.14	0.359	---	N.S.	---	N.S.	---	N.S.
10. Father's Employment								
Employed	1.00		---		---		---	
Unemployed	1.30	0.212	---	N.S.	---	N.S.	---	N.S.
11. Need								
No Need	1.00		---	---	1.00		1.00	
Need	2.29	<0.001	---	---	2.17	<0.001	2.17	<0.001
12. Presence of SBHC								
No SBHC	1.00		---	---	---	---	1.00	
SBHC	1.13	0.395	---	---	---	---	0.96	0.759

*Adjusted effects were calculated only for those variables that were deemed significant in a backward stepwise regression.
**Age was retained for analytic purposes.

Table 14: Extent of advice provided by a physician in each domain by need status for each gender						
Advice Domains	**Males (%)**			**Females (%)**		
	No Need	**Need**	**p-value**	**No Need**	**Need**	**p-value**
Physical Health Advice	26.3%	30.8%	0.039	32.3%	38.0%	0.017
Sexual Health Advice	9.1%	21.8%	<0.001	26.9%	60.5%	<0.001
Substance Use Advice	15.8%	23.7%	<0.001	16.8%	29.0%	<0.001
Psychosocial Health Advice	15.7%	24.0%	<0.001	22.4%	39.7%	<0.001

Table 15: Preventative health advice from a physician by presence of a school-based health centre			
Preventative Health Advice Topic	**Advice from Physician for SBHC Schools (n=3,152) (%)***	**Advice from Physician for non-SBHC Schools (n=580) (%)****	**p-value**
Exercise	23.9	16.4	<0.001
Healthy Diet	24.4	17.1	<0.001
Healthy Weight	23.4	12.8	<0.001
Being Sexually Active	25.0	25.4	0.842
Using Condoms	16.6	14.1	0.128
Preventing STIs	16.8	14.1	0.103
Preventing HIV	13.3	9.8	0.021
Avoiding Pregnancy	19.6	18.6	0.556
Sexual Orientation	7.9	5.4	0.038
Smoking	19.2	16.8	0.174
Using Drugs	13.2	7.5	<0.001
Using Alcohol	12.8	8.2	0.002
Driving Under Influence	7.9	4.0	0.001
Mood/Level of Happiness	16.3	12.2	0.013
How Doing In School	14.8	12.0	0.079
Family Relationships	10.3	5.0	<0.001
*percentages are from total sample of 3152 minus the missing for each question **percentages are from total sample of 580 minus the missing for each question			

CHAPTER 6.0 DISCUSSION

This study presents a picture of how well Nova Scotian adolescents' preventative healthcare needs are being met by physicians. Health topics were examined as a sum scale as well as by domain; these domains were categorized as physical health, sexual health, substance use and psychosocial health. The extent of counselling provided was measured using an established guideline; the American Medical Association's Guidelines for Adolescent Preventative Services (GAPS). Factors such as gender and age were taken into account and analyses were conducted to determine the relative influence of sociodemographic factors and need on the provision of services. Finally the effect of having a school-based health centre on the extent of preventative health advice received was assessed.

Researchers have previously identified the importance of preventative health advice guidelines to ensure that appropriate services are provided, as well as the influence of several sociodemographic variables on both the risk behaviours students engage in and their receipt of preventative services (van Ryn and Burke, 2000; Gadomski et al., 2003; Langille et al., 2003; Ozer et al., 2005; Irwin et al., 2009). While some research has been conducted in Nova Scotia on the association of some socio-economic variables with students' involvement in health risk behaviours, less is known about the effect of these SES variables on the provision of preventative counselling to adolescents in the province (Langille et al., 2003). Furthermore, as a leader in the push for more school-based health services, Nova Scotia is an ideal location to ascertain the effect of these school-based health centres (SBHCs) on students' overall access to health promoting information.

Four research questions were created to answer the objectives of the research project. The study population had a good distribution of age, gender and grade and is representative of youth in the province of Nova Scotia. The comprehensiveness of the data collection for high schools in each region lends strength to the research. There was a high response rate amongst students present on the day of the survey (90%) and this allows for a more generalized interpretation of the research findings. This discussion chapter will elaborate

on some of the findings outlined in the results section and will tease out the major themes as well as draw links between these findings and the literature.

Although behaviour change does not necessarily follow the provision of advice, empowering adolescents with relevant health information may lead them to question their behaviours or seek out more information. As a result the provision of preventative health advice may have a positive impact on both the short and long-term health of youth (Flay 2002). Despite this, the results of this research show that overall preventative health advice is not well provided by physicians to adolescents in Nova Scotia. This gap in service delivery is not unique to the adolescent population; in the United States, preventative services on the whole are often not well delivered (Stange et al., 2000; Solberg et al., 2001). In Canada, this trend seems to remain the same however very little formal research has been conducted on the extent of preventative service delivery in the Canadian context. The phenomenon of low rates of preventative service delivery has been documented in several studies and efforts have been made to identify the barriers to the effective and comprehensive delivery of preventative services (Fiscella et al., 2002; Oscos-Sanchez et al., 2008). In an attempt to address these barriers and facilitate the provision of preventative health services, many guidelines have been created. Healthcare professionals are meant to be able to use these guidelines to ensure the regularity and comprehensiveness of their preventative counselling. GAPS have been endorsed by the AMA for use by physicians in their interactions with their adolescent patients. By providing physicians with a framework upon which to base their preventative counselling, GAPS aims to circumvent the potential time, availability of services and stigma-related barriers that may impede the provision of comprehensive preventative counselling (Montalto, 1998; Irwin, 2005; Oscos-Sanchez et al., 2008). The fact that the service delivery data gathered in the two questionnaires used here was based on the GAPS model, represents a strength of the research project in that it facilitates the analysis of the comprehensiveness of preventative counselling received by respondents. The recommendation has been made for physicians, in particular, to follow GAPS in all their interactions with youth between the ages of 11 and 21 years of age and in Canada the

Canadian Paediatric Society has declared its support of this directive (Canadian Family Physician).

The findings of the current research project show that although guidelines exist to inform and facilitate physicians' provision of preventative health services, their delivery of such care is not optimal. Only in the domain of sexual health counselling do physicians provide higher levels of advice but even these do not begin to approach levels recommended by GAPS. The analyses demonstrate that family physicians initiate most of the preventative advice provided by doctors but even so, the breadth and comprehensives of their counselling falls short of the guidelines. GAPS recommends that advice be provided to all adolescents regardless of age, gender or need but based on the findings of this research it seems that physicians let certain factors influence their provision of preventative counselling. The analyses show that when advice is provided it is given disproportionately to girls; across most topics and domains of advice, girls are provided significantly more advice than boys. This gender divide is most apparent when it comes to advice provided in the sexual health domain; in fact there are significant differences in the provision of sexual health advice; younger girls receive four times more advice than younger males and older girls receive six times more. Gender differences are least apparent in the domain of substance use counselling. Initial analyses also seemed to suggest that older students are provided more advice than younger students; later on however, this effect disappears when need is added into the predictive models.

As mentioned above, sexual health advice is the most consistently delivered domain of advice. This may be due to the fact that students receive PDR in school and are therefore more likely to bring these topics up with physicians, or perhaps, physicians are aware of the potential for harmful outcomes surrounding sexual health and therefore choose to focus on this advice (Tapert et al., 2001). Nevertheless, this finding of gender differences in the provision of preventative health advice presents certain problems: firstly, many of the health risk behaviours that female adolescents are involved in are inherently linked to, or engaged in at the same time, as those of their male counterparts and certainly, both

genders experience the negative health outcomes that may result from such behaviours. If one individual is being given advice and the other is not, this has the potential to render the prevention effort less effective. Therefore it is not sufficient to only sensitize half the youth population with information on these health risks and advice on how to avoid potentially harmful behaviours; preventative counselling should be provided equally to adolescents regardless of their gender.

Past research has shown that there are differences with respect to the provision of preventative services based on gender; physicians seem more inclined to provide sexual health advice to girls and substance use or physical health advice to boys (Keyl et al., 1996; Langille et al, 2001). Tabenkin and colleagues (2004) found differences, based on patient gender, in how physicians structured their preventative counselling visits and the information they focussed on. The majority of female patients' appointments were spent on physical examinations and emotional counselling while physicians tended to focus on health procedures and behaviour counselling for male patients (Tabenkin et al., 2004). This gender difference in the provision of preventative counselling may be driven by patients themselves; female adolescents may be culturally sensitized to advocate more for their health and to ask more questions while male adolescents may not feel comfortable accessing advice from female doctors. This study is limited by the fact that it was a secondary analysis and therefore, the variables and measures selected for investigation are limited to those that were asked about in the original survey questionnaires. Further research could focus on strategies to ensure that boys and girls get equal access to preventative health services. It may be interesting to investigate what influence, if any, physician gender has on the provision of preventative advice, as well as, to explore adolescents' reasons for accessing (or not accessing) healthcare.

The significance of the gender disparity in the provision of preventative health advice again comes into play when the interrelated nature of adolescent risk behaviours is considered. These behaviours must be addressed in a comprehensive manner so that both genders are aware of the potential health risks which their behaviours may incur and how these behaviours may be interconnected. The data from this research show that

physicians cover the topics and domains of advice inconsistently, which is in contrast to the philosophy behind comprehensive preventative care guidelines such as GAPS. This has a public health impact because adolescents may know the risks and be aware of the importance of prevention in one health domain but not realize the poor choices they make in another can affect many aspects of their health (Flay et al., 2002). For example they might know of the importance of condoms but be unaware of the potential of alcohol or drugs to negatively influence their decision making power and they may not plan ahead to protect themselves.

Referring once again to the sociodemographic predictors of adolescents being provided preventative health advice in accordance with GAPS, the initial data analysis (Model 1) indicates that youth from low socioeconomic status backgrounds are getting more preventative health advice. These findings, from both the unadjusted and adjusted analyses, show an effect that contradicts some of the literature on the topic; that adolescents from lower socioeconomic backgrounds would be provided less preventative health advice than adolescents from more well-off households (Fiscella et al., 2002; Irwin et al., 2009). Although the findings have not always been conclusive on this relationship, Irwin and colleagues (2009) found that being a U.S. adolescent from a low income background was significantly associated with not having received a preventative care visit in the past year and having less breadth of topics covered by physicians. In contrast, the present research study findings suggest that students with low sociodemographics are targeted by physicians in the provision of their preventative health advice. This could be understood as a positive thing in some contexts since it has been shown that being from low socioeconomic status families is a risk factor for increased engagement in risky behaviours (Langille et al., 2003; Langille et al., 2005). Findings such as this would mean that low socioeconomic students who were at risk for the negative health outcomes associated with risky behaviours might have more access to health advice that would help them to avoid these behaviours.

It should be noted that a limitation of the research project is that it is based on self-report data. Consequently, when interpreting the results, it should be noted that it is not certain

to what extent physicians are actually providing preventative advice since the analysis was completed using adolescents' self-report of the advice and services provided to them. There may be a disconnect between the amount of advice physicians themselves report they are providing and how much adolescents acknowledge receiving. In addition, this self-report limitation may threaten the validity of the measures as self-report tends to be associated with social-desirability bias. This may result in an overestimation or underestimation of behaviours or receipt of services and makes it difficult to draw conclusions.

In principle, targeting youth for counselling based on their socioeconomic status may be a beneficial approach to help them avoid negative health outcomes. However, disproportionately providing advice to low socioeconomic adolescents may mean that physicians miss the opportunity to counsel high socioeconomic youth who are planning to experiment with potentially risky behaviours because the physicians do not believe those youth are at risk. Despite the fact that GAPS recommends the provision of comprehensive preventative counselling to all adolescents between the ages of 11 and 21 irrespective of their sociodemographics, physicians have to contend with appointments that are already too short in length and they may resort to prioritizing students based on their perceived impressions of the students' risk statuses. Further research could look at less subjective ways to define being at risk and at the success of other predictors that physicians could rely upon to ensure that that they are reaching those most in need.

This research project aimed to investigate whether those adolescents who were truly "at risk" of negative health outcomes and thus in greater need of preventative counselling were being provided advice. Therefore a more objective measure of being "at risk" was created; it was defined as being "in need" and was composed of students who had "ever done" a risk behaviour. This was based on the hypothesis that these youth have an increased need for preventative counselling based on their risky behaviours and that youth who have never engaged in the risk behaviour are less in need of counselling.

The results of the second set of analyses (Model 2) showed that need is significantly associated with the provision of preventative health advice. After "need" was added into the model, it became apparent that need modifies the effect described above. Physicians were providing more advice to adolescents from low socioeconomic backgrounds but this may be more to do with the fact that they reported high levels of involvement in risky behaviours than with their socioeconomic status. Need appears to be an important factor driving the provision of advice; the addition of the need variable to each domain model diluted the strength of association of the sociodemographic variables originally identified as predicting the provision of advice. Some of these sociodemographic variables were dropped from the models while others weakened but remained significant in the model. Past studies have found age to be predictive of receiving or not receiving advice but the inclusion of need as a variable predicting the provision of advice seems to replace the effect of age, observed in earlier analyses of this data, for all domains of potential preventative health advice. The above changes had the effect of making need one of the strongest, if not the strongest predictor(s) of the provision of advice across domains.

Certainly, when individuals are in need of the delivery of a service, it is important to ensure that they have the opportunity to be provided this service. The results of the analyses above are encouraging in that they show that physicians are providing advice to those most in need and that in the absence of resources, like time, they are allocating what they can to those who stand to benefit the most. However, although these results confirm the research hypothesis that students with more need would receive more advice, the danger of these findings is that adolescent preventative counselling, in accordance with GAPS, is meant to be inclusive and preventative. If physicians are largely giving advice in response to a pre-existing need then this counselling is not proactive. The data shows that when physicians do provide advice it is done in a reactive manner. Since physicians appear often to be waiting until students are already at risk to provide health advice, this counselling is not preventative. This seems to provide more evidence for the importance of comprehensive preventative health advice guidelines since these would encourage the provision of counselling to all adolescents regardless of risk status (Montalto, 1998; Klein et al., 2001; Ozer et al., 2005). In fact Gadomski et al. (2003)

found that the implementation of GAPS in a rural pediatric clinic in New York State, significantly increased the comprehensiveness and consistency of physician provided adolescent preventative health care. It is worth noting that many of these research studies go on to suggest that other ways may still need to be sought out to both identify kids with the potential to be at risk and target them with advice tailored to their needs.

The cross-sectional nature of this dataset means that the interpretation of the results is limited. The data was not gathered longitudinally and this poses a limitation on the interpretation of results since inferences of a temporal order cannot be made on the effect of preventative counselling on adolescents' engagement in risk behaviours. It is not known whether or not the provision of advice is having a preventative effect. The study only examines the provision of advice to youth who were in need based on their self-report of risk behaviours. It is not possible to know whether adolescents who were at risk of being in need (ie. low socioeconomic status) but who had not yet engaged in risky behaviours, were provided preventative counselling and then this was subsequently affecting their behaviours. In addition, it is difficult to know whether kids who are in need get more advice because of their need (it may be that physician recognize risk characteristics in adolescents) or if students who practice these health behaviours advocate for themselves when visiting their physician. Certainly, healthcare providers should screen for both the socioeconomic predictors which put students at risk and the initiation of health behaviours that might make students more vulnerable.

To summarize, instead of being provided consistent, comprehensive, and preventative advice, for the most part, adolescents are not getting this type of counselling overall and when they are provided this advice it is based on their gender and their need for the advice. This means that above all the advice is not preventative, it is reactive; students are only provided health advice after they have put themselves at risk. Furthermore, it would then seem that physicians are not using the model for counselling that GAPS suggests. The objective of the GAPS framework, and other preventative health advice guidelines like it, is to facilitate service delivery by providing physicians with a structure upon which to model their counselling. The effectiveness of preventative health services

on the overall morbidity of a population has also been established (Elster and Levenberg, 1997; Ozer et al., 2003). If physicians in Nova Scotia are not adhering to GAPS and thus not providing optimal preventative health counselling, then this begs the question of whether there are specific barriers that prevent the uptake and implementation by physicians of such counselling guidelines.

Numerous studies have undertaken to investigate the determinants and barriers of physicians' use of and adherence to preventative counselling guidelines. Among the long list of barriers identified, time, or rather a lack of time has been shown to be a barrier in the delivery of physician services, especially in the delivery of preventative health services (Galuska et al., 2002; Yarnall et al., 2003). Physicians in Canada already have a limited amount of time to conduct their check-ups with patients and may not prioritize preventative care since the fee for service schedule does not facilitate billing for such services (Smith and Herbert, 1993). These check-ups are normally dominated by patients' immediate health concerns leaving physicians with little time to address potential long-term concerns or to advocate for preventative health behaviours (Galuska et al., 2002; Pollak et al., 2008). Preventative health counselling guidelines were meant to address this time barrier by giving physicians easy tools to ensure they addressed all preventative health topics relevant to their patients. However, as the popularity of preventative health services increased from a public health perspective, physicians found themselves inundated with these guidelines. In fact, in their study, Yarnall and colleagues (2003) found that in order to satisfy all of the U.S. Preventative Services Task Force's recommendations, physicians would need to dedicate 7.4 hours out of each of their work days to the delivery of these services. Therefore, it may not be realistic to demand that physicians fulfill the recommendations of every guideline. In fact, it seems that when physicians are pressured by time constraints they develop their own methods to provide preventative counselling and this may not always result in the most comprehensive delivery of services. In their 2002 study, Galuska et al., interviewed paediatricians from across the U.S. on the extent of their preventative counselling to their patients, aged 2-18, in accordance with established guidelines. They found that the paediatricians they interviewed reported selectively choosing to counsel their adolescent patients on some

topics but not others. The researchers went on to hypothesize that this prioritization was likely attributable to the time constraints inherent in the short visit times assigned to patients (Galuska et al., 2002). Notwithstanding the perceive time restrictions that physicians experience, some research has explored techniques to improve physician adherence to the delivery of comprehensive preventative counselling. Based on the results of a 2008 study examining the extent of preventative health topics covered by family physician residents in the Residency Research Network of Texas (RRNeT), Oscos-Sanchez et al. recommended capitalizing on the move to electronic health records by developing concurrent electronic reminder systems.

Despite this consideration, there is still evidence that preventative health guidelines can have a positive benefit on the health of adolescents and so it may be in the interests of public health promotion specialists to explore alternative methods of providing this preventative counselling and compensate where physician are leaving a gap.

School-based health centres (SBHCs) have been posited as a possible solution to this problem. The research findings show that students in schools with school-based health centres report being provided more physician provided preventative health advice than students without these centres (Model 3). This would support the hypothesis that there is a community catalytic effect of having a SBHC within the school. Students at these schools may receive or pick up information on health risks and then use this information to advocate for themselves while visiting their physician. They may realize they are at risk and then ask questions which prompt the physician to target them with specific health advice. These findings are in line with previous research on the topic. Kisker and Brown (1996) found a significant effect of the presence of a SBHC on the health outcomes of adolescents. Students with access to these types of facilities in school were more likely to visit a healthcare provider when not in school. Correspondingly, in their study of students in grades 6-12 at schools across Baltimore, Santelli et al. (1996) came to the conclusion that students with access to a SBHC had increased use of primary care and counselling services. Two years later, Kaplan and colleagues (1998) conducted a similar research study and found that presence of a SBHC was not only associated with

greater likelihood of seeing a medical professional outside of the school environment, but also, with less need for emergency care. Allison and colleagues (2007) updated these findings when, in their cohort study of Denver, Colorado-based high-school students, they found SBHC users to be both more likely to have made primary care visits and less likely to have visited an emergency department. Interestingly, gender differences have been found in students' likelihood of using SBHC services; male adolescents are much less likely than female adolescents to use the services provided through SBHCs (Anglin et al., 1996; Pastore et al., 1998; Coyne-Beasley et al., 2003; Langille and Rigby, 2006; Langille et al., 2008). It is possible that rather than benefiting directly from the increased accessibility of services available at the SBHC, male adolescents who attend schools with a SBHC are experiencing its indirect effect and consequently being provided more preventative counselling than males in schools without a SBHC. Finally, it should be noted that the results seem to indicate that there is less benefit to girls in terms of SBHC. The presence of a SBHC is only significantly associated with more preventative health counselling to girls in one domain – that of physical health. It may be that there is some sort of "ceiling" effect for adolescent girls with regard to preventative health counselling; perhaps they are being inundated with health advice and as a result the presence of a SBHC does little to increase the amount of preventative counselling they are exposed to or seek out with a physician. Despite this possible explanation, clearly this is a complex issue and one which cannot be explained without further investigation and research.

When looking at the association of the presence of a school-based health centre and the extent of preventative counselling provided, the problem of clustering must be considered. It may be that those schools in the current study which had school-based health centres were also in more affluent towns with more doctors available or in towns that were less religious, facilitating frank conversations around adolescent sexual, physical and substance use risk behaviours. Therefore clustering is one potential shortcoming of studying the effect of SBHC presence on the provision of counselling. Essentially, there are additional contextual effects inherent to the community and outside of the school environment (i.e. community affluence) which may be partially responsible for the effect of SBHC in the results. There may be broader ecological forces at play

which are unmeasured in the present study. This is important to keep in mind when drawing conclusions about the effect of the presence of SBHC on physician provided preventative counselling.

Similarly, some caution should be applied to making assumptions as to the generalizability of the results of this research study outside of the province of Nova Scotia. Although the study sample was representative of the region due to the fact that the data was gathered from both rural and demographically distinct regions of Nova Scotia it may be that these results would not be replicable for other Canadian adolescent populations.

Despite these concerns, the observed associations of presence of a SBHC with increases in access to preventative health counselling are worth further consideration and extrapolation. In the absence of optimal physician provided preventative health advice and acknowledging the barriers of time and human resources, SBHCs may prove to be an ideal solution to the service provision gaps in adolescent preventative healthcare. SBHCs have had demonstrated success with reaching adolescents with public health promotion and prevention efforts and if properly supported and they may provide a location for the delivery of truly beneficial preventative services.

CHAPTER 7.0 CONCLUSION

The results of this research have practical applications including the creation of policies aimed at addressing the gaps in preventative service provision for adolescents, the renewal of emphasis on preventative counselling techniques and provision in medical and nursing training programs and the consideration of alternate systems for the delivery of such services.

There are distinct sociodemographic variables which may act as risk or protective factors to adolescents' comprehensive receipt of GAPS recommended preventative counselling. Physicians, other healthcare professionals, and educators alike should be sensitized to these predictors so as to be able to target youth who may be at risk for not being provided this counselling. Similarly, being in need for specific preventative health advice seems to influence the provision of preventative health advice. Since very little is known about the temporal nature of this effect, it would certainly be of value to reaffirm with physicians the need to screen all adolescent patients and provide them with preventative health advice.

Two strategies could be implemented to try and improve physician adherence to GAPS. Perhaps if physicians in training were made more aware of the importance of comprehensive preventative health counselling as well as the positive long-term impact of such care, they would prioritize the incorporation of preventative health services into their practice. Emphasis should be placed on preventative health counselling training in medical school curriculums across the country and students should be made familiar with the various preventative advice guidelines available to them (including GAPS).

School-based health centres may have a positive effect on the overall extent of preventative health services provided to adolescents by exposing them to information on the potential health hazards they may experience. Access to this information could help adolescents advocate for themselves in terms of health services and delivery when they visit a non-SBHC health professional. Furthermore, given the evidence that physician

visits may not be the ideal place for adolescents to receive comprehensive preventative counselling, due to time constraints among other things, school-based health centres may prove to be an excellent alternative location for the delivery of these services. This information will certainly be of use to the planning and provision of school-based health services, which are well developed in Nova Scotia, and present in many schools. In addition, these results can be used to advocate on behalf of the scale-up of such programs and services.

The integration of the study findings into Nova Scotian healthcare policy and provision has real potential to have a very positive impact on the health of Nova Scotian adolescents. To conclude, this study is an important step in the way forward to comprehensive preventative services for the youth of Nova Scotia.

APPENDIX I – Demographic Characteristics of the Study Regions

Demographic Characteristic	Cumberland County	Colchester County	Pictou County	Cape Breton County	Provincial Average
Total Population	32,605	49,307	46,965	105,928	908,007 (2001) 913,462 (2006)
Median Age (yrs)	42.3	39.3	40.3	44.3	38.8 (2001) 41.8 (2006)
Primary Language: % English	98	97	97	95	93
Marital Status: % Married	51	53	52	47	51
Major Religion: % Protestant and Catholic	65 – Prot. 19 – Cath.	66 – Prot. 16 – Cath.	57 – Prot. 31 – Cath.	30 – Prot. 65 – Cath.	49 – Prot. 37 – Cath.
Median Household Income ($)	33,210	37,068	36,937	36,550	39,908
Education: % with < high school graduation certificate: Ages 20-34	22.7	21.4	17.9	18.0*	16.1
Ages 35-44	29.0	28.6	24.7	26.4*	23.0
Ages 45-64	37.0	36.9	36.5	40.5*	33.7
% unemployed	13.4	9.9	15	19.7	10.9

*N.B. Educational statistics for Cape Breton County were taken from the 2001 Census instead of the 2006 in order to maintain consistency between age categories.

APPENDIX II – Overview of GAPS Domains and Prevention and Health Promotion Topics

The prevention of:	**The promotion of:**
Abuse of tobacco, alcohol and other drugs	Healthy diet (obesity; eating disorders)
Physical, sexual or emotional abuse	Injury prevention
Mental health issues and suicide	Physical fitness
Negative sexual health outcomes	Healthy psychosexual adjustment
	Adjustment to puberty and adolescence

APPENDIX III – Categories and Domains of GAPS Mapped Onto Survey Domains and Questions

GAPS Category	GAPS Domain	Survey Domains	Survey Questions – "Has a physician spoken to you about this issue?"
Physical Health		**Physical Health Advice**	
	Promotion of physical fitness; prevention of obesity	Exercise	*How much you exercise?*
	Promotion of healthy diet; prevention of eating disorders	Healthy Diet	*Healthy diet?*
	Prevention of physical abuse	Healthy Weight	*Healthy weight?*
Sexual Health		**Sexual Health Advice**	
	Preventing negative sexual health outcomes	Being Sexually Active	*Being sexually active?*
		Using Condoms	*Using condoms?*
		Preventing STIs	*Preventing sexually transmitted infections?*
		Preventing HIV	*Preventing HIV infection?*
	Preventing sexual abuse	Avoiding Pregnancy	*Avoiding pregnancy?*
	Promotion of healthy psychosexual adjustment	Sexual Orientation	*Sexual orientation?*
Substance Use		**Substance Use Advice** (combined Substance Use and Risky Behaviour)	
	Prevention of tobacco abuse	Smoking	*Smoking?*
	Prevention of drug abuse	Using Drugs	*Using drugs?*
	Prevention of alcohol abuse	Using Alcohol	*Using alcohol?*
Risky Behaviour	Promotion of injury prevention	Driving Under The Influence	*Drinking/using drugs and driving?*
Mental Health		**Psychosocial Health Advice** (combined Mental Health and Psychosocial Health)	
	Prevention of mental health issues and suicide	Mood/Level of Happiness	*Your mood/level of happiness?*
Psychosocial Health	Promotion of adjustment to puberty and adolescence	School Performance	*How you are doing in school?*
	Prevention of emotional abuse	Family Relationships	*Family relationships?*
* Based on an initial background document on survey development. Langille et al. (2006)			

APPENDIX IV: Need Based Responses to Survey Questions

Health Domain	**Question**	**"In Need" Response**
Physical Health	"Which of the following are you trying to do about your weight?"	"lose" and "gain"
Sexual Health	"Have you ever had vaginal sex?"	"yes"
Substance Use	"During the past 30 days, on how many days did you drink 5 or more drinks of alcohol?"	">0"
	"During the past 30 days, on how many days did you smoke cigarettes?"	">0"
	"During the past 30 days, on how many days did you use marijuana?"	">0"
Psychosocial Health	Depression scale	"at risk for depression"

APPENDIX V – Survey Questions Used by Category

The extracted questions used in the analyses are contained in the following table:

Category	Survey Question Used
Sociodemographic Factors	"What is your age in years?"
	"What was your average mark in school this past year?
	"Are you male or female?"
	"What grade are you in?"
Socioeconomic Status	"Who do you live with?
	"What is the highest level of education completed by your mother/father/guardian?"
	"Is your mother/father/guardian employed at the present time?"
	"How well off do you think your family is compared to other teens in your school?"
Sexual Health	"Have you ever had vaginal sex"
Substance Use	"Have you ever tried cigarette smoking, even one or two puffs?"
	"During your life, on how many days have you had at least one drink of alcohol?"
	"During your life, how many times have you used marijuana?"
	"During the past 30 days, on how many days did you smoke cigarettes/drink alcohol/use marijuana?"
Physical Health	"How would you describe your weight?"
	"Which of the following are you trying to do about your weight?"
Psychosocial Health	At risk for depression
	Marks < 70%
Health Advice	"In the past year, has anyone (family doctor or another doctor) spoken to you individually about the various health issues or concerns listed below?" :
	"How much you exercise?"
	"Healthy diet?"
	"Healthy weight?"
	"Being sexually active?"
	"Using condoms?"
	"Preventing sexually transmitted diseases?"
	"Preventing HIV infection?"
	"Avoiding pregnancy?"
	"Sexual orientation?"
	"Smoking?"
	"Using drugs?"
	"Using alcohol?"
	"Drinking/using drugs and driving?"
	"Your mood/level of happiness?"
	"How you are doing in school?"
	"Family relationships?"

APPENDIX VI – Power Calculation

Adequate power to address the research questions was unlikely to be a concern given the sample size (N=3,732). However, in order to be fastidious, it is useful to calculate the least detectable odds ratios. The fixed total sample size for the pooled dataset made it possible to calculate the least detectable odds ratios (LDORs) using the StatCalc function of EpiInfo (Version 6).

Calculations were made using research question two as an example (see table below) and assumed an unmatched cohort design. The fixed sample size was determined by dividing the total sample size (N=3,732) by two to account for sex (boys=1,866, girls=1,866) and then subtracting 25% to account for the possible effects of clustering by school site; making the final sample size approximately 1,400 for each sex.

For research question two, the hypothesis is that students with low SES receive less preventative counselling than students with high SES. Thus, the exposed group is adolescents with high SES and the unexposed is those with low SES. Given what is known about this topic in Nova Scotia, the best case scenario for the provision of sexual health preventative advice to male adolescents is on average 7% and the best case for female adolescents is approximately 27% (Langille et al., 2001). In order to estimate the LDORs closest to the fixed sample size for each gender, these calculations were done twice; once using a ratio unexposed:exposed of 2:1 and once using a ratio of 3:1.

The following table demonstrates the least detectable odds ratios that it possible to comment on the smallest difference in the provision of preventative counselling which the proposed study has the power to detect given the fixed sample size of n=1,400.

Research Question Two - *What Sociodemographic Factors of Adolescents Predict the Provision of Preventative Advice to Them?*

Ratio	Gender	Expected frequency of preventative counselling in students with low SES	Percent preventative counselling among students with high SES	Smallest detectable difference in the provision of preventative counselling b/w high SES and low SES students	Least Detectable Odds Ratio (LDOR); given fixed sample size 1,400 for each sex.
2:1 (unexp:exp)	Male	7%	11.7%	4.7%	1.76
	Female	27%	34.4%	7.4%	1.42
3:1 (unexp:exp)	Male	7%	12.1%	5.1%	1.83
	Female	27%	35.1%	8.1%	1.46

APPENDIX VII

Codebook: Merged Dataset

Q #	*Question*	*Variable Name*	*Coding*
	Questionnaire number (assigned in cleaning)	QUESNO	4 digits
School	Site	SITE	1 = Am; 2 = Tr; 3 = NG; 4 = WP 5 = GBHS; 6 = SA 7= MCHS
Section 1: Personal Background			
1.1	Are you male or female?	gender	1 Male 2 F emale
1.2	What is your age in years?	age	2 digits (15-19 years)
1.3	What grade are you in?	grade	2 Grade 10 3 Grade 11 4 Grade 12
1.4	What was your average mark in school last year?	avgmark	1 less than 50 2 50-5 9 3 60-6 9 4 70-7 9 5 80-8 9 6 90-1 00
1.5	Who do you live with?	wholivnew	1 mother & father 2 mother only 3 other living arrangement
1.6a	Mother's Education	mothedu	1 high school or less 2 post-seco ndary 3 other 4 don 't know
1.6b	Father's Education	fathedu	1 high school or less 2 post-seco ndary 3 other 4 don't know
1.7a	Is your mother employed at the present time?	mothjob	1 yes 0 no 3 don 't know 4 not applicable
1.10	How important would you say religion is to you?	relimp	1 not important at all 2 not very important 3 fairl y important 4 ver y important
Section 2: Health Advice			
2.1a	Spoken with anyone about **exercise**	exerc3	1 yes /0 no
	Who- family doctor about exercise	exfdr3	1 yes / 0 no
	Who- other doctor about exercise	exodr3	1 yes / 0 no

Q #	*Question*	*Variable Name*	*Coding*
2.1b	Spoken with anyone about **healthy diet**	diet3	1 yes / 0 no
	Who- family doctor about diet	dietfdr3	1 yes / 0 no
	Who- other doctor about diet	dietodr3	1 yes / 0 no
2.1c	Spoken with someone about **healthy weight**	wght3	1 yes / 0 no
	Who- family doctor about weight	wgtfdr3	1 yes / 0 no
	Who- other doctor - weight	wgtodr3	1 yes / 0 no
2.1d	Spoken with someone about **being sexually active**	sexact3	1 yes / 0 no
	Who - family doctor - sexually active	sactfdr3	1 yes / 0 no
	Who - other doctor - sexually active	sactodr3	1 yes / 0 no
2.1e	Spoken with anyone about **using condoms**	condom3	1 yes / 0 no
	Who - family doctor - using condoms	condfdr3	1 yes / 0 no
	Who - other doctor - using condoms	condodr3	1 yes / 0 no
2.1f	Spoken with someone about **preventing STI's**	prevstd3	1 yes / 0 no
	Who - family doctor - preventing STI's	stdfdr3	1 yes / 0 no
	Who - other doctor - preventing STI's	stdodr3	1 yes / 0 no
2.1g	Spoken with someone about **preventing HIV**	prevhiv3	1 yes / 0 no
	Who - family doctor - preventing HIV	hivfdr3	1 yes / 0 no
	Who - other doctor - preventing HIV	hivodr3	1 yes / 0 no
2.1h	Spoken with someone about **avoiding pregnancy**	preg3	1 yes / 0 no
	Who - family doctor - avoiding pregnancy	pregfdr3	1 yes / 0 no
	Who - other doctor - avoiding pregnancy	pregodr3	1 yes / 0 no
2.1i	Spoken with someone about **sexual orientation**	sxorien3	1 yes / 0 no
	Who - family doctor - sexual orientation	sxorfdr3	1 yes / 0 no
	Who - other doctor - sexual orientation	sxorodr3	1 yes / 0 no
2.1j	Spoken with someone about **smoking**	smoke3	1 yes / 0 no
	Who - family doctor - smoking	smkfdr3	1 yes / 0 no
	Who - other doctor - smoking	smkodr3	1 yes / 0 no
2.1k	Spoken with someone about **using drugs**	drugs3	1 yes / 0 no
	Who - family doctor - using drugs	drugfdr3	1 yes / 0 no
	Who - other doctor - using drugs	drugodr3	1 yes / 0 no
2.1l	Spoken with someone about **using alcohol**	alcohol3	1 yes / 0 no
	Who - family doctor - using alcohol	alcfdr3	1 yes / 0 no

Q #	*Question*	*Variable Name*	*Coding*
	Who - other doctor - using alcohol	alcodr3	1 yes / 0 no
2.1m	Spoken with someone about **drinking/using drugs and driving**	drdriv3	1 yes / 0 no
	Who - family doctor - DUI	drivfdr3	1 yes / 0 no
	Who - other doctor - DUI	drivodr3	1 yes / 0 no
2.1n	Spoken with someone about **mood/level of happiness**	mood3	1 yes / 0 no
	Who - family doctor - mood	moodfdr3	1 yes / 0 no
	Who - other doctor - mood	moododr3	1 yes / 0 no
2.1o	Spoken with someone about **how doing in school**	school3	1 yes / 0 no
	Who - family doctor - school	schfdr3	1 yes / 0 no
	Who - other doctor - school	schodr3	1 yes / 0 no
2.1p	Spoken with someone about **family relationships**	famrel3	1 yes / 0 no
	Who - family doctor - family relationships	frelfdr3	1 yes / 0 no
	Who - other doctor - family relationships	frelodr3	1 yes / 0 no
Section 3: Sexual Behaviour			
3.1	Have you ever had vaginal sex	q4vagin3	1 Yes 0 No
Section 4: Substance use			
4.1a	Ever tried smoking, even one or two puffs	q9smoke3	1 yes 0 no
4.1b	How many days smoked cigarettes (past 30 days)	q9daysm3 1	0 days 2 1 or 2 days 3 3 to 5 days 4 6 to 9 days 5 10 to 19 days 6 20 to 29 days 7 all 30 days
4.2a	Have you ever had a drink of alcohol? (life)	q9drink3	1 Yes 0 No
4.2b	How many days have at least 1 drink (30 days)	q9daydr3	1 0 days 2 1 or 2 days 3 3 to 5 days 4 6 to 9 days 5 10 to 19 days 6 20 to 29 days 7 all 30 days

Q #	*Question*	*Variable Name*	*Coding*
4.3	During the past 30 days, on how many did you have 5 or more drinks of alcohol in a row?	q9binge3	1 0 days 2 1 day 3 2 days 4 3 to 5 days 5 6 to 9 days 6 10 to 19 days 7 20 or more days
4.4a	Have you ever tried marijuana (life)	q9pot3	1 Yes 0 No
4.4b	How many times used marijuana (30 days)	q9pot30d3	1 0 times 2 1 or 2 times 3 3 to 9 times 4 10 to 19 times 5 20 to 39 times 6 40 or more times
Section 5: Body weight			
5.1	How do you describe your weight?	q11weig3	1 very underweight 2 slightl y underwgt 3 about the right wgt 4 slightl y overwgt 5 ver y overweight
5.2	Which of the following are you trying to do about your weight?	q11tryw3 1	lose weight 2 gai n weight 3 stay the same 4 not trying to do anything
Section 6. Depression			
6.1	At risk for depression (males greater than or equal to 22; females ge 24 as cut-offs)	riskdep3	1 at risk 0 not at risk
Section7. Generated Variables			
Q #	*Question*	*Variable Name*	*Coding*
7.2	Perceived SES (how welloff?)	perc_welloff	1 welloff 2 average 3 not welloff
7.3	School-Based Health Centre	sbhc	1 yes 0 no
7.4	Advice received from any MD (all 16 topics)	exmd dietmd, etc.	1 yes 0 no
7.5	Advice received from other (phn, sgc, mhc, dds) for all 16 topics	exoth dietoth, etc.	1 yes 0 no
7.6	Domains of advice (physical, sexual, drug, psyc) “did you receive advice in this domain?”	phyhealth 1	yes 0 no
		sexhealth 1	Yes 0 No

Q #	*Question*	*Variable Name*	*Coding*
		drughealth 1	Yes 0 No
		psychealth 1	Yes 0 No
7.7	Is religion important to you?	relimpnew	1 yes 0 no
7.8	Do you attend religious services frequently?	relignew	1 Yes (Once/week to once/month) 0 No (Few times a year or never)
7.9	School performance	mark_new	1 High (≥ 80%) 2 Middle (70-79%) 3 Low (≤ 69%)
7.10	Age (dichotomized)	agenew	1 younger (15&16) 2 older (17, 18 &19)
7.11	Mother education (dichotomized)	mothedu_edit	1 high school or less 2 post secondary
7.12	Father education (dichotomized)	fathedu_edit	1 high school or less 2 post secondary
7.13	Mother Job (dichotomized)	mothjob_edit	1 Yes (employed) 0 No (unemployed)
7.14	Father Job (dichotomized)	fathjob_edit	1 Yes (employed) 0 No (unemployed)
7.15	Score (added all advice questions)	score	0→16
7.16	Living arrangement – fixed *Stata automatically made these continuous. Changed to categorical when realized mistake*	wln 1, 2 and 3	1=live with both, 2= live with mom and 3=other living arrangement
	Perceived SES – fixed	pwo 1, 2 and 3	1= well-off, 2=average, 3=not well-off
	Average Marks – fixed	mn 1, 2 and 3	1=high marks, 2=middle, 3= low
7.17	Need (physical, sexual, drug, psychosocial) "ever do" or "current use"	physneed sexneed drugneed psycneed	1=yes 0=no
7.18	Current Pot Use (>0 in a month)	mj	1=yes 0=no
	Current Cigarette Use (>0 in a month)	smokecig 1=	yes 0=no
7.19	More than experimental alcohol use - binge drink>0 per month (binge=5 drinks or more)	binge 1=	yes 0=no
7.20	Year	year	2003 or 2006

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