

## **Trends in Healthy Development and Healthy Relationships**

### **Trends Analysis of Canadian Data from the Health Behaviour in School-Aged Children (HBSC) survey from 2002, 2006, and 2010**

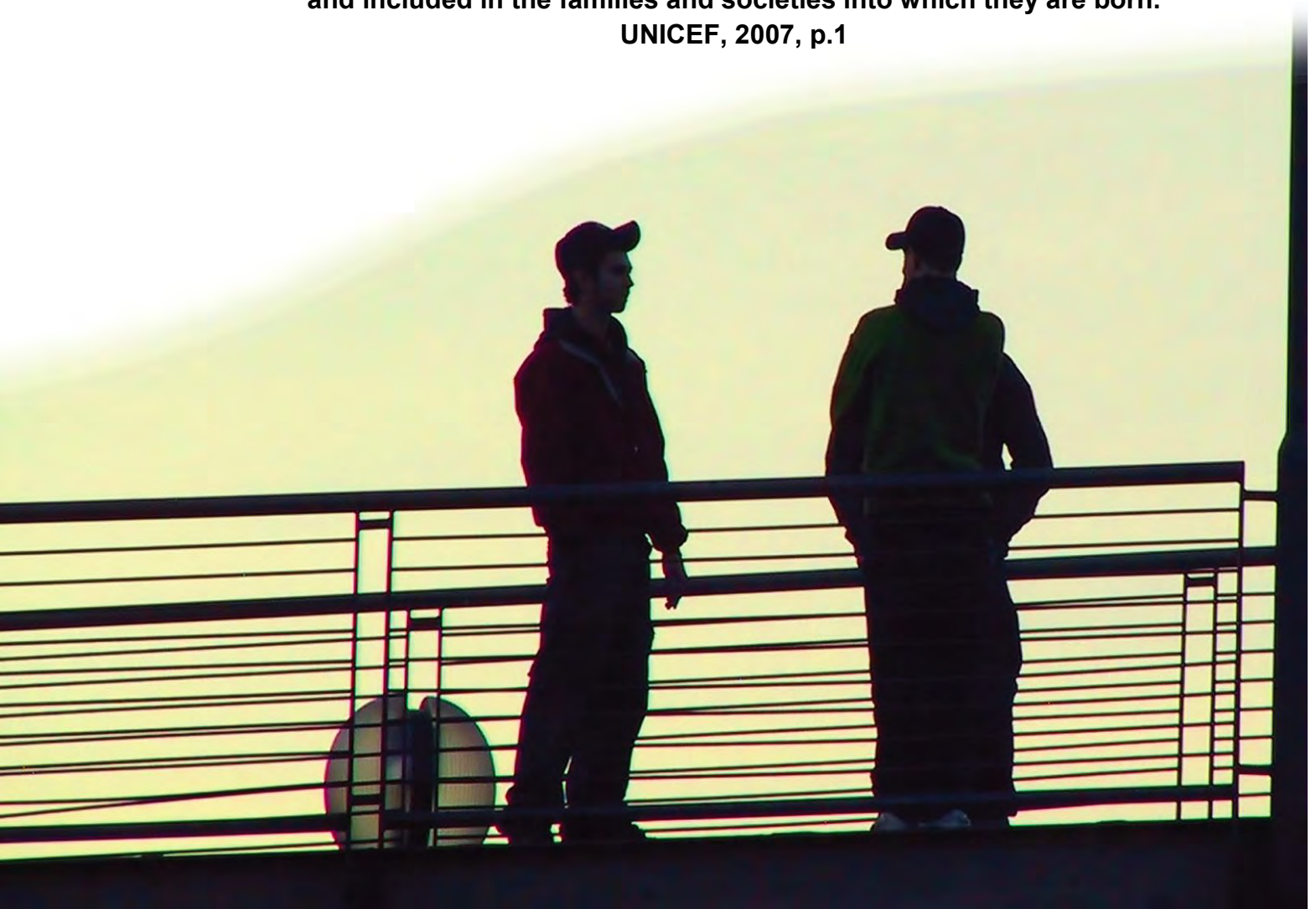
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**The true measure of a nation's standing is how well it attends to its  
children – their health and safety, their material security, their  
education and socialization, and their sense of being loved, valued,  
and included in the families and societies into which they are born.**

**UNICEF, 2007, p.1**



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## Executive Summary

This project follows our *Healthy Development Depends on Healthy Relationships* report (Pepler, Craig, & Haner, 2012). In that report, we used data from the cross sectional study of the Health Behaviour in School-aged Children (HBSC) survey to demonstrate that relationships matter in terms of the health behaviours of young people. The findings confirmed our hypothesis that parent, peer, school, and neighbourhood relationships were linked to the health and well-being of children and **youth. Canada's children** need healthy relationships for their healthy development. Healthy relationships are those that help children feel valued, support them to learn a wide range of skills, and do not add stress to their lives, but help to buffer the stresses they inevitably encounter.

The goal of the current project was to examine trends in the association of relationships to health behaviours between 2002, 2006 and 2010 using the HBSC survey data from Grades 6, 7, 8, 9, and 10 gathered during the three cycles. Each survey is a comprehensive questionnaire collecting data on six domains of health and wellbeing including: physical health, healthy lifestyle, emotional health, **aggression, substance use, and sexual behaviour. The survey also includes questions about students'** relationships including those with parents, peers, school, and the neighbourhood.

### Trends in Quality of Relationships

There was a general decrease in the proportion of youths who reported a high quality relationship with their parents, with their schools, and with their neighbourhoods from 2002 to 2010. In contrast, the proportion of youths who reported a high quality relationship with peers was stable.

### Trends in the Association of Quality of Relationships and Health Behaviours

Injuries. The likelihood of injuries was only linked to the quality of parent relationships across all three cycles. A higher quality relationship with parents was associated with fewer reports of injuries.

Overall health. The quality of peer and neighbourhood relationships was significantly associated with overall health across all three cycles, with higher quality relationships linked to better overall health. For both peer and neighbourhood relationships, the link was more pronounced for girls than for boys.

Overweight/obesity. There was no consistent relationship over time between body mass index and the quality of **students'** relationships with their parent, peers, school, and neighbourhood.

Healthy Eating. Although they were associated within some time periods, there were inconsistent patterns across cycles and relationships in the links to healthy eating for parent, peer, and school relationships. In contrast, the quality of **students'** relationships within their neighbourhood was associated with healthy eating consistently across all three cycles.

Physical Activity. Generally, males were more likely to be physically active than females. Although there were associations, there were inconsistent patterns across the cycles in the links between the

quality of parent and school relationships and physical activity. In contrast, the quality of peer and neighbourhood relationships was consistently related to physical activity across all three cycles.

Quality of Life. In all survey cycles, positive relationships with parents, peers, schools, and within the neighbourhood were associated **with youths' reports of a higher quality of life. Over time, there has** been a drop in the proportion of youths reporting a high quality relationship.

Psychosomatic Symptoms. In general, females tended to report more psychosomatic symptoms than males, and youth tended to report more psychosomatic in 2006 and 2010 than in 2002.

Mental Health. **Adolescents' reports of good mental health** declined steadily from 2002-2010. Males generally reported better mental health than females. In all cycles, having positive relationships with parents, peers, schools, and in neighbourhoods was associated with higher levels of mental health.

Bullying Others. Over time, both males and females reported engaging in more bullying behaviour, a pattern that was most marked for those who had a low quality parent relationship. Quality of relationships with parents was consistently and inversely related to reports of bullying, but peer and school relationships were inconsistently linked. Males reported more bullying than females.

Victimization. There was a significant increase in the prevalence of victimization, especially from 2006 to 2010. The quality of relationships with both parents and peers was associated with less victimization across all three data cycles.

Fighting. Physical fighting was most common in 2006, and males were more likely to report physical fighting than females. High quality relationships with both parents and schools were protective against being involved in physical fights across all three cycles. The quality of relationships with **parents and schools was more strongly linked to females' than to males' fighting.**

Smoking Tobacco. The rates of smoking reported by youth have steadily declined from 2002 to 2010. Across all three cycles, high quality parent and school relationships were protective against the risk of smoking and this link was stronger for females than for males.

Drinking Alcohol. Rates of alcohol consumption among Canadian adolescents increased from 2002 to 2006 and then dropped to the lowest point in 2010. The quality of both parent and school relationships was associated with less drinking, and the link was stronger for females than for males. In contrast, the quality of **adolescents' relationships with their** peers and neighbourhood was associated with more drinking, with a stronger trend for males.

Smoking Cannabis. Rates of cannabis use declined steadily from 2002 to 2010. Only the quality of parent relationships was consistently related to lower cannabis use. The quality of peer and school relationships was negatively related to cannabis use in 2006 and 2010, but not 2002. Over 25% of

youth report smoking cannabis in 2010, hence Canada remains the country with the highest rate of youth cannabis use among 29 European and North American countries (UNICEF 2013).

Hard Drug Use. **In the HBSC survey, the** quality of relationship with parents was the only factor consistently and inversely related to hard drug use.

Sexual Activity. **The** quality of relationships with schools was the only factor consistently related to a lower likelihood of having sexual intercourse.

This project provided an opportunity to study trends in Canadian **youths' relationships and the links** to health behaviours over this period of vast transformation. An understanding of stability and change in these links will provide direction for health promotion and policy development. The challenge for Canada is that fewer youth in 2010 were experiencing high quality relationships with their parents, schools, and neighbourhoods. It follows, therefore, that fewer students may experience the health benefits linked to positive relationships. One strategy to promote children and **youths' healthy development is to focus on improving the quality of all important relationships and** the practices of all adults involved in the lives of children. The discussion of implications of the observed trends and associations has been organized under four potential strategies: education and training, assessment and evaluation, prevention and intervention, and policy.

## Introduction

In the 2013 UNICEF report, Canada ranked 2<sup>nd</sup> of 28 developed countries on educational achievement, which indicates that most of our children are faring relatively well in reading, math, and science achievement. Compare that to our ranking of 25<sup>th</sup> of 28 countries on the quality of our **children's relationships with parents and peers**. This project follows our *Healthy Development Depends on Healthy Relationships* report submitted to the Public Health Agency Canada in November of 2012 (Pepler, Craig, & Haner, 2012). In that report, we used data from the cross sectional study of the Health Behaviour in School-aged Children (HBSC) survey to demonstrate that relationships matter in terms of the health behaviours of young people. With the exception of one of **24 behaviours (use of birth control), students' high quality, positive relationships with their parents, peers, schools and within their neighbourhoods** were related to a reduced likelihood of negative health behaviours and/or an increased likelihood of positive behaviours. Furthermore, the findings confirmed our hypothesis that several types of relationships relate to the health and well-being of **children and youth**. **Canada's children** need healthy relationships for their healthy development. Healthy relationships are those that help children feel valued, support them to learn a wide range of skills, do not add stress to their lives, but help to buffer the stresses they inevitably encounter, and do not add stress to their lives.

The results of the *Healthy Development Depends on Healthy Relationships* report indicated that:

1. All relationships measured in the HBSC are linked to healthy development in some way, although they differ in terms of which health behaviours they are associated with.
2. Healthy relationships are important for both males and females, but often in different ways.
3. A positive parent relationship is most consistently linked to positive health behaviours for children and youth.
4. Positive relationships within the neighbourhood are also associated with healthy development and provide an important context in which children and youth grow up.

The trends in the health behaviours reported by students on the HBSC have been analysed and reported (Freeman, King, & Coe, in press). The goal of the current project was to examine trends in the association of relationships to health behaviours between 2002, 2006 and 2010 using the HBSC data from those years. Although we have clearly demonstrated these associations for the 2010 data, it was important to examine:

1. The extent to which these links are evident at each cycle of the HBSC survey and
2. How the links between relationship quality and health behaviours have changed or remained stable over time.

There have been marked changes in the lives of children and youth over the past decade. The most notable of these has been the overwhelming growth of social networking. MySpace began in 2004, Facebook in 2006 and Twitter in 2007 (Search Engine Journal, 2013). Now youth report that they communicate with friends more frequently through electronic means than in face-to-face interactions (Nie, Hillygus, & Erbring, 2002; Kowalski, Limber, & Agatson, 2012). The access to electronic communication and interaction through Internet forums, interactive games, social media networks, and texting has presented increased opportunities for social interactions among youth, as well as increased risks of bullying and exploitation (Blais, Craig, Pepler, & Connolly, 2008; Palfrey & Gasser, 2010). **This project provided an opportunity to study trends in Canadian youths' relationships and the links to health behaviours over this period of vast transformation.** An understanding of stability and change in these links will provide direction for health promotion and policy development.

## **Method**

### **Data Collection**

Data for these analyses were drawn from the 2001-2002, 2005-2006 and 2009-2010 Canadian Health Behaviour in School-Aged Children (HBSC) surveys. Each survey is a comprehensive questionnaire collecting data on health and well-being behaviours, representing diverse information on areas of health such as physical health, healthy lifestyle, emotional health, aggression, substance use, and sexual behaviour. **The survey also includes questions about students' relationships including those with parents, peers, school, and the neighbourhood.** These questions formed the basis of the health behaviour measures and relationship quality scales.

There were two versions of the questions: one for students in Grades 6-8 and another for students in Grades 9 and 10. Parental consent was obtained from children under the age of 18 prior to collecting data.

### **Participants**

For each survey, schools were selected using a weighted probability technique to ensure that different regions and demographics were represented. Classes within schools were chosen by a similar technique to ensure that students were equally likely to participate.

See Table 1 for a summary of demographics for each of the three cycles of the survey. Please note that the 2010 survey had substantially more participants. No demographic information with respect to age and ethnicity was collected in 2006.

Table 1: Demographic Information for 2002, 2006, and 2010

	<b>2002</b>	<b>2006</b>	<b>2010</b>
Number of Survey Participants	7,235	9,717	26,078
Sex: Males	46%	47%	48%
Females	54%	53%	52%
Mean age in years	NA	14	14
Ethnicity		NA	
White	86%	--	72%
Chinese	3%	--	6%
South Asian	2%	--	6%
Black	2%	--	0%
Filipino	1%	--	0%
Latin American	1%	--	0%
Southeast Asian	1%	--	3%
Arab	1%	--	0%
Aboriginal	1%	--	6%
Metis	1%	--	0%
Other	1%	--	7%
Students with a single parent (either mother or father)	27%	32%	27%

NA = Not Available as data were not collected

## Measures

Factor analyses were run using the Statistical Package for the Social Sciences (SPSS) software program to ensure that all relationship and behaviour scales had items that assessed a common underlying construct (see Appendix 1 for full details).

### *Relationship Scales*

Four types of relationship were identified for analysis in all three HBSC surveys. The relationships are:

1. Parent
2. Peer
3. School
4. Neighbourhood

The scales assessed the quality of relationship. The measures of relationship quality for each scale were based on relevant questions in the HBSC survey. For example, questions about relationships with parents were analysed to create a Parent Relationship Quality Scale. Any item that asked about a negative quality was reversed scored so that high scores on all relationship scales indicated higher

quality of relationships. The items for the parent, peer, school, and neighbourhood quality of relationship scales are presented in Appendix 1.

For each possible relationship scale, students were grouped into one of three categories of relationship quality (low, medium, and high) based on a tertile split for the whole sample. This analysis was repeated for each of the three data collection cycles (2002, 2006, and 2010). Trend analyses were then conducted to compare the proportion of students by grade in the high relationship category over the three cycles.

#### *Health Behaviour Scales*

There were 19 health behaviours identified for the 2002 and 2006 surveys and 24 health behaviours identified for the 2010 survey. Sixteen of those behaviours were common across all three surveys and were used in the analyses for this report. The 16 health behaviours were grouped into 6 categories or domains. Those 6 domains with the corresponding 16 health behaviours consist of:

1. Physical Health (injuries, overweight/obese, overall health)
2. Healthy Lifestyle (healthy eating, physical activity)
3. Emotional Health (quality of life, psychosomatic symptoms, mental health)
4. Aggression (bullying, victimization, fighting)
5. Substance Use (smoking, alcohol use, cannabis use, hard drug use)
6. Sexual Behaviours

Table 2 defines the measures for each of the 16 health behaviours common across the 2002, 2006 and 2010 HBSC surveys. For the analyses, the behaviours were dichotomized according to the nature of the response categories, which indicated either good or poor health behaviours. The scales are described in *The Health of Young People: A Mental Health Focus* (2011), <http://www.phac-aspc.gc.ca/hp-ps/dca-dea/prog-ini/school-scolaire/behaviour-comportements/publications/hcyp-sjc-eng.php>. Note that each of these measures comprised the **students' self reports** on their health behaviours and relationships.



Table 2: Defining Health Behaviour Measures

Behaviours	Base Behaviour	Comparison Behaviour
<b>Physical Health</b>		
Injuries	No injury requiring hospitalization in the last 12 months	Injury requiring hospitalization in the last 12 months
Overweight/obese (BMI was calculated from responses of weight and height)	Not overweight/ obese	Overweight/obese
Overall Health	Poor health	Good/Excellent health
<b>Healthy Life Style</b>		
Healthy Eating	Unhealthy eating	Healthy Eating
Physical Activity	Low physical activity	High physical activity
<b>Emotional Health</b>		
Quality of Life	Low quality	High quality
Psychosomatic Symptoms	No psychosomatic symptoms	Psychosomatic symptoms
Mental Health	Low mental health issues	Mental health issues
<b>Aggression</b>		
Bullying	No bullying	Bullying
Victimization	No victimization	Victimization
Fighting	No fighting	Fights
<b>Substance Use</b>		
Smoking	No smoking	Smoking
Drinking Alcohol	No drinking of alcohol	Drinks alcohol
Cannabis Use	No cannabis use	Cannabis use
Hard Drug Use	No hard drug use	Hard drug use
<b>Sexual Behaviour</b>		

Sexual Activity	No sexual activity	Sexual activity
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## Data analyses

To assess the connection between high quality relationships and student health behaviours, we conducted logistical regression analyses for each variable for each data collection cycle. In each logistic regression we examined the association between relationship variables as independent predictors and specific health behaviours as dependent variables, while stratifying by sex and grade. Coefficients from each model are used to produce prevalence estimates for the associations. To determine whether each relationship was associated with a health behaviour above and beyond the effects of the other relationships (i.e., the combined influence of the relationships), we entered the three other relationship scales as covariates. For example, to assess the link between quality of peer relationships and rates of injury, we covaried the parent, school, and neighbourhood relationships to control for these effects. Finally, for any significant trend result (i.e., any significant relationship that was present for each of the 2002, 2006, and 2010 data collection cycles), we then examined the average percent change (averaged over the three cycles for high quality relationships compared to low quality relationships) for that specific behaviour.

## Results

We first present the findings from the 2002, 2006 and 2010 HBSC data by showing trends in the percentages of students with high quality relationships with their parents, peers, school, and neighbourhood. Next, trend results are presented for the percentages of students experiencing each of 16 health behaviours based on the quality of their relationships with their parents, peers, schools, and neighbourhoods. The results are represented graphically, followed by a description of trends across all three survey cycles. In the trend analyses, we report on the average percentages of students across all three cycles on specific health behaviours, comparing those who have a high relationship quality to those who had a low quality relationship. For example, across the three cycles, we report the average percentage of those who had an injury among the students with a high quality of relationship with parents, compared to those with a low quality relationship. We have presented figures only for those results that were significant for all three cycles. At the end of the results section we provide a summary of the results across all three cycles of data collection (see Table 2). Results from analyses for each of the 2002, 2006, and 2010 cycles are presented in Appendix 3. It is important to note that with samples as large as those collected for the HBSC, a difference of 2% represents a significant difference.

## **Trends in High Quality Relationships in 2002, 2006, and 2010**

Figures 1 to 4 present trends in the percentage of students with high quality of relationships with parents, peers, school, and neighbourhood across the 2002, 2006, and 2010 HBSC survey cycles. The results are first presented with males and females on the same graph to illustrate gender differences<sup>1</sup>. The data are then presented on separate graphs for males and females, indicating trends over time for each grade. Consistent with our previous report on the 2010 data (Pepler et al., 2012), we found that across all relationships and in all cycles, the percentage of students reporting high quality relationships declines with increasing level of schooling (i.e., grade level).

### *Parent Relationships*

The proportions of students reporting a high quality relationship with their parents at each of the three time periods are shown in Figure 1.1, with data for males and females separated. There was a general trend over time, particularly among boys, for a lower proportion of students to report a high quality of relationship with their parents. As seen in Figure 1.1, more grade 8 males in 2002, 2006, and 2010 reported having a high quality relationship with their parents than females. In 2002, the proportion of males in all grades reporting a higher quality relationship with their parents was higher than that for females. In 2006, this gender difference was also present for all grades, except grade 6. In 2010, this gender difference was present in grades 6 and 8. At each assessment wave, a lower proportion of students reported high quality relationships with their parents for both males and females with increasing grades (see Figures 1.2 and 1.3 for males and females, respectively). Thus, there was a consistent trend over the three cycles: as grade increased, a lower proportion of students reported a high quality relationship with their parents. Over time, the gender difference in the proportion of males and females reporting a high quality relationship with their parents diminished.

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<sup>1</sup> Throughout the report we use the term gender differences, as opposed to sex differences, because most of the health behaviours are a function not only of biology, but also of social experiences.

Figure 1.1: Percentage of students reporting high quality relationship with parents

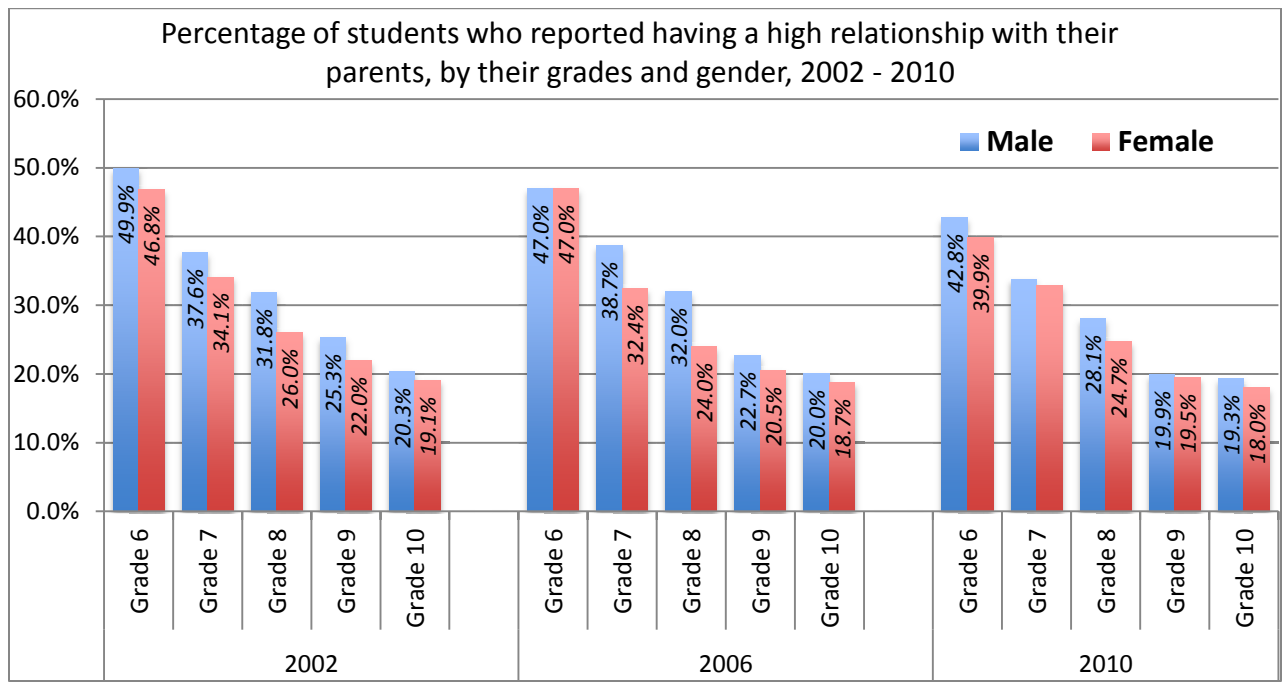


Figure 1.2: Percentage of students reporting high quality relationships with parents, by grade (Males only)

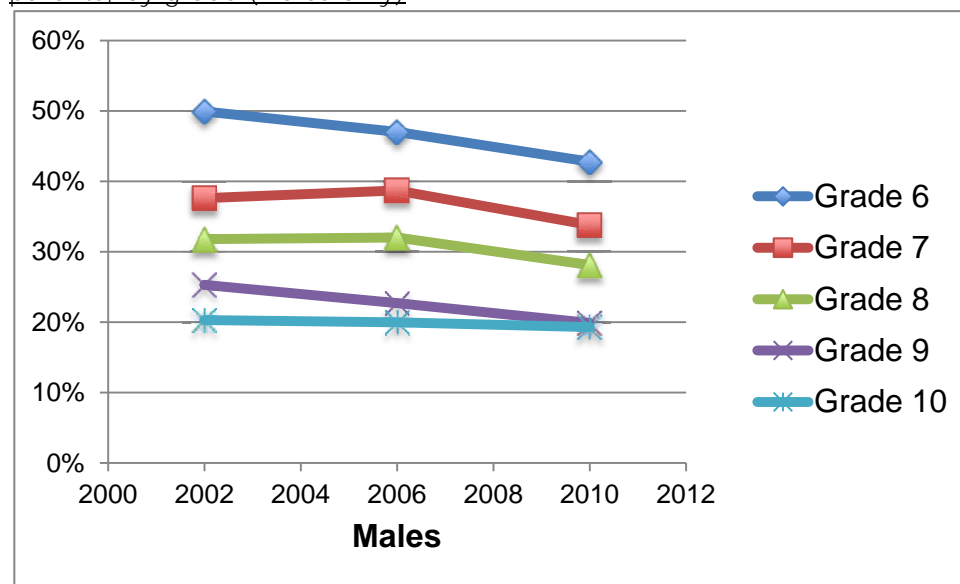
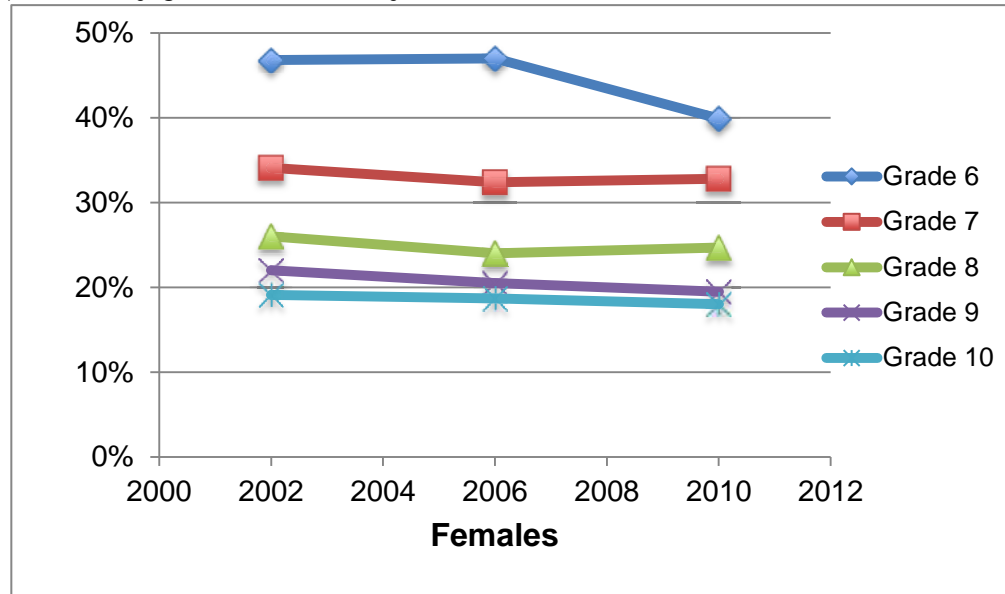


Figure 1.3: Percentage of students reporting high quality relationships with parents, by grade (female only)



#### *Peer Relationships*

The proportions of students reporting a high quality relationship with their peers at each of the three time periods are shown in Figure 2.1, with data for males and females separated. There was a **general dip in the proportion of students' reporting of high quality relationships with peers in 2006**, relative to 2002. The proportions of student reporting high quality peer relationships in 2010 were generally similar to that in 2002. As illustrated in Figure 2.1, the proportion of females in all grades in 2002 who reported high quality peer relationships was higher than that for males. The pattern of results was not evident in 2006 or in the older grades in 2010. Across all cycles, the proportion of students reporting a high quality relationship with their peers declined with increasing grade (see Figures 2.2 and 2.3 for males and females, respectively). Thus, there was a consistent trend over the three cycles: as grade increased, there was a lower proportion of students reporting a high quality relationship with peers. In contrast, there were inconsistent findings across years in the gender differences, with fewer differences in 2010 compared to 2002.

Figure 2.1: Percentage of students reporting high quality relationships with peers

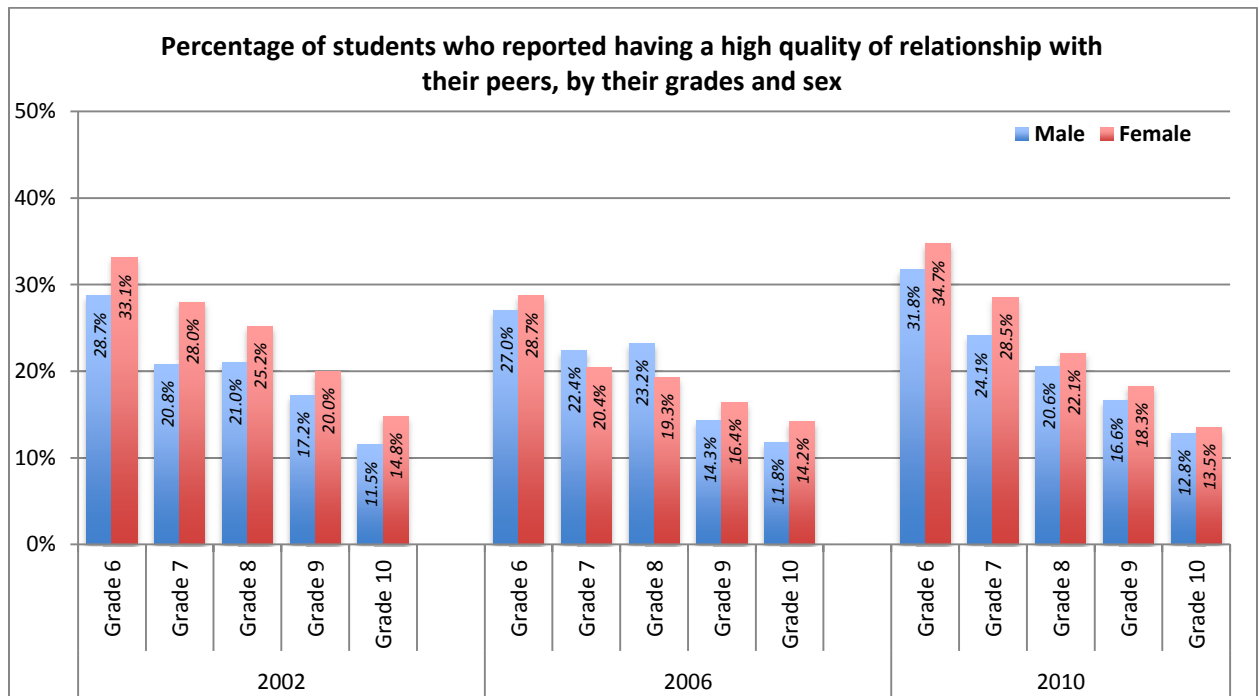


Figure 2.2: Percentage of students reporting high quality relationships with peers, by grade (Males only)

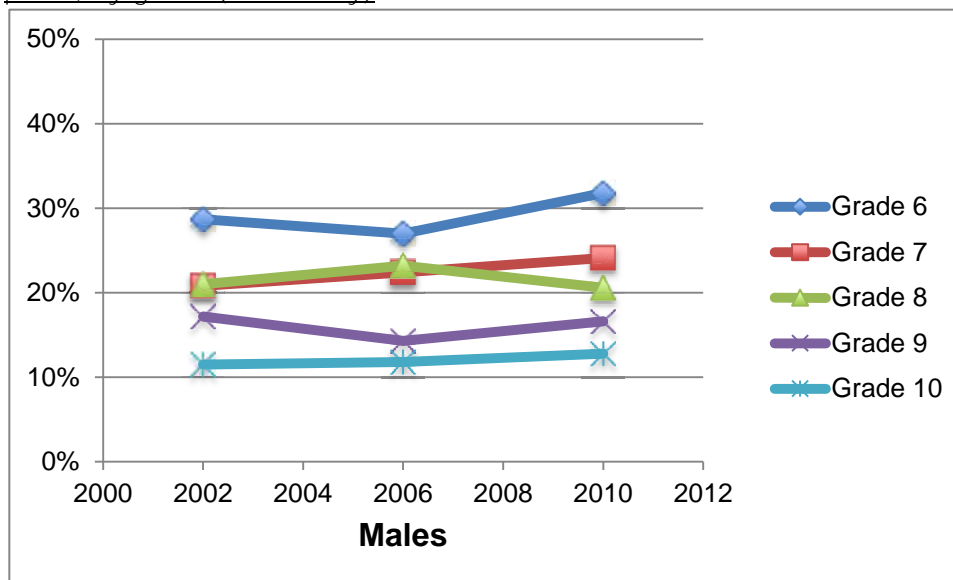
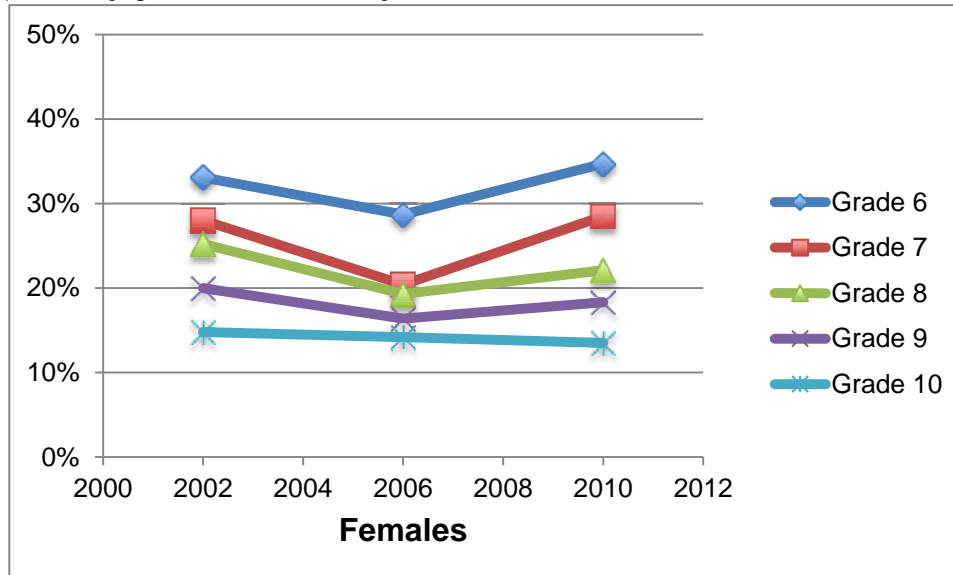


Figure 2.3: Percentage of students reporting high quality relationships with peers, by grade (Females only)



#### *School Relationships*

The proportions of students reporting a high quality relationship with their schools at each of the three time periods are shown in Figure 3.1, with data for males and females separated. There was a marked decrease in the proportions of students who reported a high quality of relationship from 2002 to 2006 and this drop was evident across all grades, from grade 6 to grade 10. Relative to the very low proportions in 2006, there was a recovery in the proportions of students who reported high quality relationships with schools; however, these rates were significantly lower than in 2002, with the exception of the youngest students: a similar proportion of Grade 6 students in 2002 and 2010 reported high quality relationships with school. For the relationship with school, there was a consistent overall gender difference (see Figure 3.1). In all cycles, a greater proportion of females in grades 6 and 7 reported a high quality relationship with school than males. In the 2002 cycle, this gender difference was present in grades 8 and 10, but not in grade 9. In 2006, this gender difference was present in grade 8, but not in grades 9 and 10. In 2010, the gender difference was not present in grades 8, 9, and 10. Thus, there is not a consistent pattern in gender differences over the three cycles; in 2010, there were the fewest grades with gender differences in the quality of relationships with school. Across all cycles, there was a decline from grade 6 to grade 10 in the proportion of students reporting a high quality relationship with schools (see Figures 3.2 and 3.3 for males and females, respectively).

Figure 3.1: Percentage of students reporting high quality relationships with schools

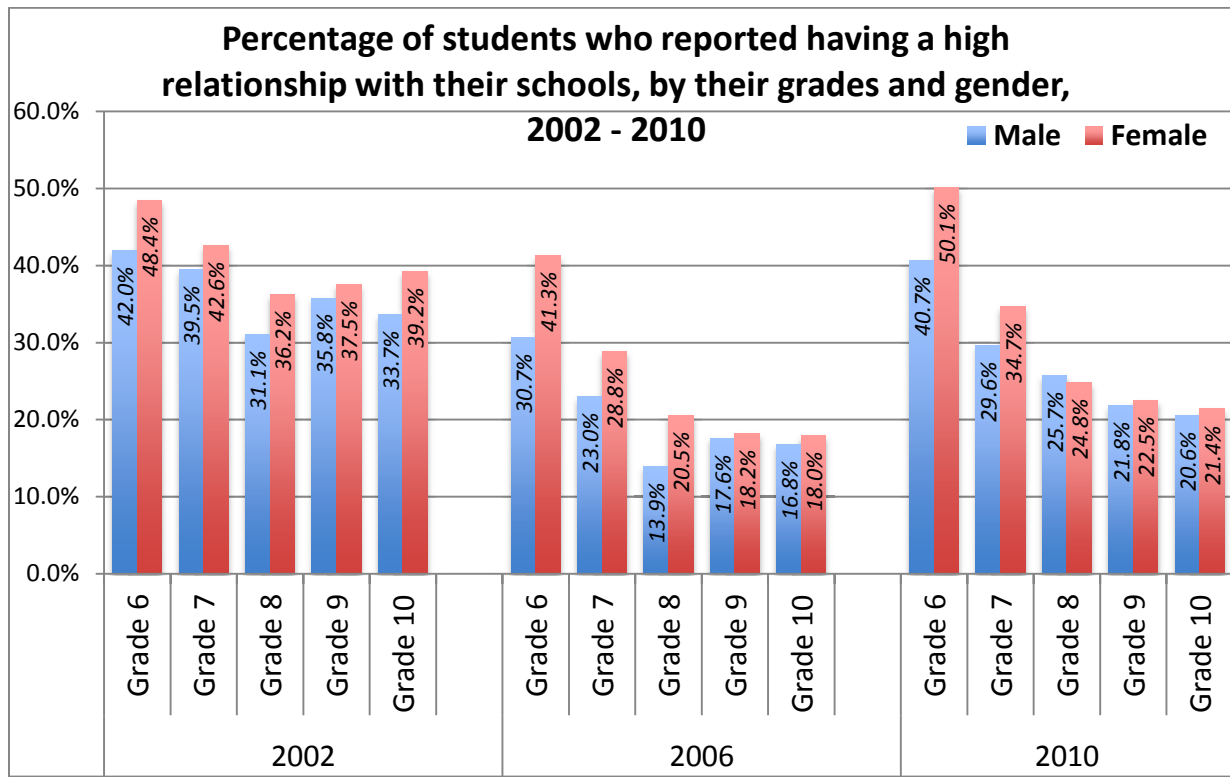


Figure 3.2: Percentage of students reporting high quality relationships with schools, by grade (Males only)

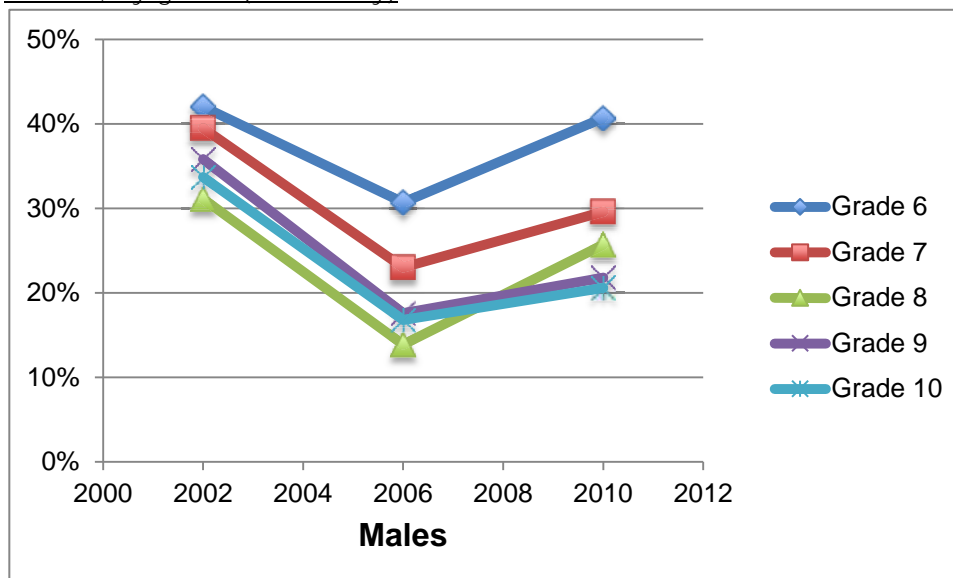
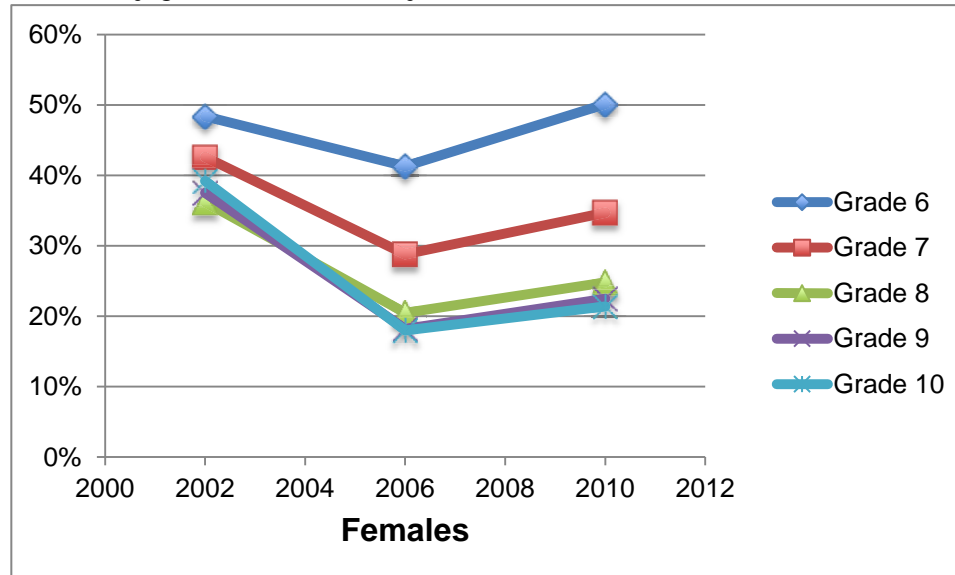




Figure 3.3: Percentage of students reporting high quality relationships with schools, by grade (Females only)



#### *Neighbourhood Relationships*

The proportions of students reporting a high quality relationship with their neighbourhood at each of the three time periods are shown in Figure 4.1, with data for males and females separated. Compared to the 2002 and 2006 cycles, a smaller proportion of students in the 2010 cycle reported high quality relationships with their neighbourhoods. There was a consistent gender difference in the quality of neighbourhood relationships. Across all cycles, the proportions of females reporting a high quality relationship with their neighbourhood were greater than that of males. The gender difference varied somewhat across grades within cycles. In 2002, a higher proportion of females than males reported high quality neighbourhood relationships in grades 7, 8 and 10 students, but not in grades 6 or 9. In 2006 and 2010, there were no gender differences in grades 6, 7, 8, and 9, only in grade 10. Thus, the gender differences in the proportion of students reporting a high quality of relationship with their neighbourhood tended to decrease from 2002 to 2006 and 2010. Across all cycles, there was a significant decline from grade 6 to grade 10 in the proportion of students reporting a high quality relationship with their neighbourhoods (see Figures 4.2 and 4.3 for males and females, respectively). This difference was evident across all grades and both genders.

Figure 4.1: Percentage of students reporting high quality relationships with their neighbourhoods

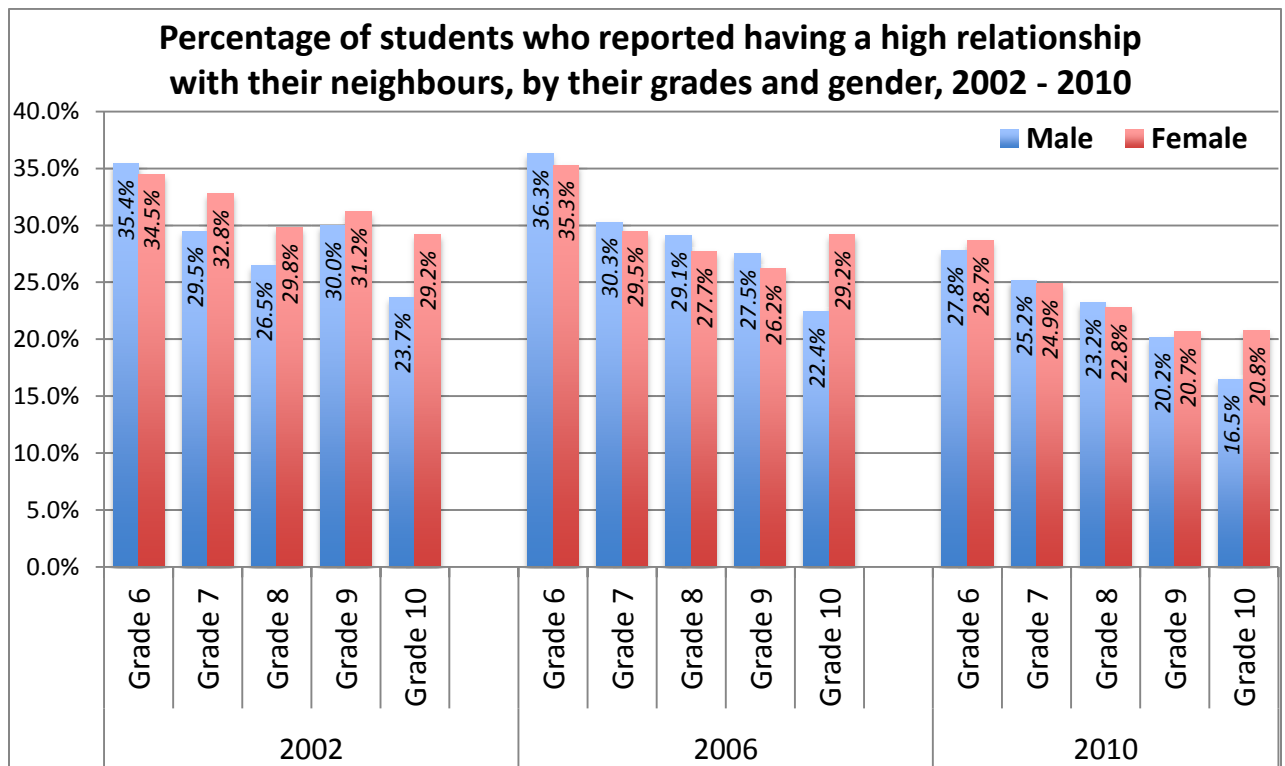


Figure 4.2: Percentage of students reporting high quality relationships with neighbourhoods, by grade (Males only)

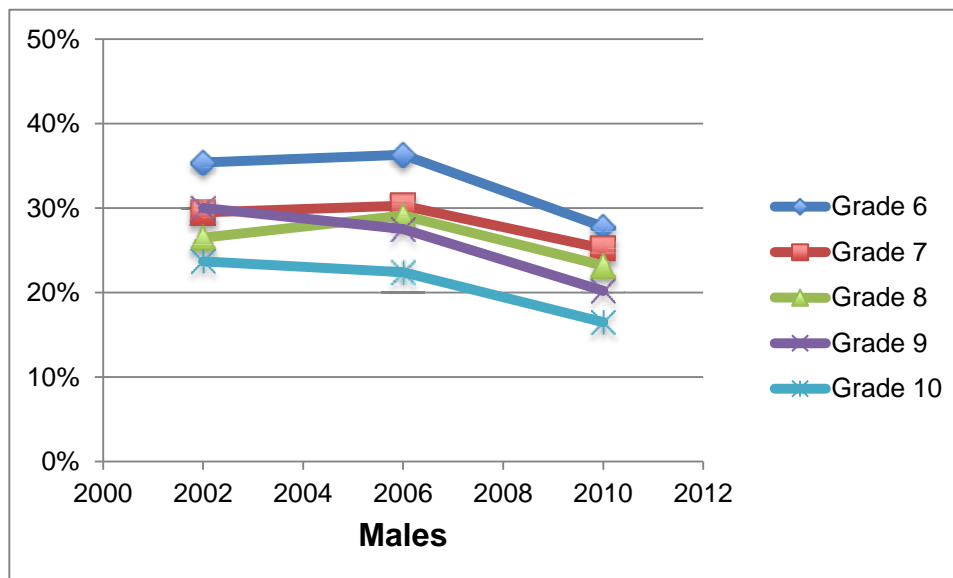
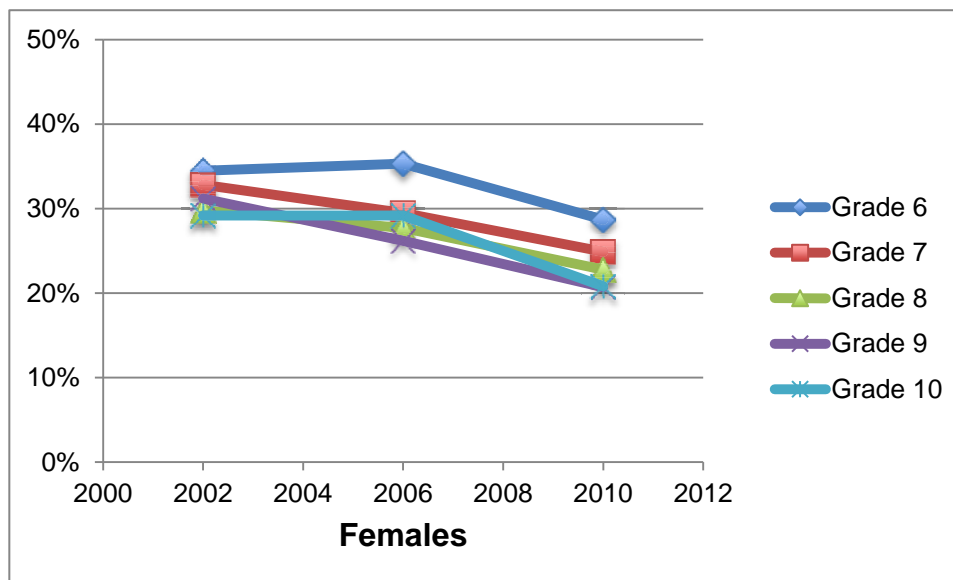


Figure 4.3: Percentage of students reporting high quality relationships with neighbourhoods by grade (Females only)



#### *Summary of Relationship Trends*

A review of these relationship patterns reveals some interesting trends within and across the different relationships. For reports of relationships with parents, there was a general decrease in the proportion of youths who reported a high quality relationship with parents. The exceptions to this decreasing trend were found for females in grade 8 and females and males in grade 10, where a consistent proportion of students reported high quality relationships.

For reports of relationships with peers, the proportion of students reporting a high quality relationship was generally consistent over the three cycles. The exceptions to this trend were for a greater proportion of males in grades 6 and 7 reporting high quality relationships in the 2010 cycle. Conversely, a lower proportion of females in grade 8 reported a high quality peer relationship in 2006 and 2010, compared to 2002.

For reports of relationships with schools, there was generally a decrease in the proportion of students reporting a high quality relationship over the three cycles. This decrease was found for both males and females in all grades. The exception to this trend was found in grade 6, where the proportions were relatively similar in 2002 and 2010; however, there was a dip in the proportions of high quality relationships in for both males and females in grade six in 2006.

Finally, for reports of relationships within neighbourhoods, there was a consistent decrease in the proportion of students who reported a high quality of relationships within their neighbourhoods. The decrease was found for both males and females across all grades.

## **Trends in Physical Health and Links with Relationship Quality**

Figures 5 to 34 present trends in the percentage of students experiencing 16 identified health behaviours based on the quality of their relationships with their parents, peers, schools, and neighbourhoods over the 2002, 2006, and 2010 HBSC survey cycles. These results are separated by sex. We have only included figures of the relationships for which the association between the quality of relationships and the health behaviour was significant over all three years, so trend data can be discussed.

### *Trends in Injuries*

Injuries were the leading cause of death for children 10-14 years old in Canada in 2010 and the second leading cause of death in older teens (Freeman et al., in press). Injuries in adolescence have continued to increase over the last decade. Injuries are costly to society in terms of health care expenditures and time lost from productive activities for both adolescents and the adults who care for them when they are injured. **In this section we look at the association of students' reports of injuries with the quality of their relationships.** In the HBSC survey, students were asked questions regarding any injuries that they had sustained in the last year, which required hospitalization. One year represents the standard time period over which it is believed that young people can recall their injury experiences accurately.

Overall, males were more likely to report a physical injury requiring hospitalization than females and no clear trends were observed across time. Only one relationship, that with parents, was consistently linked to the likelihood of injuries across all three cycles. A higher quality relationship with parents was associated with fewer reports of injuries. Across the three cycles, males with a high quality relationship with their parents were on average 15.7% less likely to sustain a physical injury than those with a low quality parent relationship (see Figure 5.1). Among females, this pattern was slightly more pronounced: those with a high quality parent relationship were on average 22% less likely to sustain an injury requiring hospitalization than those with a low quality parental relationship (see Figure 5.2). Interestingly, having a high quality parent relationship was related to fewer injuries for both genders, whereas having a high quality peer relationship was related to more injuries in 2002 and 2010. The quality of school relationships was not associated with injuries requiring hospitalization in any cycle. **The quality of adolescents' neighbourhood relationships was related to the likelihood of injuries in 2006 and 2010, but not 2002.** Thus, over time the protective role of neighbourhood relationships appears to have increased.

Figure 5.1: Percentage of Students Injured in the Past 12 Months, by Parent Relationships (Males Only) HBSC 2002, 2006, and 2010

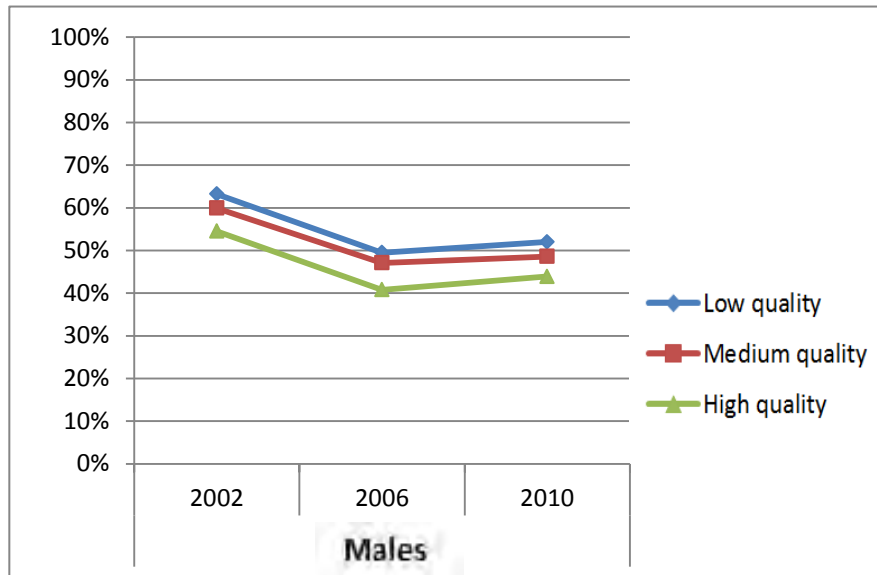
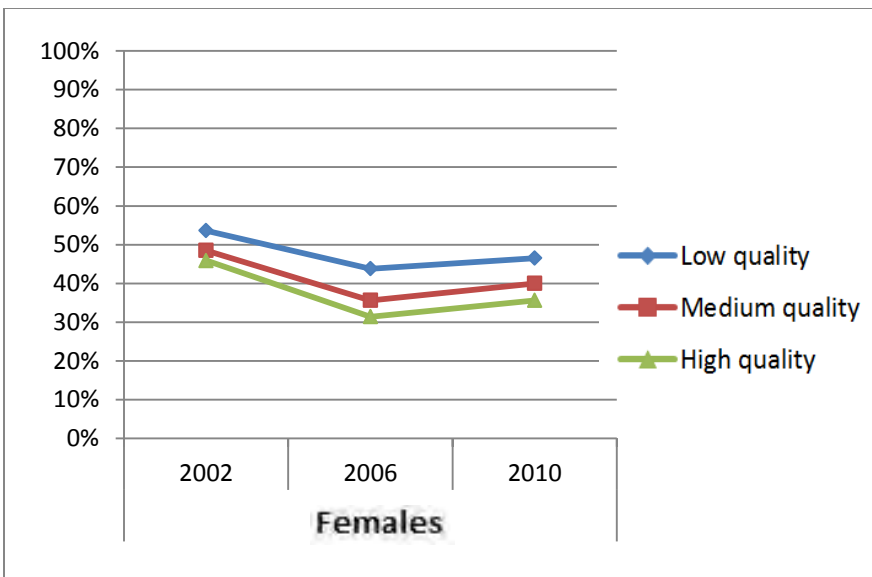


Figure 5.2: Percentage of Students Injured in the Past 12 Months, by Parent Relationships (Females only) HBSC 2002, 2006, and 2010



### *Trends in Overall Health*

Overall Health is a measure of general well-being. Health was assessed using a validated Likert-type self-rated health measure (Currie et al., 2001) where students responded to, “Would you say your health is ...?” Responses ranged from excellent, good, fair, to poor, with excellent health associated with a high score and poor health associated with a low score. Research generally indicates that those individuals who report better physical health are also more likely to report better mental health (Freeman et al., 2011).

Generally, males were more likely to report good or excellent health than females, with no clear changes across cycles. The associations between the overall health of students and the quality of their relationships were somewhat inconsistent. The quality of parent relationships was associated with positive overall health only in 2010 cycle. This suggests that the quality of parent relationship may become more important with respect to overall health over time. The quality of peer relationships was significantly associated with overall health across all three cycles. Males with high quality peer relationships were on average 4% more likely to report good or excellent health (see Figure 6.1). This link was more pronounced among females, who were 6.7% more likely to report good or excellent health if they had positive peer relationships (see Figure 6.2). The quality of **students’ relationships with school was not associated with overall health in any cycle. In contrast,** the quality of neighbourhood relationships was significantly and consistently associated with overall health. A high quality relationship within the neighbourhood was associated with a 3.1% increase and a 10.7% increase in the proportions of youth reporting good or excellent overall health among males and females, respectively (see Figures 7.1 and 7.2).

Figure 6.1: Percentage of Students Reporting Good or Excellent Health, by Peer Relationship (Males Only) HBSC 2002, 2006, and 2010

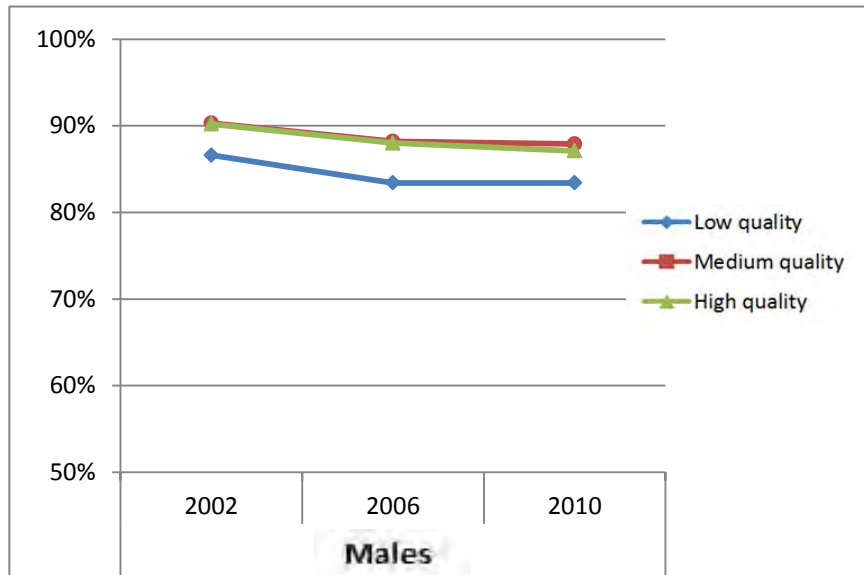


Figure 6.2: Percentage of Students Reporting Good or Excellent Health, by Peer Relationship (Females only) HBSC 2002, 2006, and 2010

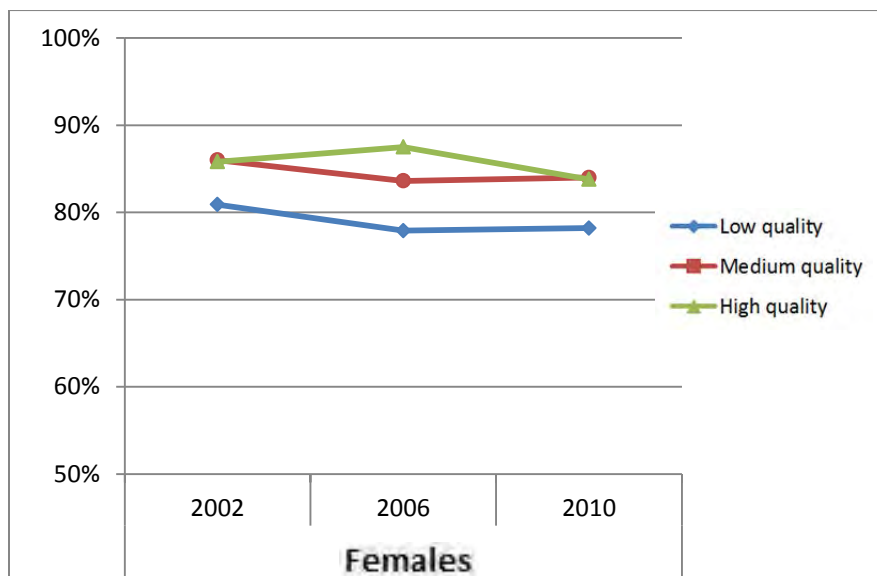


Figure 7.1: Percentage of Students Reporting Good or Excellent Health, by Neighbourhood Relationship (Males Only) HBSC 2002, 2006, and 2010

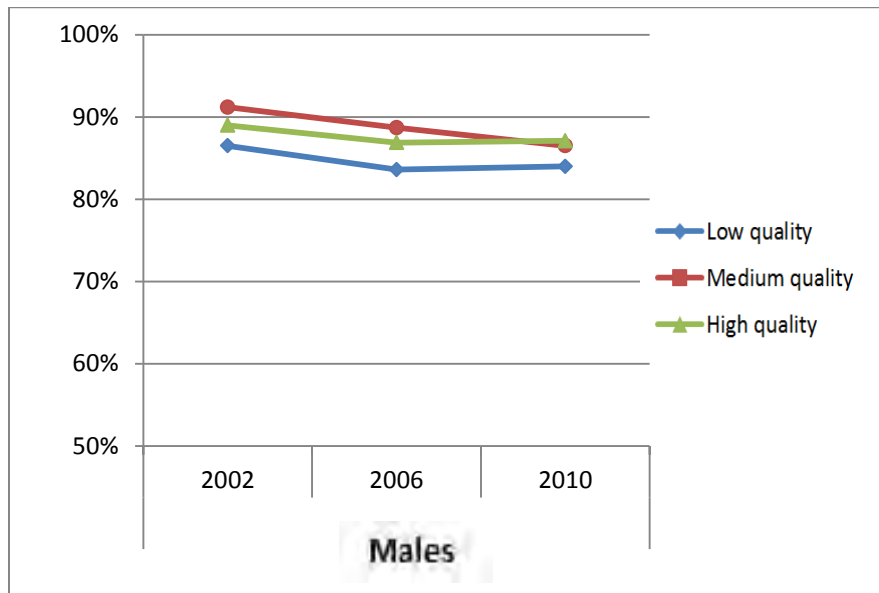
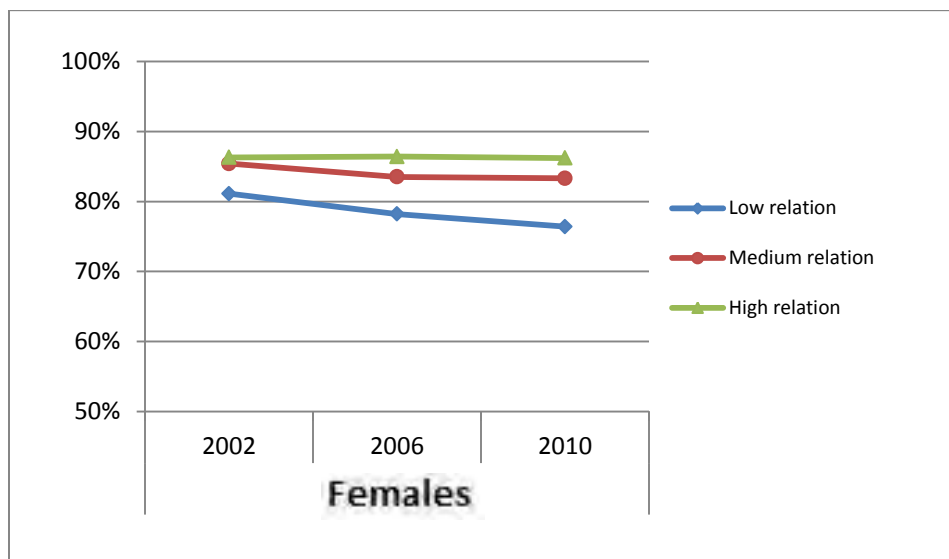


Figure 7.2: Percentage of Students Reporting Good or Excellent Health, by Neighbourhood Relationship (Females only) HBSC 2002, 2006, and 2010





### *Trends in Overweight/Obesity*

Obesity is a more severe form of excess weight and fat than being overweight. Being overweight or obese arises from a long-term imbalance, in which the number calories (energy) consumed in the diet exceeds the amount of energy that the body expends in physical activity. Over time, limited levels of physical activity, too much time spent in sedentary behaviours such as watching television and surfing the web, and/or overconsumption of foods, particularly those that are high in sugars and fats, can lead to excessive weight and obesity (World Health Organization, 1998). Students reported their height and weight. These values were used to calculate their body mass index (BMI). BMI is calculated as an individual's body weight divided by the square of the individual's height. The standard international unit is  $\text{kg/m}^2$ . International age- and sex-specific BMI standards for children and youth were used to classify the students as being a healthy weight, overweight, or obese. A high Body Mass Index (BMI) has become a marker for increased risk of health problems, such as diabetes, heart disease, high blood pressure, and other problems. In this section we look at the **association of a BMI of overweight or obese with the quality of the students' relationships.**

Across the three cycles, there was no consistent relationship between body mass index and the **quality of students' relationships with their parent, peers, school, and neighbourhood.** The quality of parent relationships was not significantly associated with BMI within any of the cycles. The quality of peer relationships was positively related to BMI in 2002 and 2010, but not 2006. The quality of school relationships was positively related to BMI in 2002 only. The quality of neighbourhood relationships was positively associated with BMI only in 2006. Thus, the role of relationship in BMI has fluctuated over the three cycles and there is no clear pattern. These relationships also are different by gender depending on the year. For example, in 2010, the quality of all relationships was more strongly related to the risk of being overweight or obese for males than females. However in 2006, the quality of relationships with parents and peers was more likely to be associated with males being overweight or obese than females. But in 2002, it was only the quality of relationship with parents that was more likely to be associated with males being overweight or obese than females.

### *Trends in Healthy Eating*

Healthy eating has been shown to improve the ability to maintain a healthy body weight, obtain nutrients that the body needs to function, and reduce the risk of many chronic diseases. Food choices and eating behaviours can also impact mental health, although the causal direction of these relationships is not always clear. For instance, eating unhealthy foods may contribute to the development of mental health issues, and mental health issues may also impact the food choices and eating behaviours a young person makes. In the HBSC survey, students were asked questions about how frequently they consumed a number of foods and beverages. For each food or beverage, response options ranged from as low as 'never' to as high as 'more than once per day'. Within the HBSC study, young people who consumed a given food or beverage once per day or more often were considered to be high consumers. Below we **discuss how the quality of students' relationships** is related to healthy eating.

There were inconsistent patterns across cycles and relationships in the links to healthy eating. The quality of the parent relationship was associated with healthy eating in 2006 and 2010, but not 2002. This suggests that the role of parents in students' healthy eating may become more important over time. The quality of peer and school relationship was positively associated with healthy eating in 2010 only. This suggests that the quality of students' relationships with peers and school may have become an important protective factor in recent years. In contrast, the quality of students' relationships within their neighbourhood was associated with healthy eating consistently across all three cycles, such that as the quality of neighbourhood relationship increased, so did healthy eating. Positive neighbourhood relationships corresponded to an increase in the proportion of youth reporting healthy eating of 8.5% among males and 9.4% among females (see Figures 8.1 and 8.2, respectively). Healthy eating behaviour did not vary significantly across gender or cycle.

Figure 8.1: Percentage of Students Reporting Healthy Eating, by Neighbourhood Relationship (Males Only) HBSC 2002, 2006, and 2010

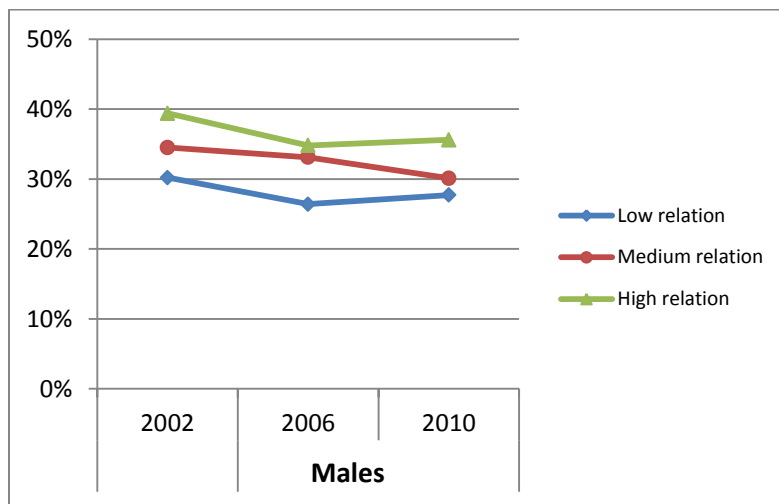
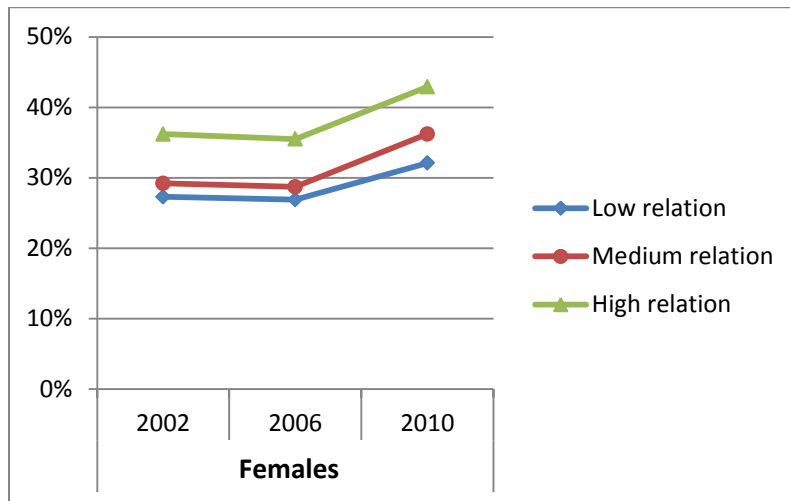


Figure 8.2: Percentage of Students Reporting Healthy Eating, by Neighbourhood Relationship (Females only) HBSC 2002, 2006, and 2010



#### *Trends in Physical Activity*

People who are physically active live longer and have a higher quality of life (Janessen & LeBlanc, 2010). Physical activity can also help boost self-esteem and generally improve students' academic experiences (Camero, Hobbs, Stringer, Branscum, & Taylor, 2012). Students in the HBSC survey were asked questions related to how many days in a typical week they were physically active at a moderate-to-vigorous intensity for at least 60 minutes. Young people who reported 60 minutes or more of physical activity seven days of the week were considered to be physically active, while those participating in lesser amounts were considered to be physically inactive (Janssen & LeBlanc, 2010). Students also reported the number of hours in a typical week in which they exercised or were physically active during class time at school, during free time at school, and during free time outside of school hours. Below are the associations of quality of relationships and physical activity.

Generally males were more likely to be physically active than females, with no clear changes across the three cycles. There were inconsistent patterns across the cycles in the links between the quality of relationships and physical activity. The quality of parent relationships was linked to students' reports of being highly physically active only in 2010. In contrast, the quality of peer relationships was consistently related to physical activity across all three cycles, such that high quality peer relationships were linked to higher levels of physical activity. High quality peer relationships corresponded to an increase in the proportion of youths reporting high physical activity of 6.9% among males and 6.7% among females (see Figures 9.1 and 9.2, respectively). The quality of school relationships was related to increased physical activity only in 2002. Similar to peer relationships, the quality of students' relationships within their neighbourhood was linked to physical activity in all three cycles. A high quality neighbourhood relationship corresponded to an increase in the

proportion of students reporting high physical activity of 12.2% for males and 11.3% in females (see Figures 10.1 and 10.2, respectively).

Figure 9.1: Percentage of Students Reporting Physical Activity, by Peer Relationship (Males Only) HBSC 2002, 2006, and 2010

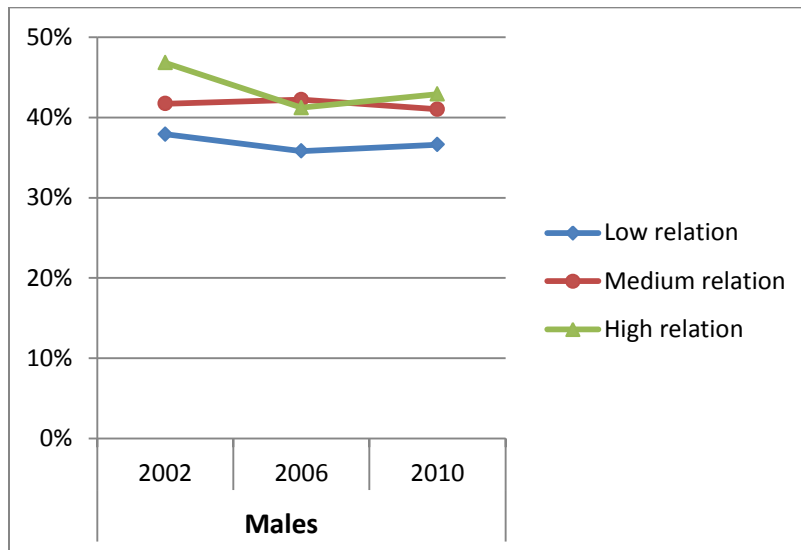


Figure 9.2: Percentage of Students Reporting Physical Activity, by Peer Relationship (Females only) HBSC 2002, 2006, and 2010

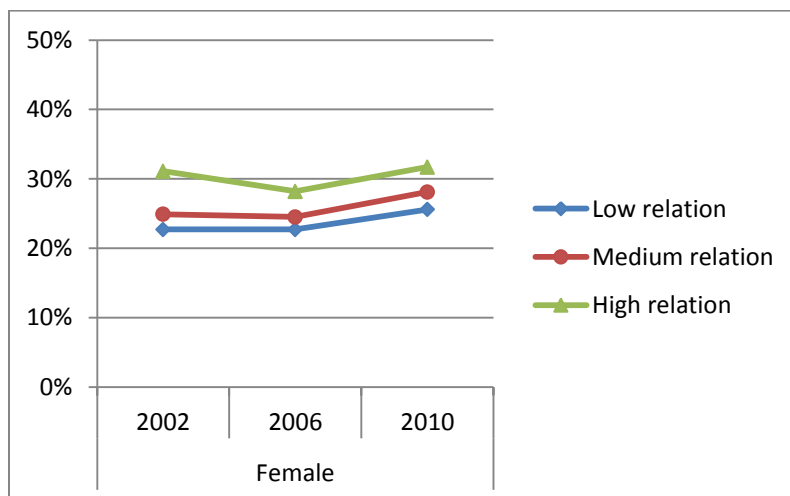


Figure 10.1: Percentage of Students Reporting Physical Activity, by Neighbourhood Relationship (Males Only) HBSC 2002, 2006, and 2010

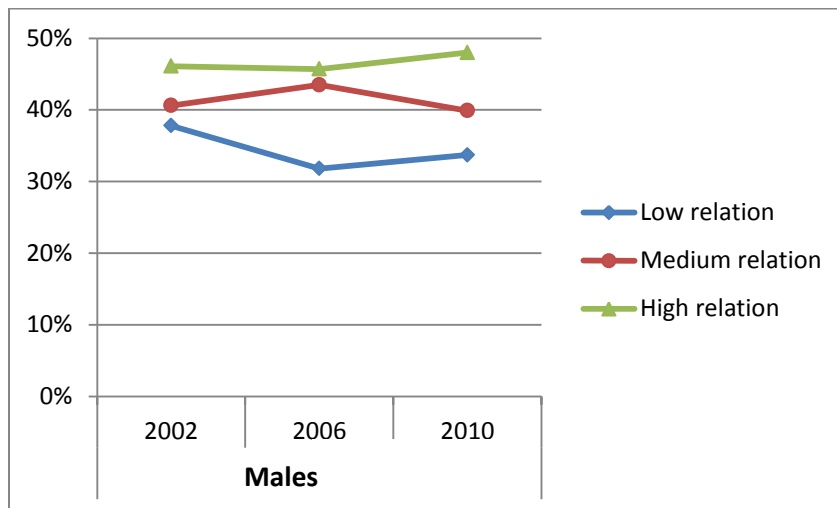
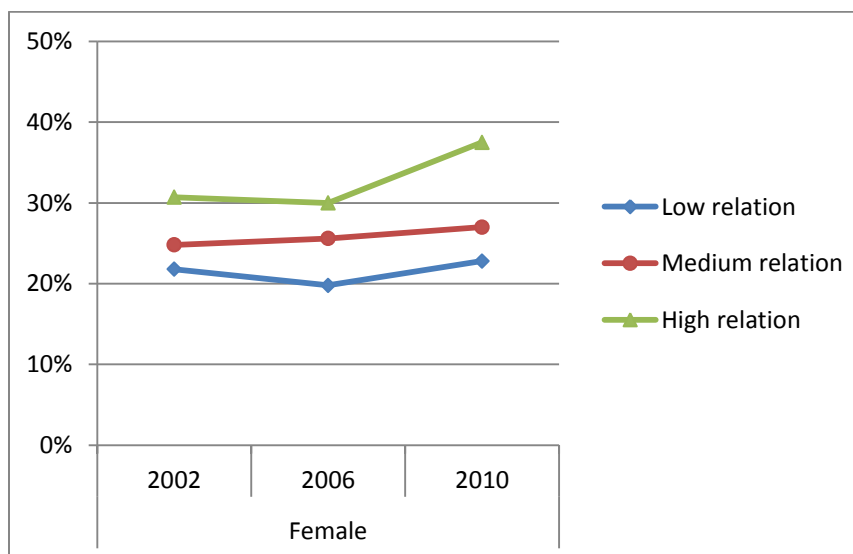


Figure 10.2: Percentage of Students Reporting Physical Activity, by Neighbourhood Relationship (Females only) HBSC 2002, 2006, and 2010



## Trends in Emotional Health and Links with Relationship Quality

### *Trends in Quality of Life*

The assessment of an individual's quality of life or life satisfaction is linked to overall well-being and health (WHO report, 2012). On the recent UNICEF report (2013), Canada ranked 24<sup>th</sup> of 29 rich countries on students' reports of life satisfaction. A concern was raised by UNICEF Canada (2013) about the discrepancy between UNICEF's assessment of general well-being for Canadian children and youth, which was ranked 17<sup>th</sup> and the low ranking for youths' own assessments of their life

satisfaction. The quality of life that youths experience is to a large extent dependent on their experiences and relationships at home, at school and in the community. On the survey, life satisfaction was assessed by asking students to rate their overall life satisfaction on a scale of 0 to 10, with '0' representing 'the worst possible life for me', and '10' representing 'the best possible life for me'. A score of 6 or more on this scale was identified as high life satisfaction. In the following section, we focus on the links between students' self-reported life satisfaction and the quality of their relationships with parents, peers, school and neighbourhood.

Overall, males were more likely to report a higher quality of life than females, and a greater proportion of students tended to report a higher quality of life in 2002 compared to other survey cycles. In all survey cycles, having positive relationships with parents, peers, schools, and the neighbourhood **were associated with youths' reports of a higher quality of life. This was one of three** behaviours for which the trends for all relationships were positively associated with health behaviour (i.e., quality of life, mental health and alcohol consumption). Among males, having a positive relationship with parents led to a 21.9% increase in the proportion reporting high quality of life (see Figure 11.1). This trend was more dramatic among females, with an average increase of 27.1% among those with high quality parental relationships (see Figure 11.2). This interaction with gender was not observed among peer relationships, with males and females both exhibiting an average increase in prevalence rates of 7.7% as a result of positive peer relationships (see Figures 12.1 and 12.2 for males and females, respectively). High quality relationships with school corresponded to an increase of 4.7% in the proportion of males and 5.9% of females reporting a high quality of life (see Figures 13.1 and 13.2 for males and females, respectively). High quality relationship with the neighbourhood resulted in increases in prevalence rates of 7.1% for males and 7% for females (see Figures 14.1 and 14.2 for males and females, respectively).

Figure 11.1: Percentage of Students High Quality of Life, by Parent Relationship (Males Only) HBSC 2002, 2006, and 2010

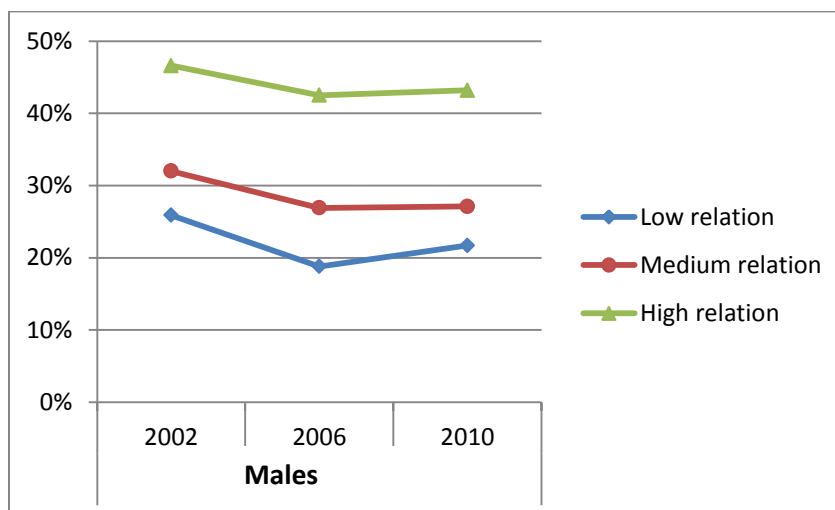


Figure 11.2: Percentage of Students High Quality of Life, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

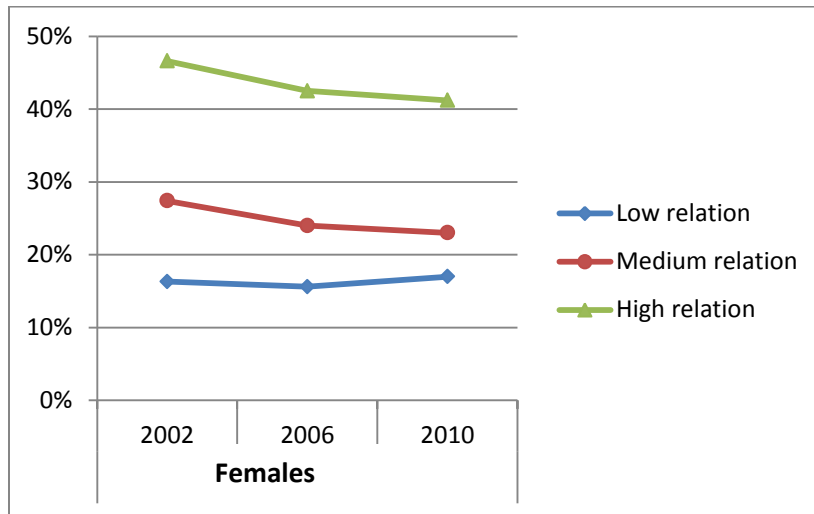


Figure 12.1: Percentage of Students High Quality of Life, by Peer Relationship (Males Only) HBSC 2002, 2006, and 2010

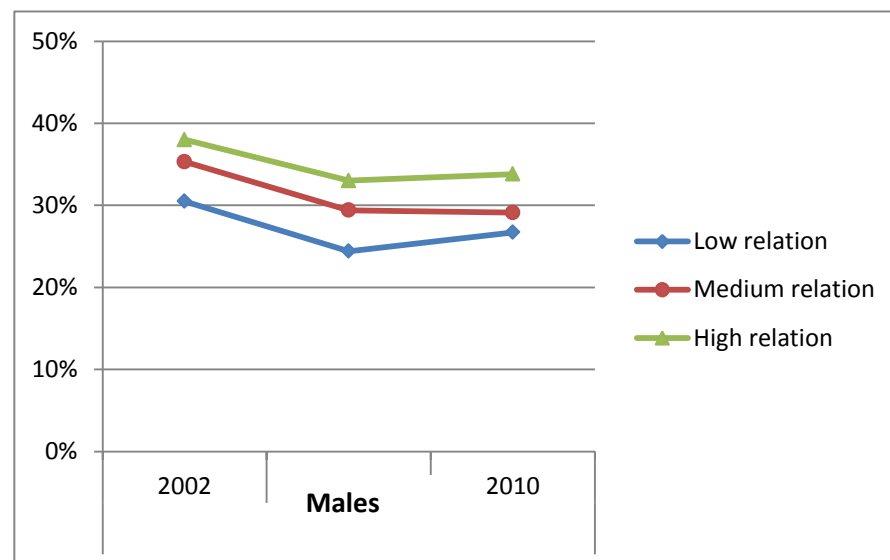


Figure 12.2: Percentage of Students High Quality of Life, by Peer Relationship  
(Females only) HBSC 2002, 2006, and 2010

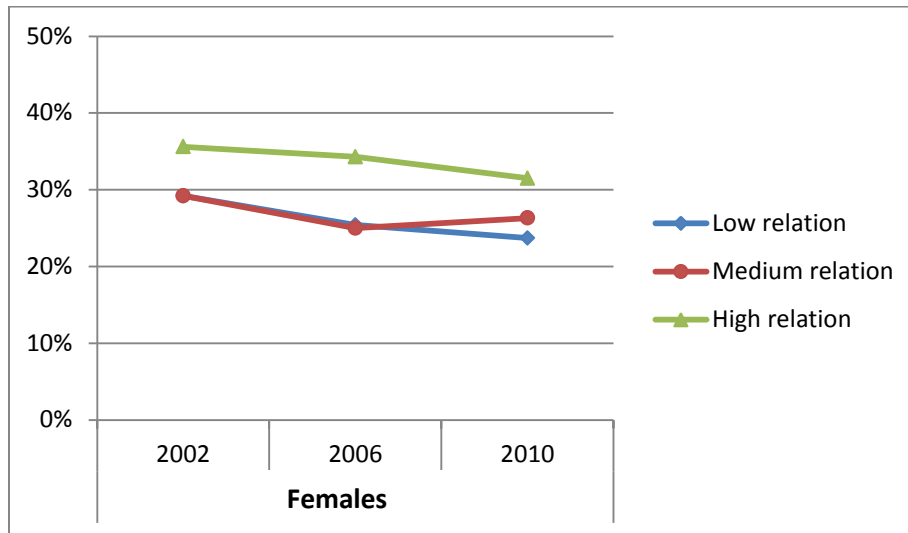


Figure 13.1: Percentage of Students High Quality of Life, by School Relationship  
(Males Only) HBSC 2002, 2006, and 2010

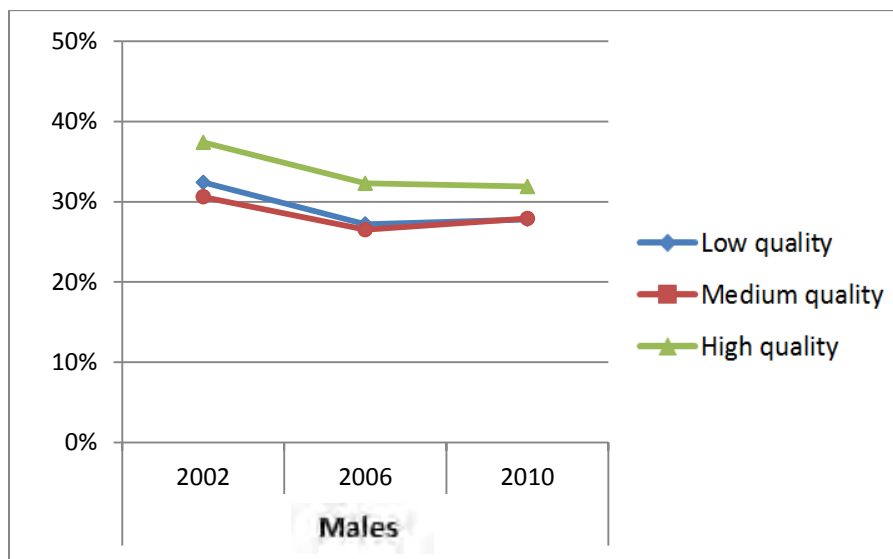




Figure 13.2: Percentage of Students High Quality of Life, by School Relationship (Females Only) HBSC 2002, 2006, and 2010

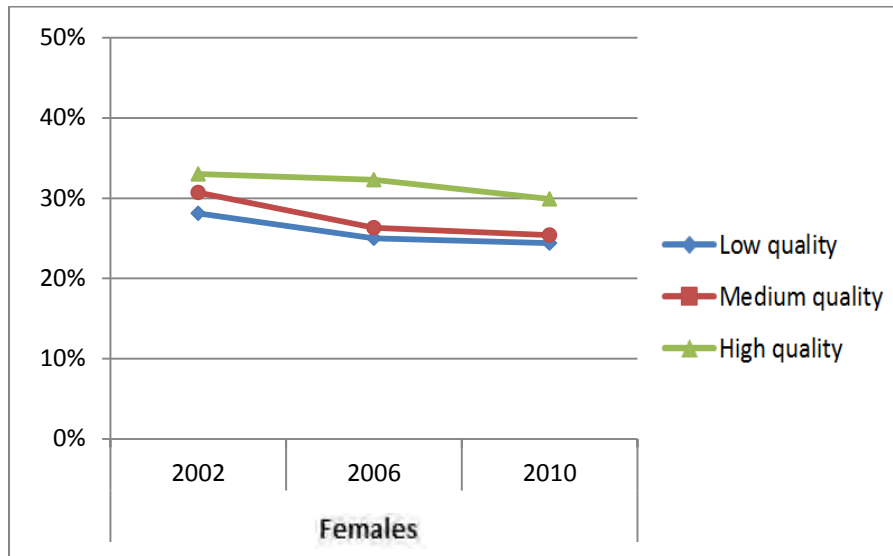


Figure 14.1: Percentage of Students High Quality of Life, by Neighbourhood Relationship (Males Only) HBSC 2002, 2006, and 2010

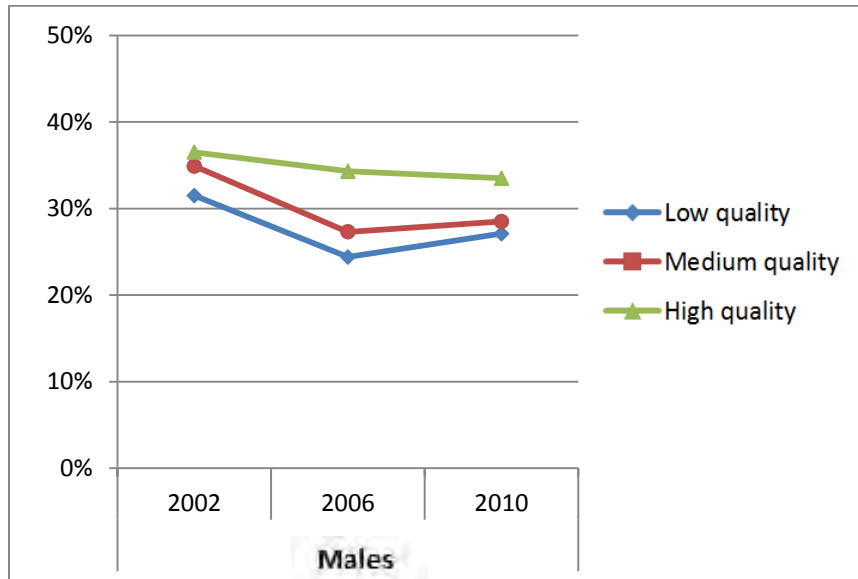
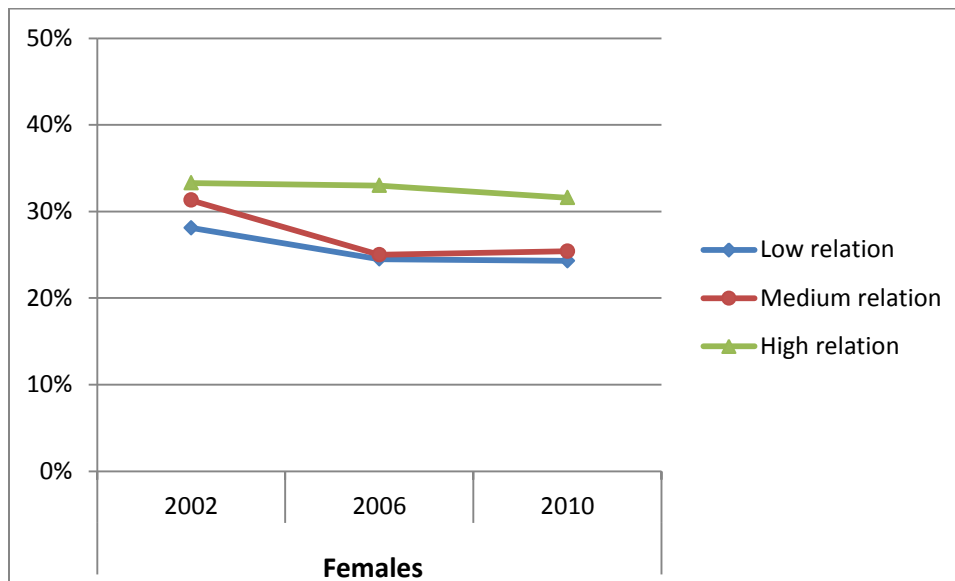


Figure 14.2: Percentage of Students High Quality of Life, by Neighbourhood Relationship (Females only) HBSC 2002, 2006, and 2010



#### *Trends in Psychosomatic Symptoms*

Psychosomatic problems, such as frequent headaches and stomach aches, can arise from exposure to stress in the physical and relationship environments in which children and youth grow up. Children who live in stressful family, peer, or other relationship contexts develop dysregulated stress responses through which they can become either hyper-vigilant or under-reactive to stress. Over a prolonged period of time, these dysregulated stress responses may be associated with changes in the brain (Repetti et al., 2002). In the following section, we examine trends in the links **between the quality of relationships and students' reports of psychosomatic symptoms.**

Overall, males tended to report fewer psychosomatic symptoms (e.g., headaches) than females, and participants tended to report fewer psychosomatic symptoms in 2002 than in subsequent survey cycles. The quality of both parent and peer relationships were consistently associated with psychosomatic symptoms across the three cycles: students with positive relationships with parents and peers reported fewer psychosomatic symptoms. Interestingly, high quality relationships with parents and peers showed the same pattern: both parent and peer relationships were associated with an lower average prevalence in psychosomatic symptoms of 16.4% for males and 15.6% for females. The data for parent relationships are illustrated in Figures 15.1 and 15.2 for males and females, respectively; the data for peer relationships are illustrated in Figures 16.1 and 16.2 for males and females, respectively. High quality school relationships were related to reports of fewer psychosomatic symptoms in 2002 and 2010, but not 2006 (see Figures 17.1 and 17.2 for males and females, respectively). Finally, the quality of relationships within the neighbourhood was associated with fewer psychosomatic symptoms in 2010 only (see Figures 18.1 and 18.2).

Figure 15.1: Percentage of Students with Psychosomatic Symptoms, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

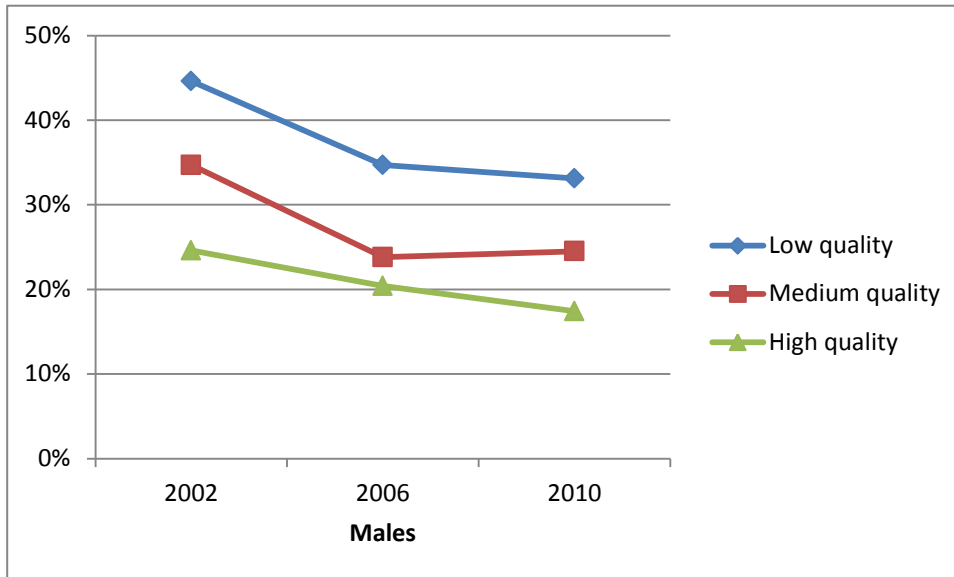


Figure 15.2: Percentage of Students with Psychosomatic Symptoms, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

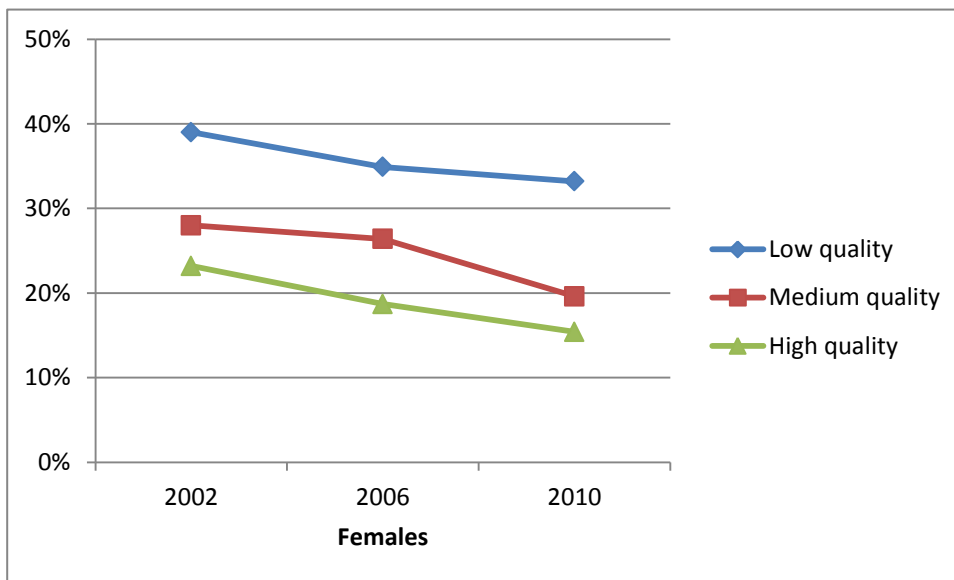


Figure 16.1: Percentage of Students Psychosomatic Symptoms, by Peer Relationship (Males only) HBSC 2002, 2006, and 2010

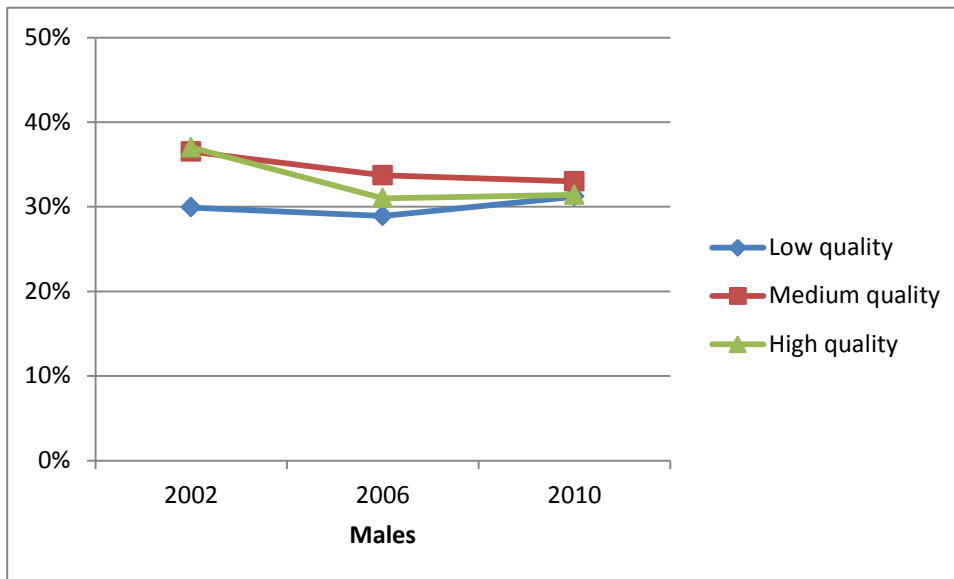
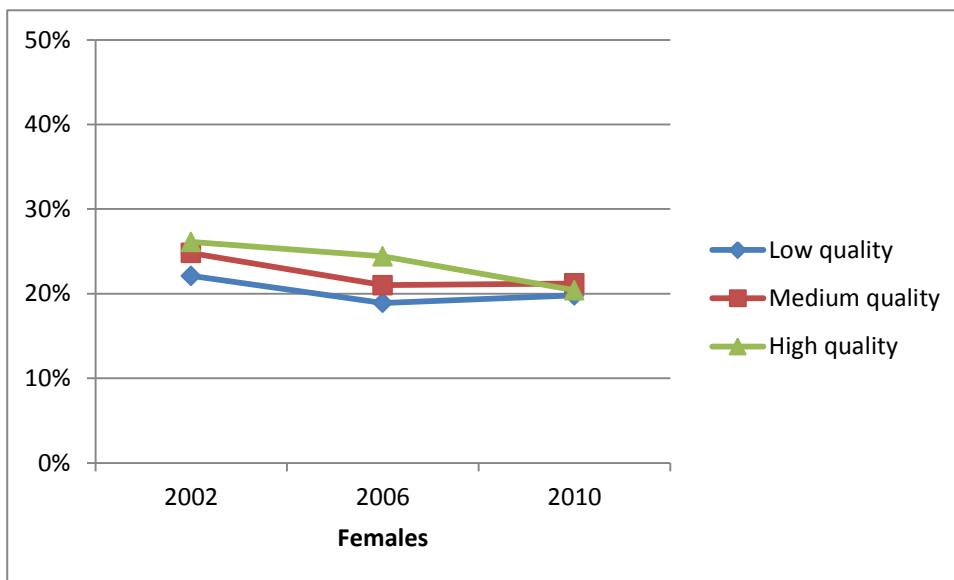


Figure 16.2: Percentage of Students Psychosomatic Symptoms, by Peer Relationship (Females only) HBSC 2002, 2006, and 2010



### *Trends in Mental Health*

**“The mental health of children and adolescents has emerged as an area of critical concern in Canada. An estimated 1.2 million Canadian children and youth are affected by mental illness, however, less than 20 per cent will receive appropriate treatment. With more than two-thirds of adults living with a mental health problem reporting that symptoms first appeared during their youth, establishing the foundation for healthy emotional and social development is vital to ensuring the mental well-being of all Canadians as they progress from childhood to adulthood”**  
(<http://www.mentalhealthcommission.ca/English/issues/child-and-youth>).

Consistent with the rising concern for adolescent mental health, the HBSC data reveal that the **adolescents’ reports of good mental health** declined steadily from 2002-2010. Approximately 15% fewer male and female adolescents reported having positive mental health in 2010 compared to 2002. Across all cycles, males generally reported better mental health than females. In all three cycles of data collection, having positive relationships with parents, peers, schools, and in the neighbourhood were associated with higher levels of mental health. This was one of three behaviours where the trend for all relationships was positively associated with a given health behaviour (i.e., mental health, quality of life, and alcohol). Males displayed average increases in the proportions reporting good mental health of 38.9% with high quality parent relationships, 14.7% with high quality peer relationships, 4% with high quality school relationships, and 12.6% with high quality neighbourhood relationships relative to males with low quality relationships (see Figures 17.1, 18.1, 19.1, and 20.1). Females displayed average increases in the proportions reporting good mental health and well-being of 36.9% with high quality parent relationships, 10.9% with high quality peer relationships, 3.4% with high quality school relationships, and 6.6% with high quality neighbourhood relationships relative to females with low quality relationships (see Figures 17.2, 18.2., 19.2, and 20.2).

Figure 17.1: Percentage of Students Reporting Positive Mental Health, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

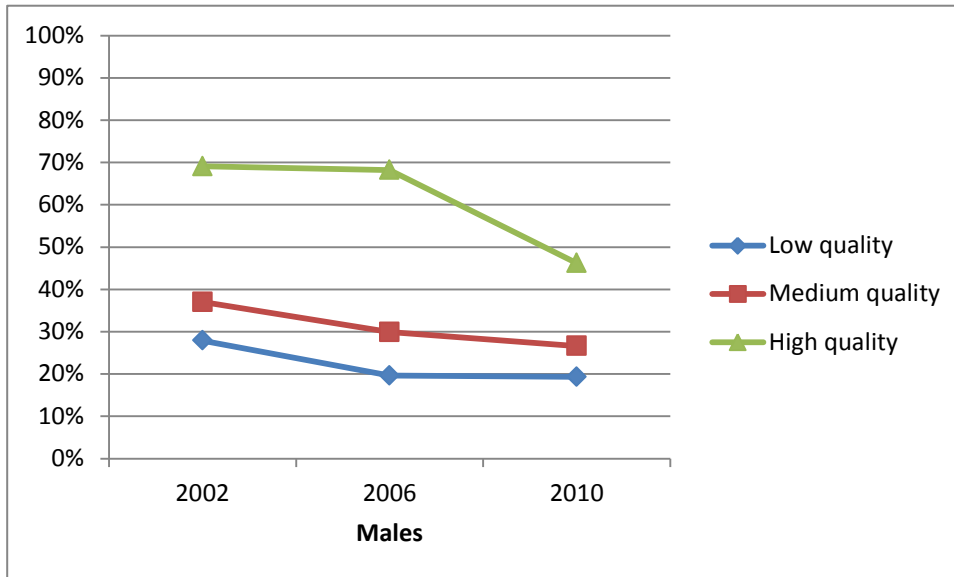


Figure 17.2: Percentage of Students Reporting Positive Mental Health, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

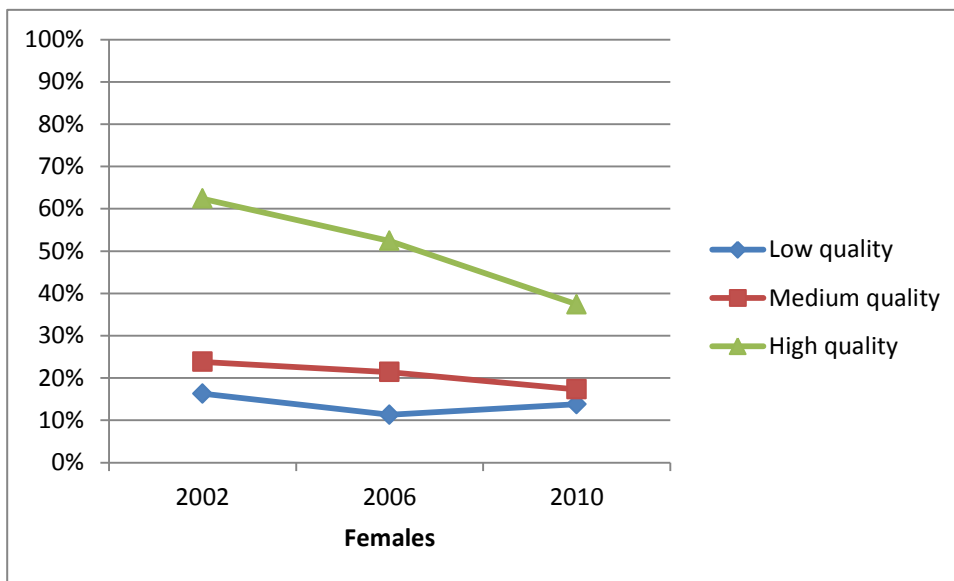


Figure 18.1: Percentage of Students Reporting Positive Mental Health, by Peer Relationship (Males only) HBSC 2002, 2006, and 2010

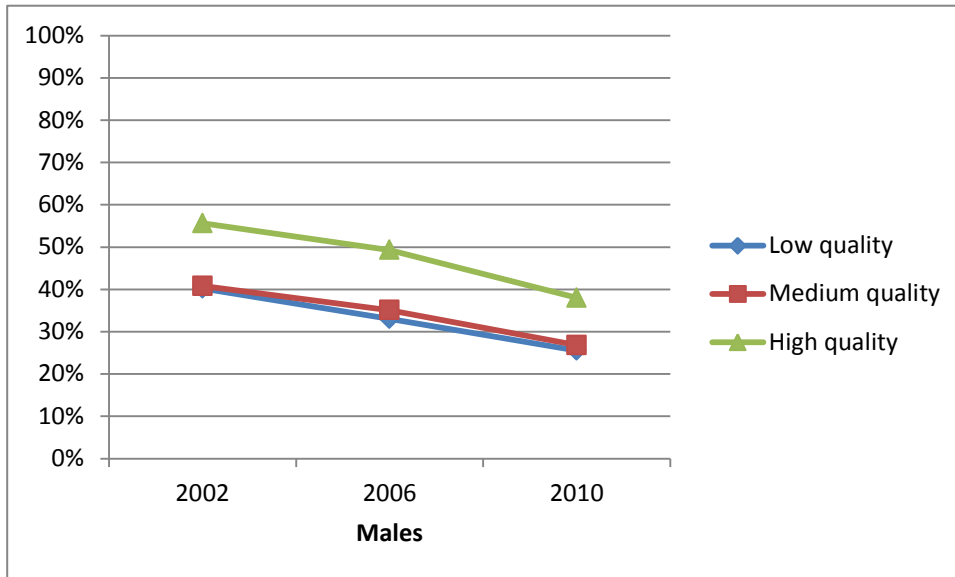


Figure 18.2: Percentage of Students Reporting Positive Mental Health, by Peer Relationship (Females only) HBSC 2002, 2006, and 2010

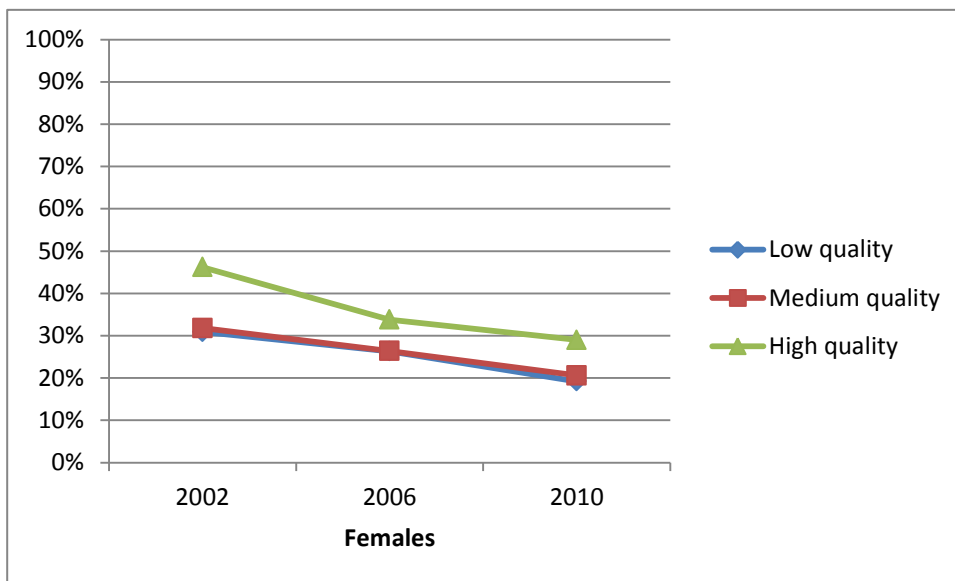


Figure 19.1: Percentage of Students Reporting Positive Mental Health, by School Relationship (Males only) HBSC 2002, 2006, and 2010

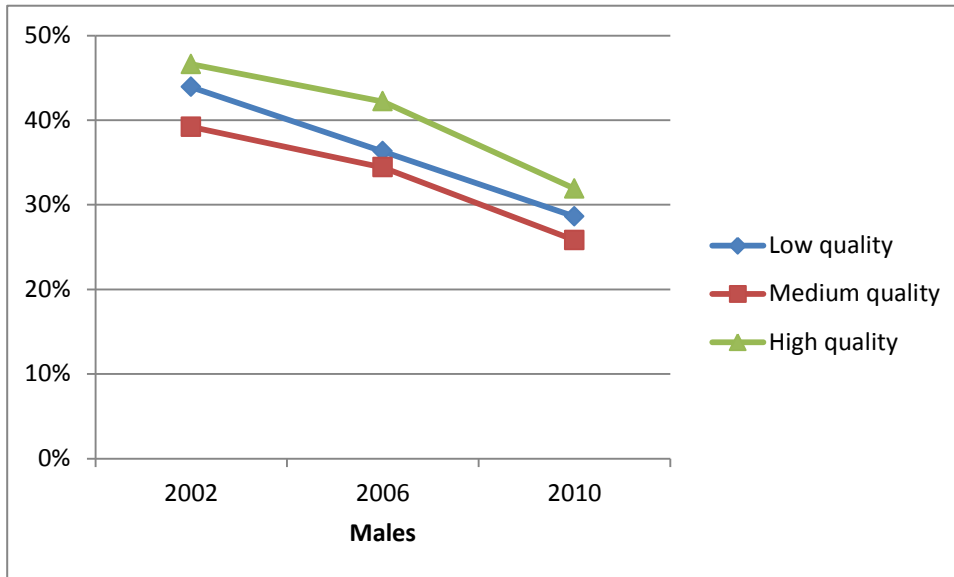


Figure 19.2: Percentage of Students Reporting Positive Mental Health, by School Relationship (Females only) HBSC 2002, 2006, and 2010

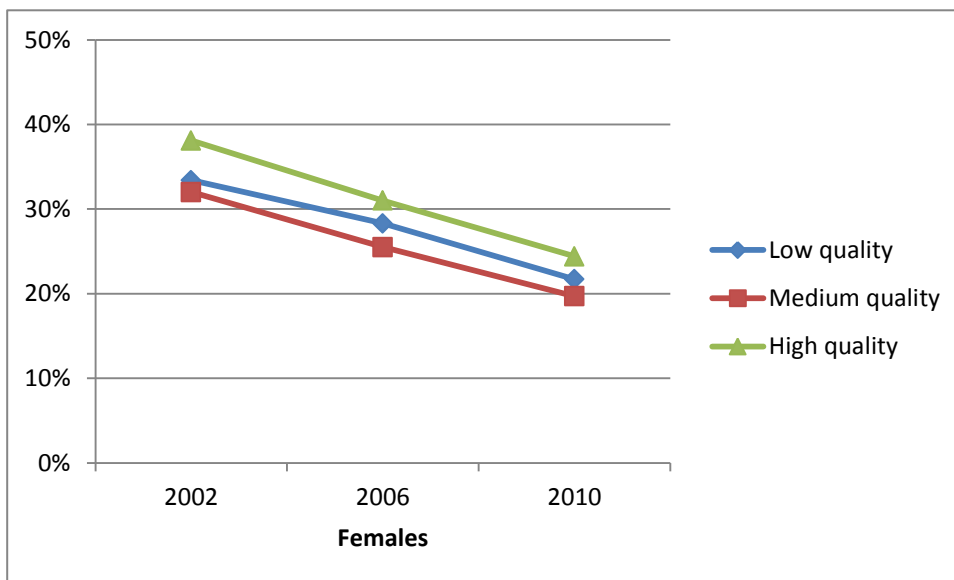




Figure 20.1: Percentage of Students Reporting Positive Mental Health, by Neighbourhood Relationship (Males only) HBSC 2002, 2006, and 2010

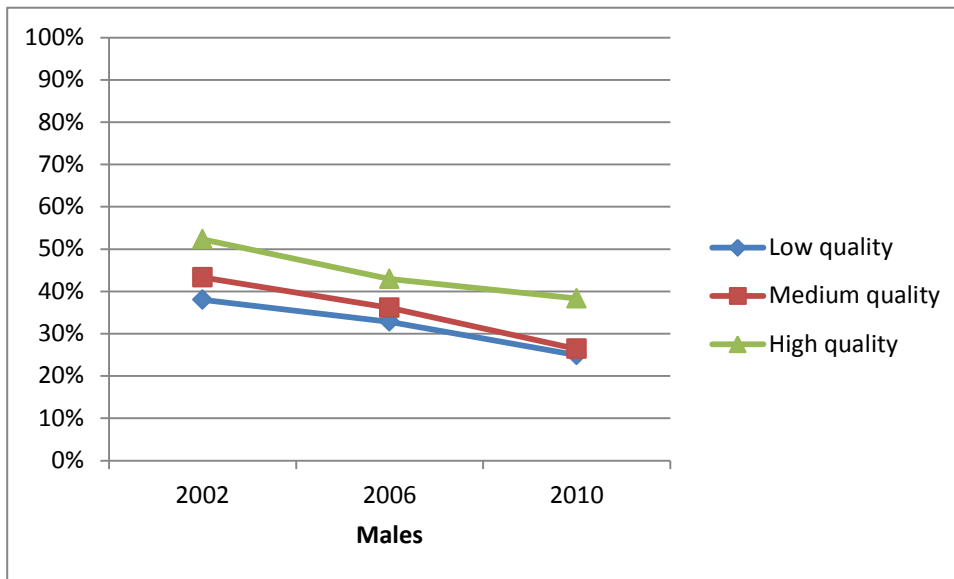
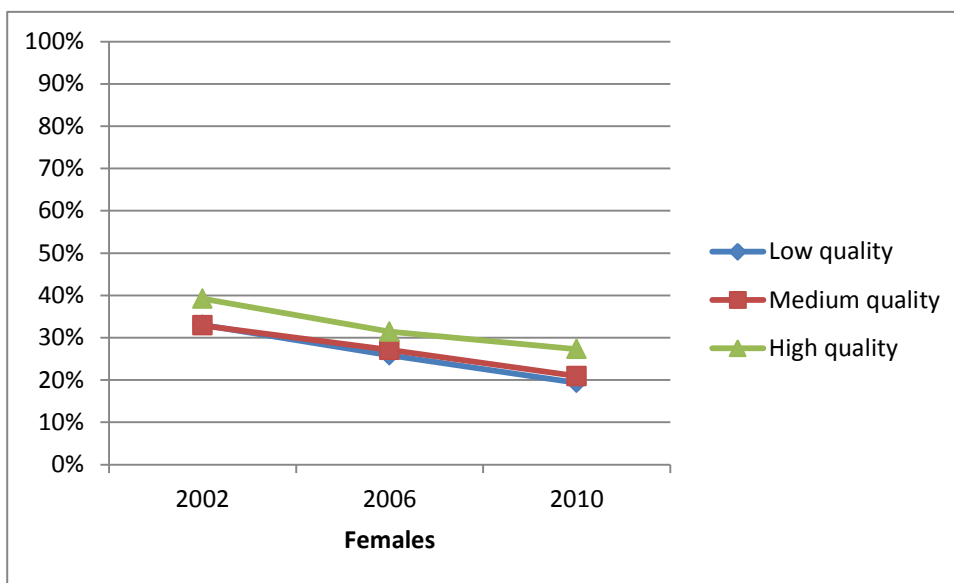


Figure 20.2: Percentage of Students Reporting Positive Mental Health, by Neighbourhood Relationship (Females only) HBSC 2002, 2006, and 2010



## **Trends in Aggressive Behaviour and Links to Relationship Quality**

### *Trends in Bullying*

Bullying is the use of power and aggression to control and distress another (Pepler & Craig, 2011). **Canada's rates of bullying fall in the lower half in international rankings (Molcho, Craig, et al., 2010).** Children who persistently bully others experience a wide range of social and emotional problems. They are more likely to have strained relationships through childhood and adolescence with both their parents and peers compared to those who do not bully (Pepler, et al., 2008). Longitudinal research indicates that males who bully are at risk for carrying this troubling relationship pattern into adulthood and into their parenting, thereby transferring bullying behaviours to the next generation (Ttofi, Farrington, Lösel, & Loeber, 2011).

Across all three cycles, males were more likely to report engaging in bullying behaviour than females. Similar to the decrease in the proportion of youth reporting positive mental health and well-being across time, there was a trend across the three cycles for both males and females to report engaging in more bullying behaviour. This trend for increased reports of bullying over time was most marked for those who had a low quality relationship with their parents.

Quality of relationships with parents was consistently related to lower levels of bullying in all three data cycles. A high quality parent relationship was associated with a 15.3% lower prevalence in reports of bullying behaviour of 15.3% for males and 20% for females, compared to those with a low quality relationship (see Figures 21.1 and 21.2). An interaction with gender was observed, indicating that the association of bullying with the quality of parental relationships is stronger for females than for males (i.e., a steeper slope among females). The quality of peer relationships was **also negatively associated with youths' reports of bullying behaviour in 2006 and 2010. Finally, low** quality of school relationships was associated with bullying behaviour in 2002 and 2006, but not in 2010. Quality of neighbourhood relationship was not significantly associated with bullying across any of the cycles.

Figure 21.1: Percentage of Students Reporting Engaging in Bullying, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

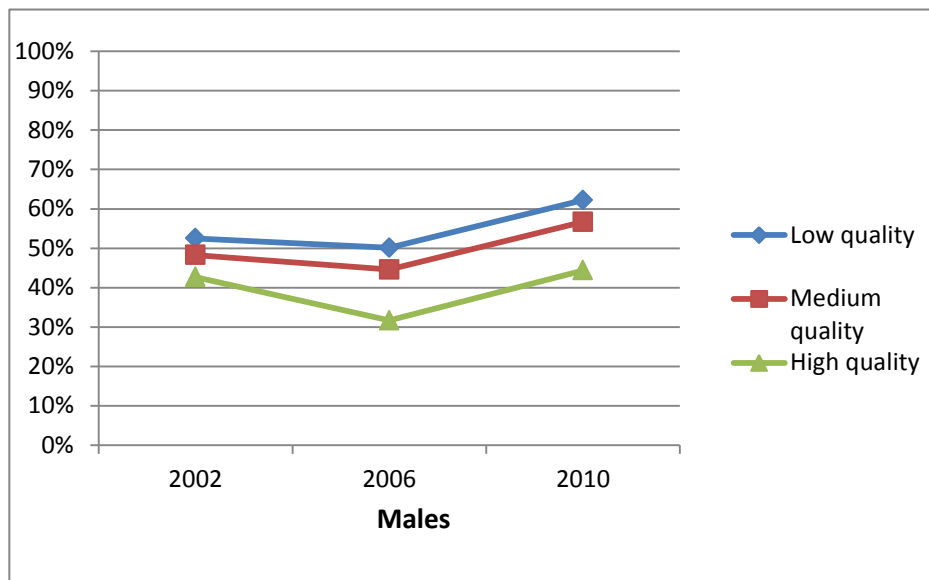
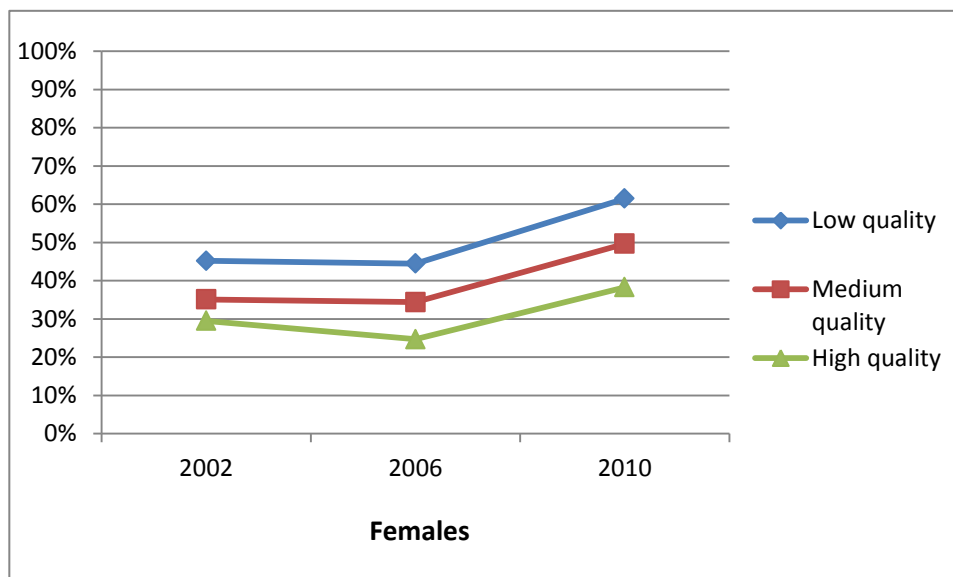


Figure 21.2: Percentage of Students Reporting Engaging in Bullying, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010



### *Trends in Victimization by Bullying*

Children who are victimized at the hands of their peers have chronic physical and social-emotional health problems, as well as academic problems, most likely linked to the stress of being bullied (Craig, 1998; Vaillancourt et al., 2011). Canada ranks in the bottom third of rich countries in the proportion of youth who report being bullied (UNICEF, 2013). One in three Canadian youth reports having been bullied at least one in the past month (UNICEF, 2013).

Paralleling the increase over the three cycles in the prevalence of bullying, there was a significant increase in the prevalence of victimization, accounted for primarily by a steep increase from 2006 to 2010 in the rates of being bullied for both males and females. In the first two cycles, there were no marked gender differences in the reports of being bullied; however, in 2010, females reported higher rates than males.

The quality of relationships with both parents and peers was associated with the prevalence of peer victimization across all three data cycles. A positive relationship with parents was associated with an average decrease in the prevalence of victimization of 12.7% for both males and females (see Figures 22.1 and 22.2, respectively). A high quality relationship with peers was associated with an average decrease in the prevalence of victimization of 19% for both males and females (see Figure 3.1 and 23.2, respectively). **The quality of youths' relationships with school was associated with victimization in 2010 only when the rates were the highest. The quality of youths' relationships within their neighbourhoods was unrelated to victimization in all three cycles.**

Figure 22.1: Percentage of Students Reporting Victimization, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

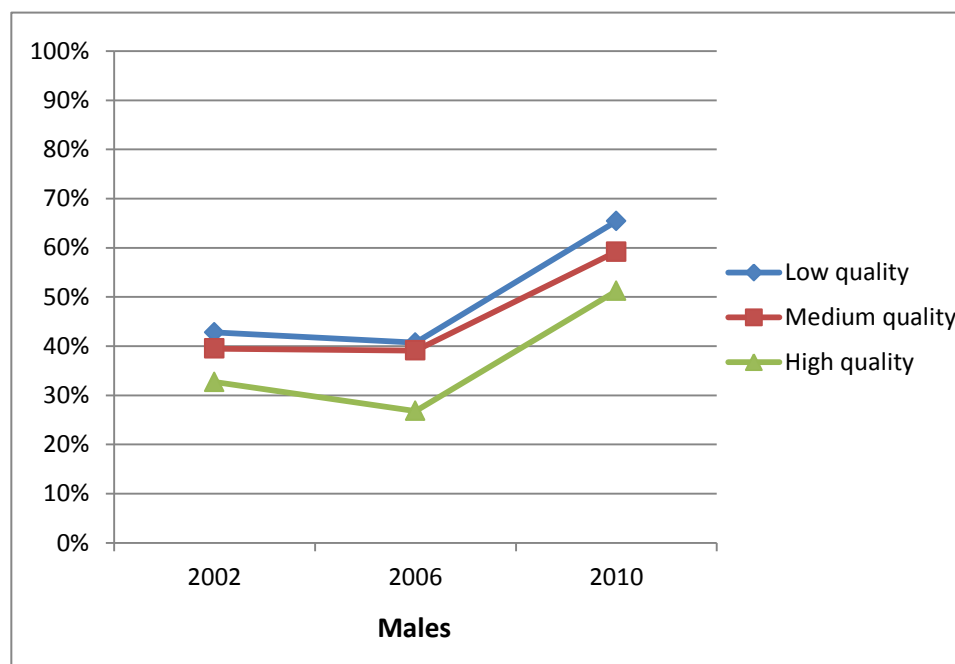


Figure 22.2: Percentage of Students Reporting Victimization, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

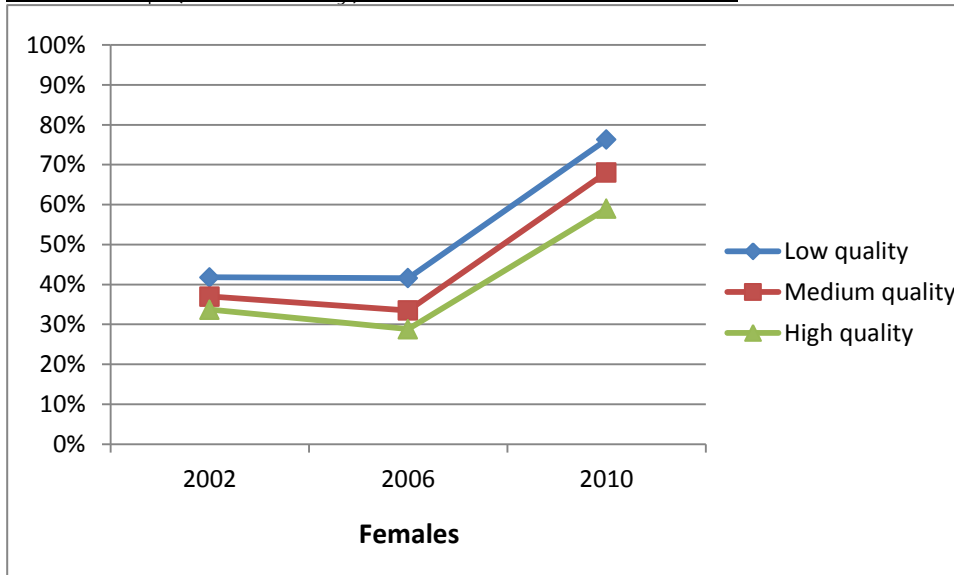


Figure 23.1: Percentage of Students Reporting Victimization, by Peer Relationship (Males only) HBSC 2002, 2006, and 2010

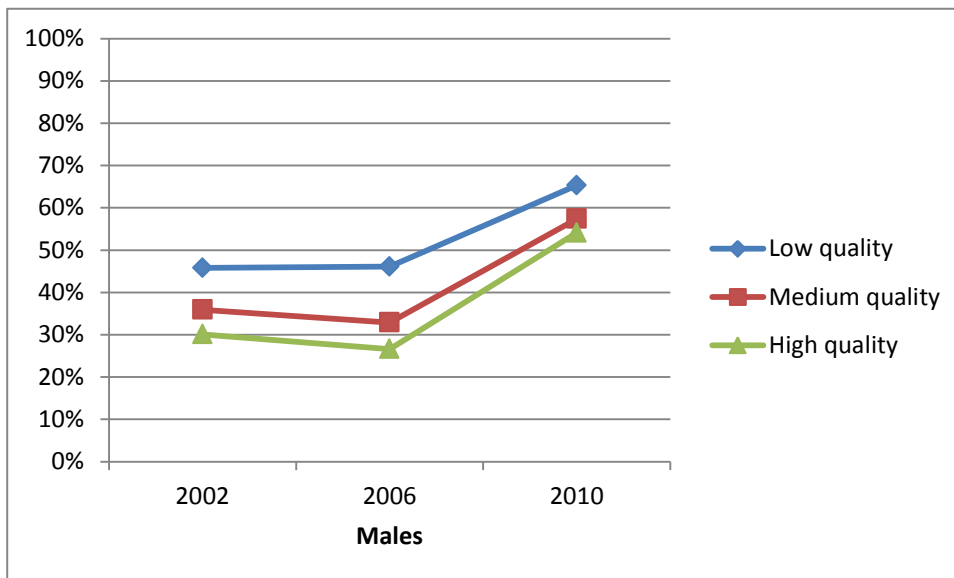
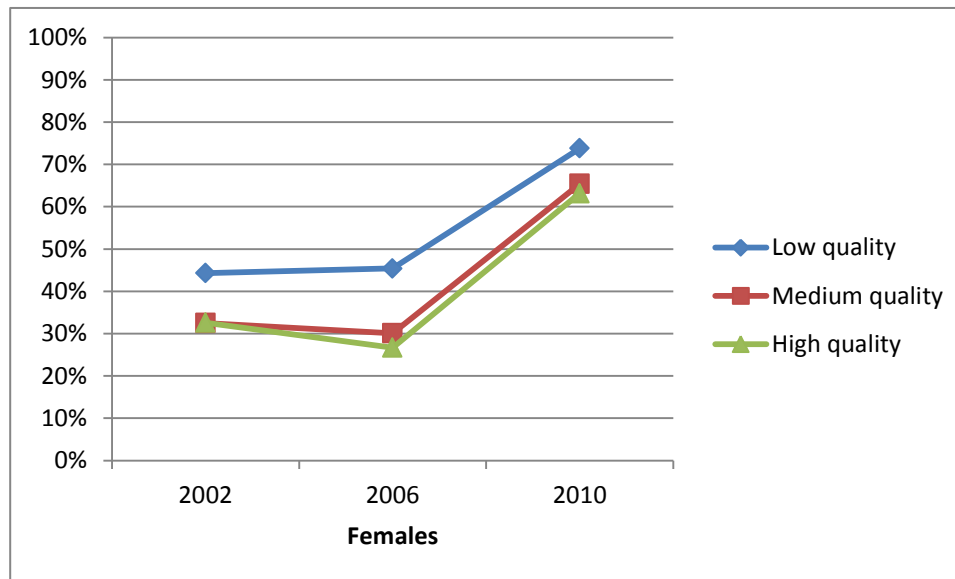


Figure 23.2: Percentage of Students Reporting Victimization, by Peer Relationship (Females only) HBSC 2002, 2006, and 2010



### *Trends in Fighting*

**On international rankings of youths' involvement in fighting, Canada ranks in the middle of** developed countries (UNICEF, 2013). Approximately one-third of Canadian youths report that they have been involved in a physical fight at least once in the past year. Youth violence is a major concern in most countries and physical fighting is the most common manifestation of such violence. Physical fighting increases risks for injury and relates to substance use and other problem behaviors (Pickett et al., 2012). Children who fight report lower life satisfaction, poorer family and peer relationships, and worse perceptions of their school environments than do children not involved in fighting.

Physical fighting was most common in 2006, and males were much more likely to engage in physical fights than females across all three cycles. A high quality relationship with both parent and school was protective against being involved in physical fights across all three cycles. High quality parent relationships were associated with a decrease in the proportion of youths who reported physical fighting of 12.5% for males and 17.3% for females (see Figures 24.1 and 24.2). High quality school relationships were associated with an average decrease in the prevalence of physical fighting of 6.4% for males and 6.4% for females (see Figures 25.1 and 25.2). A low quality of relationship with parents and schools differentiated females involved in fighting to a greater extent than males. In 2002 only the quality of peer and neighbourhood relationships was also inversely related to involvement in physical fights.

Figure 24.1: Percentage of Students Reporting Physical Fights, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

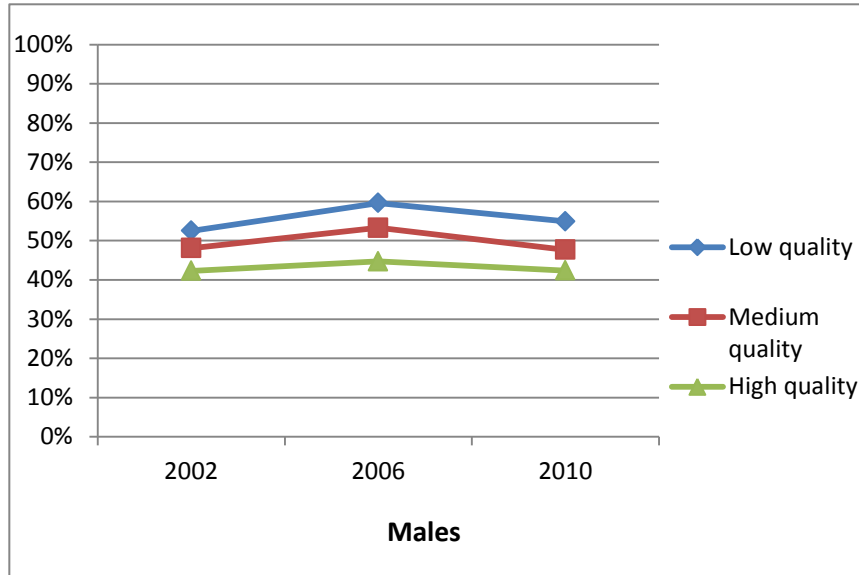


Figure 24.2: Percentage of Students Reporting Physical Fights, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

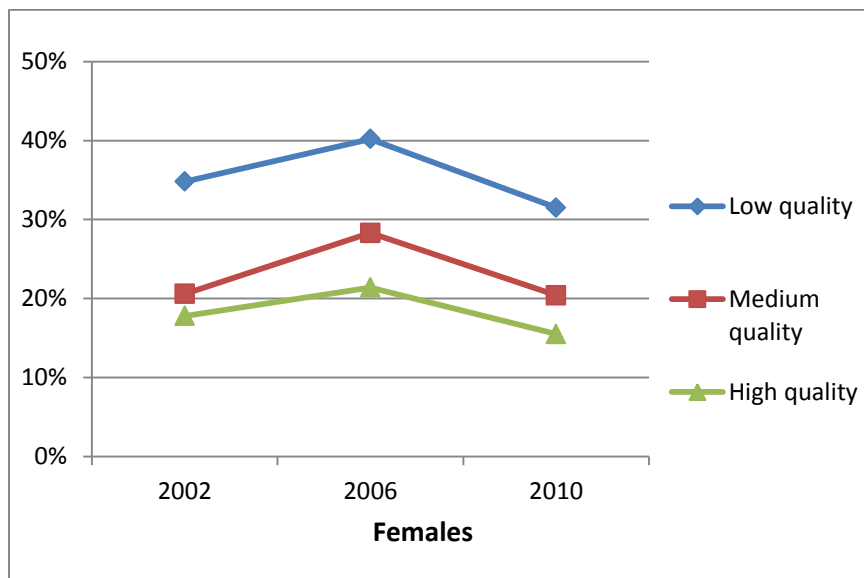


Figure 25.1: Percentage of Students Reporting Physical Fights, by School Relationship (Males only) HBSC 2002, 2006, and 2010

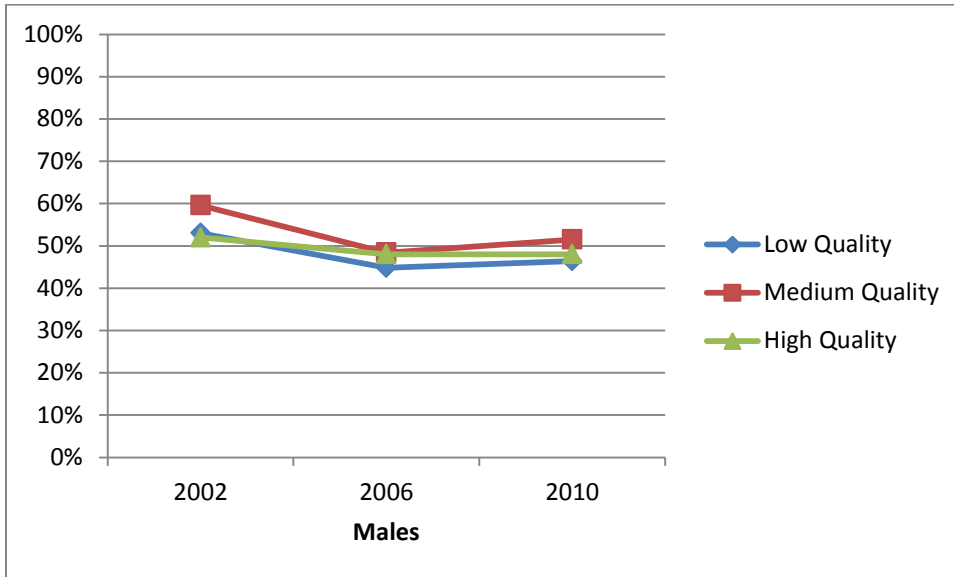
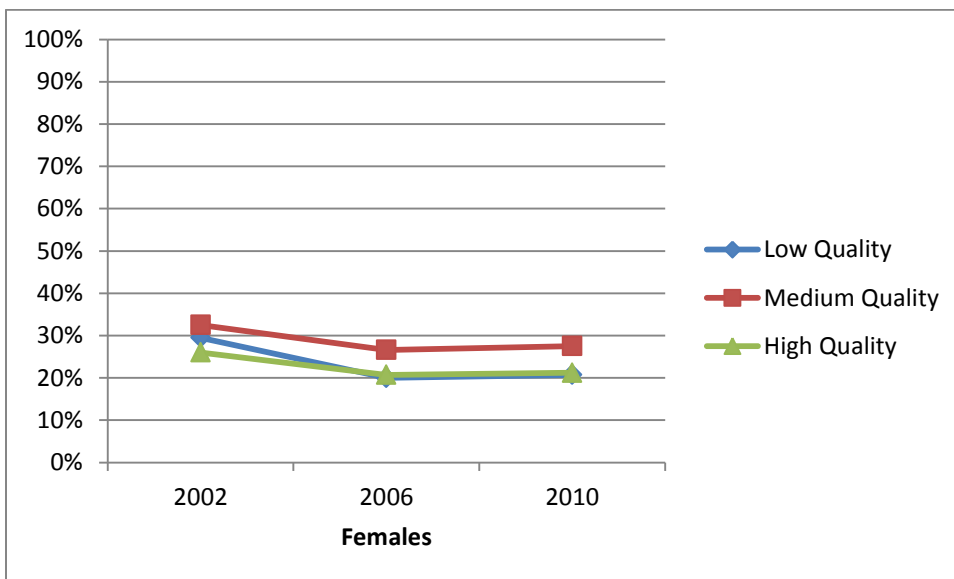


Figure 25.2: Percentage of Students Reporting Physical Fights, by School Relationship (Females only) HBSC 2002, 2006, and 2010





## **Trends in Substance Use and Links to Relationship Quality**

### *Trends in Smoking Tobacco*

In spite of extensive evidence and public health notices that smoking is detrimental to health, there are still Canadian youth who report smoking a cigarette at least once a week. On the international stage, Canada ranks third: only Iceland and Norway have fewer youth who report engaging in this harmful health behaviour (UNICEF, 2013). There is reason to be concerned for the youth who smoke, not only for the detrimental health effects, but also because smoking has been identified as a gateway to the use of illegal substances (La et al., 2000). In addition, the vast majority of adult smokers report that they started in adolescence (Dodge et al., 2009).

The HBSC data reveal trends for both male and female adolescents: the rates of smoking have steadily declined from 2002 to 2010, most likely a reflection of the continuing public health efforts to curb smoking. Across all three cycles, high quality parent and school relationships were protective against the risk of smoking. A high quality relationship with parents was associated with a decrease in the prevalence of smoking of 8.7% among males and 13.7% among females (see Figures 26.1 and 26.2). Among both males and females, it was those with a low quality of relationship with parents who were most likely to report smoking; those with a medium and high quality relationship were similarly lower risk. A high quality relationship with school was associated with a decrease in the prevalence of smoking of 5.9% among males and 9.4% among females (see Figures 27.1 and 27.2). Strong parent and school relationships were particularly protective for females (i.e., steeper slope). The quality of peer relationships was related to smoking in the expected direction in 2002 and 2006, but not in 2010. Neighbourhood relationships were not related to increased risk for smoking across any of the three cycles. No clear gender differences were observed.

Figure 26.1: Percentage of Students Reporting Smoking Tobacco, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

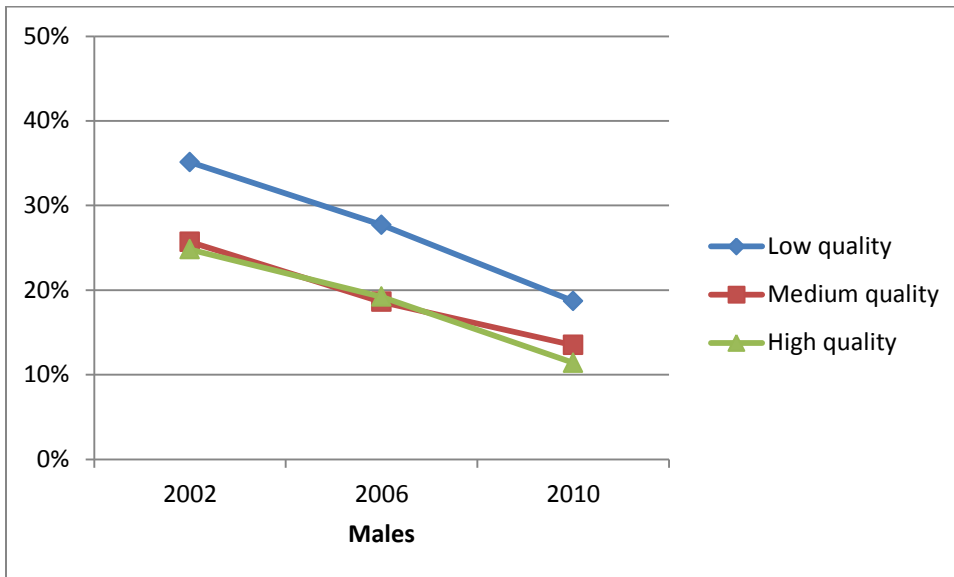


Figure 26.2: Percentage of Students Reporting Smoking Tobacco, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

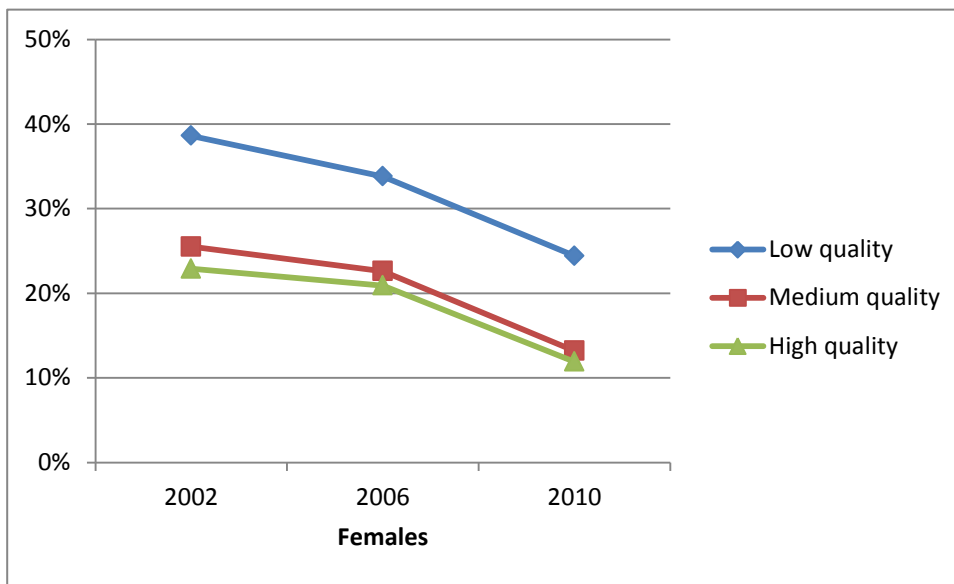


Figure 27.1: Percentage of Students Reporting Smoking Tobacco, by School Relationship (Males only) HBSC 2002, 2006, and 2010

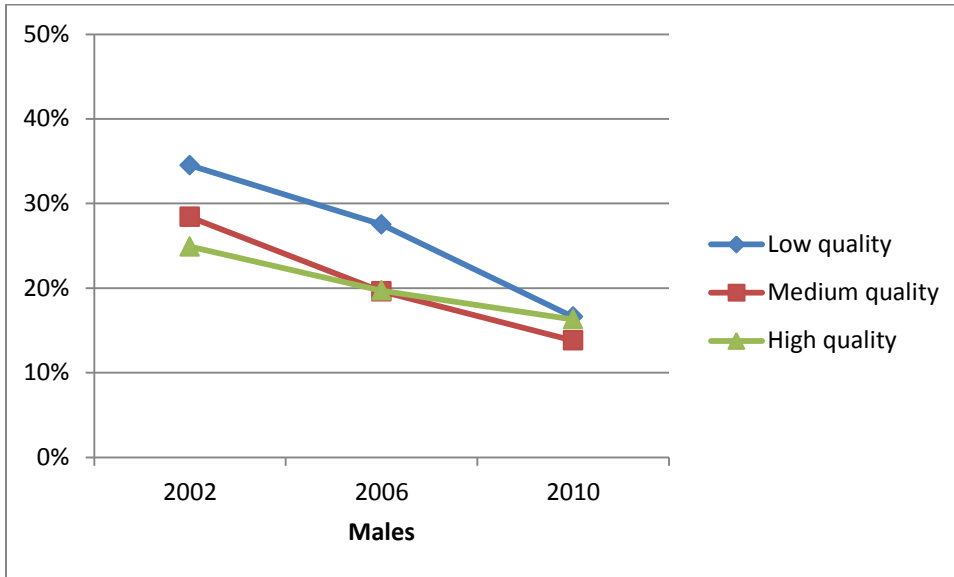
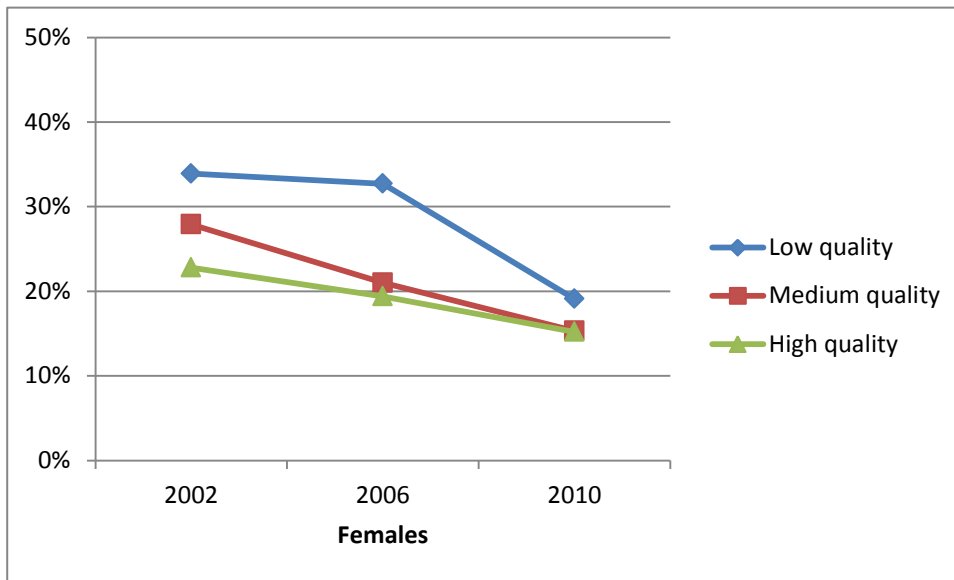


Figure 27.2: Percentage of Students Reporting Smoking Tobacco, by School Relationship (Females only) HBSC 2002, 2006, and 2010



### *Trends in Drinking Alcohol*

Although experimenting with alcohol is relatively normal during adolescence, those youths who start drinking in early adolescence are at risk for a range of problems including later alcohol problems (Hawkins et al., 1997) and are at risk for initiating other drugs (Kandel, Yamaguchi, & Chen, 1992).

**The normative nature of alcohol experimentation in adolescence may point to youths' use of alcohol** in response to peer pressure and as a way of connecting with peers in a social context (Dodge et al., 2009).

The HBSC data reveal that the rates of alcohol consumption among Canadian adolescents increased from 2002 to 2006 and then dropped to the lowest point in 2010. The quality of all relationships was related to alcohol consumption, but not always in the expected direction. The quality of both parent and school relationships was related as expected: high quality relationships were protective against **youths' reports of drinking alcohol. A high quality parent relationship reduced rates of alcohol** consumption by 9.8% for males and 20.1% for females (see Figures 28.1 and 28.2). An interaction with gender was observed here: high quality parent relationships were more protective for females than for males (i.e., steeper slope). A high quality school relationship also related to lower rates of alcohol consumption by 10.1% for boys and 11.3% for girls (see Figures 30.1 and 30.2). In contrast, **the quality of adolescents' relationships with their peers and neighbourhood** was associated in the opposite direction (see Figures 29.1 and 29.2 for peers and Figures 31.1 and 31.2 for neighbourhood data). High quality peer relationships corresponded to increased alcohol consumption by 6.3% among males and 1% among females. High quality neighbourhood relationships corresponded to increased alcohol consumption by 7.5% among males and 1.5% among females. As these data indicate, the unexpected increases were more dramatic for males than females.

Figure 28.1: Percentage of Students Reporting Consuming Alcohol, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

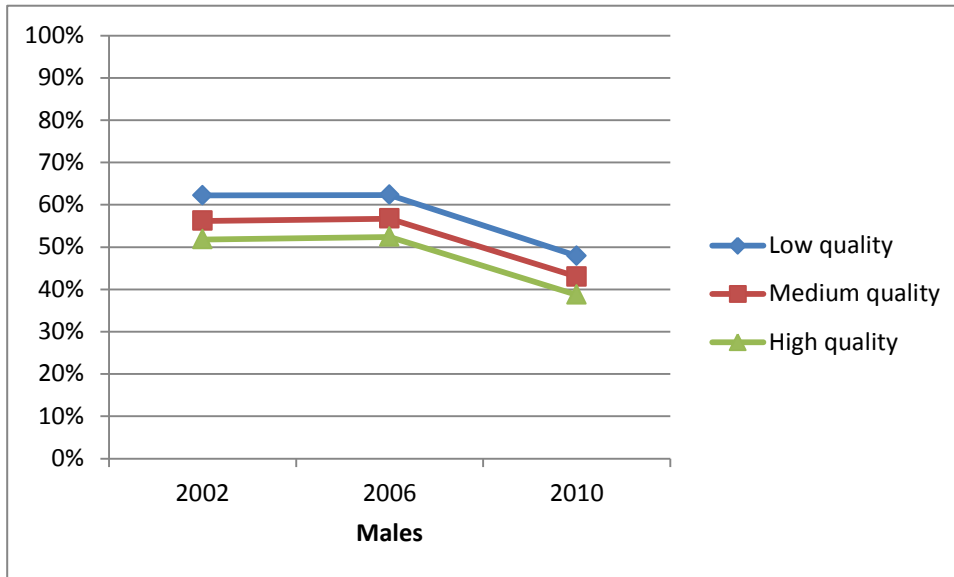


Figure 28.2: Percentage of Students Reporting Consuming Alcohol, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010

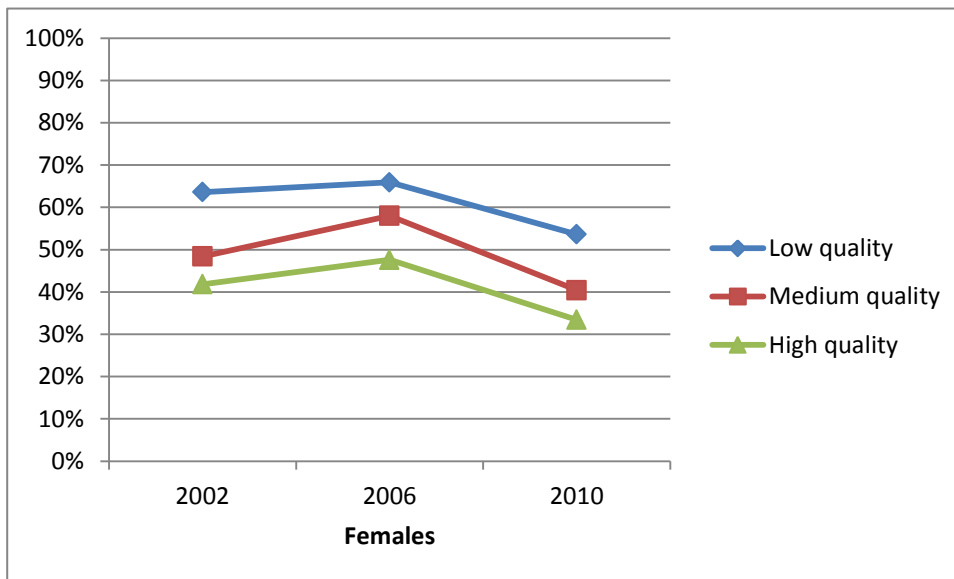


Figure 29.1: Percentage of Students Reporting Consuming Alcohol, by Peer Relationship (Males only) HBSC 2002, 2006, and 2010

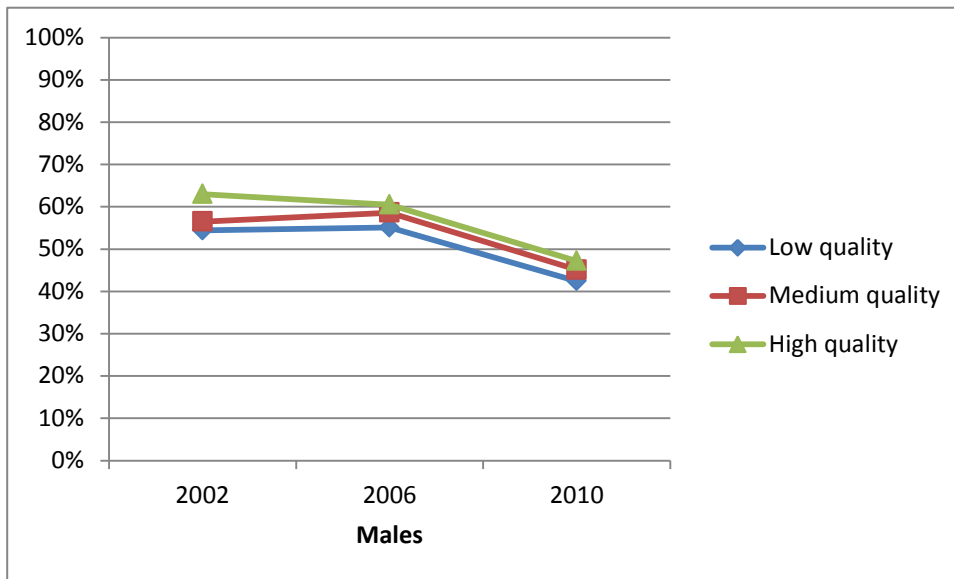


Figure 29.2: Percentage of Students Reporting Consuming Alcohol, by Peer Relationship (Females only) HBSC 2002, 2006, and 2010

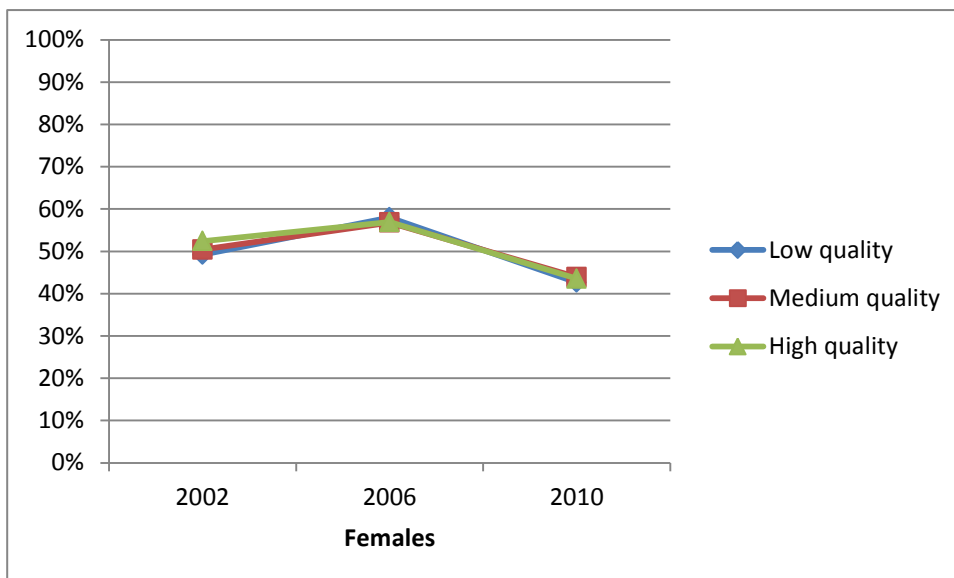


Figure 30.1: Percentage of Students Reporting Consuming Alcohol, by School Relationship (Males only) HBSC 2002, 2006, and 2010

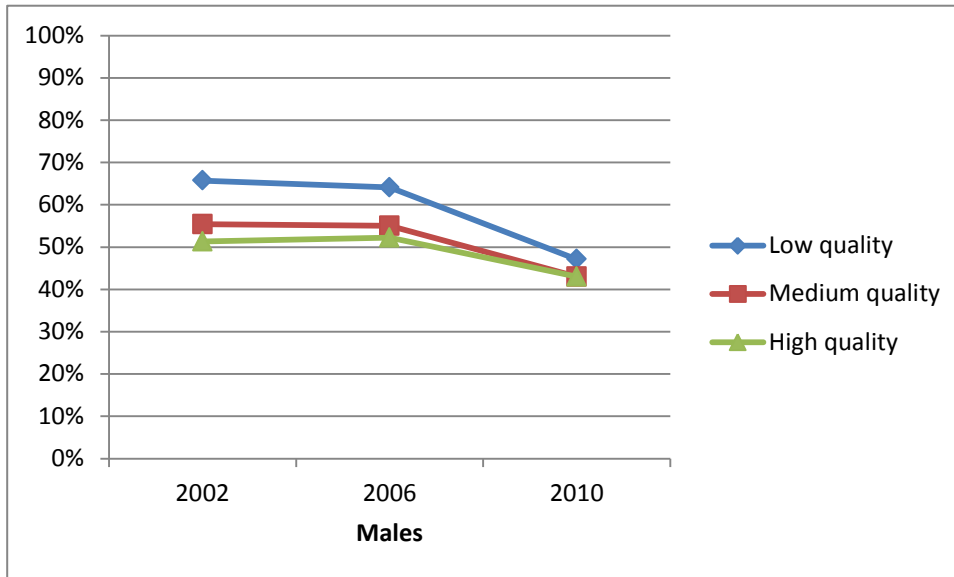


Figure 30.2: Percentage of Students Reporting Consuming Alcohol, by School Relationship (Females only) HBSC 2002, 2006, and 2010

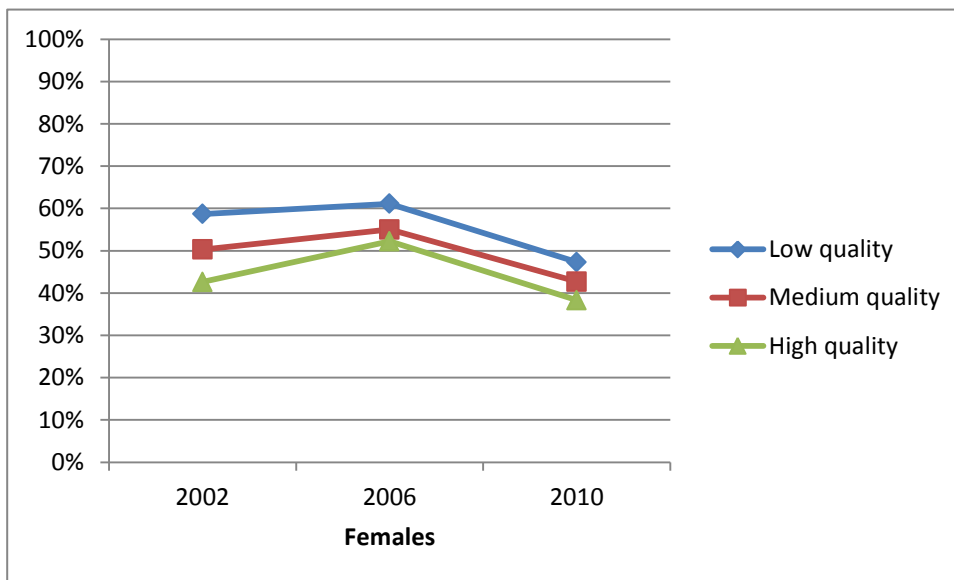


Figure 31.1: Percentage of Students Reporting Consuming Alcohol, by Neighbourhood Relationship (Males only) HBSC 2002, 2006, and 2010

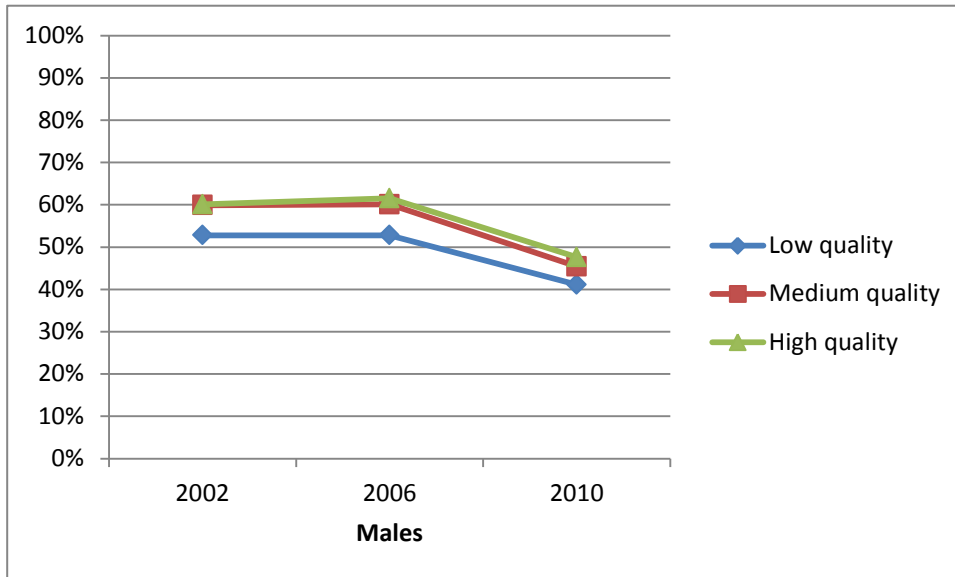
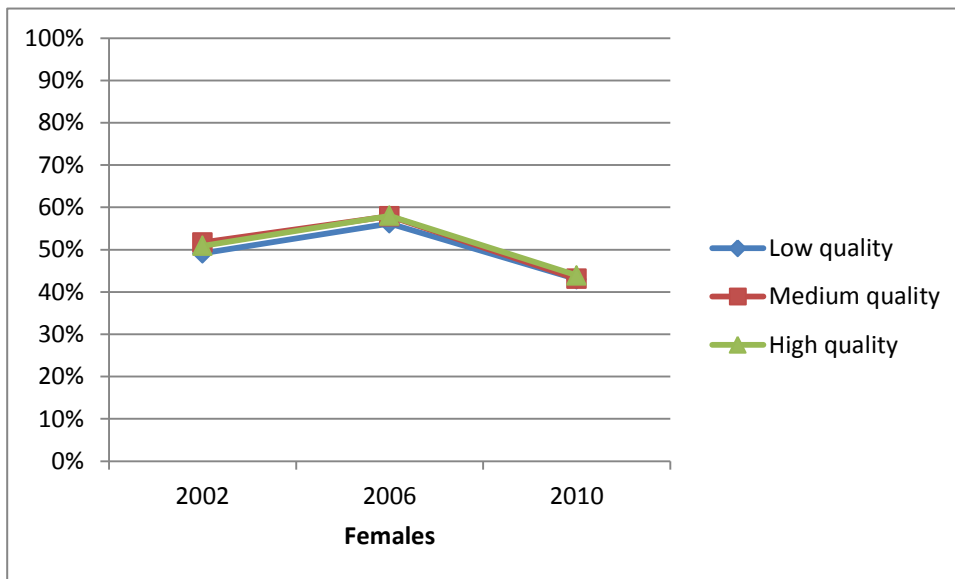


Figure 31.2: Percentage of Students Reporting Consuming Alcohol, by Neighbourhood Relationship (Females only) HBSC 2002, 2006, and 2010





### *Trends in Smoking Cannabis*

In a recent UNICEF (2013) report, Canada ranked as the country with the highest proportion of youth reporting that they had used cannabis in the last 12 months. Over a quarter of Canadian youth aged 11, 13 and 15 reported cannabis use. This pattern of highest cannabis use for Canadian youth has been consistent: in the 2007 UNICEF report of well-being of children in rich countries, Canada ranked as the country with the most cannabis use. Canada was the only country with a cannabis use rate of over 40% among 15 year-olds in the last 12 months. There is evidence to **suggest that the quality of youths' relationships is linked to cannabis use. Dishion and colleagues (1999) found that parents' harsh discipline and poor monitoring** related to higher cannabis use. They also found that youth who were rejected by their friends and those who had deviant friends were more likely to begin using cannabis early. Using Canadian data, Leatherhead and colleagues (2008) reported that those youth with poorer school performance were more likely to report using cannabis.

In the HBSC data, only the quality of parent relationships was consistently related to cannabis use, such that high quality parent relationships were related to a 16.7% lower prevalence of cannabis use for both males and females (see Figures 32.1 and 32.2). The quality of peer relationships was negatively related to cannabis use in 2006 and 2010, but not 2002. For school relationships, high quality relationships were negatively related to cannabis use in 2002 and 2006, but not 2010. Neighbourhood relationship quality was associated with cannabis use in 2006 only. Although rates of cannabis use have declined steadily from 2002-2010, with over 25% of youth reporting cannabis smoking in 2010, Canada remains the country that has the highest rate among 29 European and North American countries (UNICEF 2013).

Figure 32.1: Percentage of Students Reporting Smoking Cannabis, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

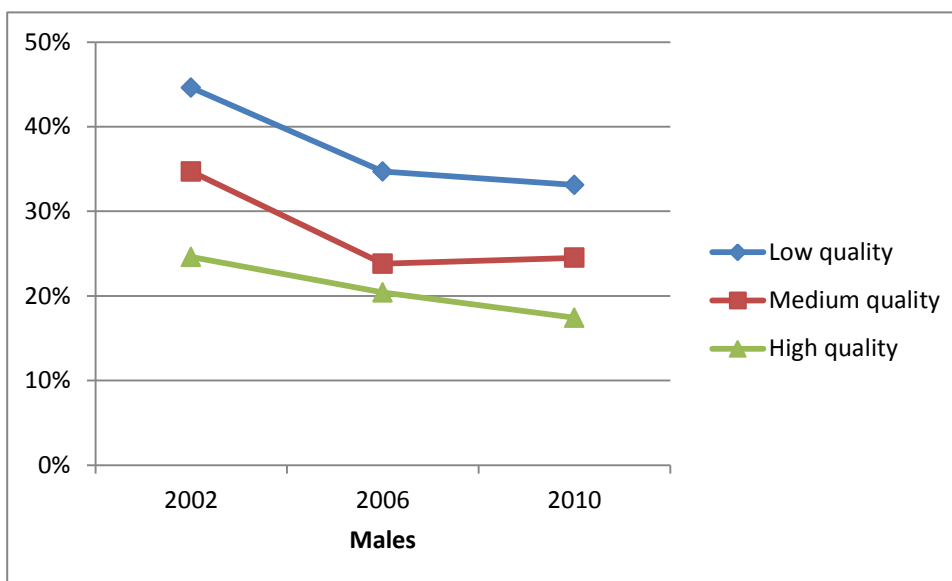
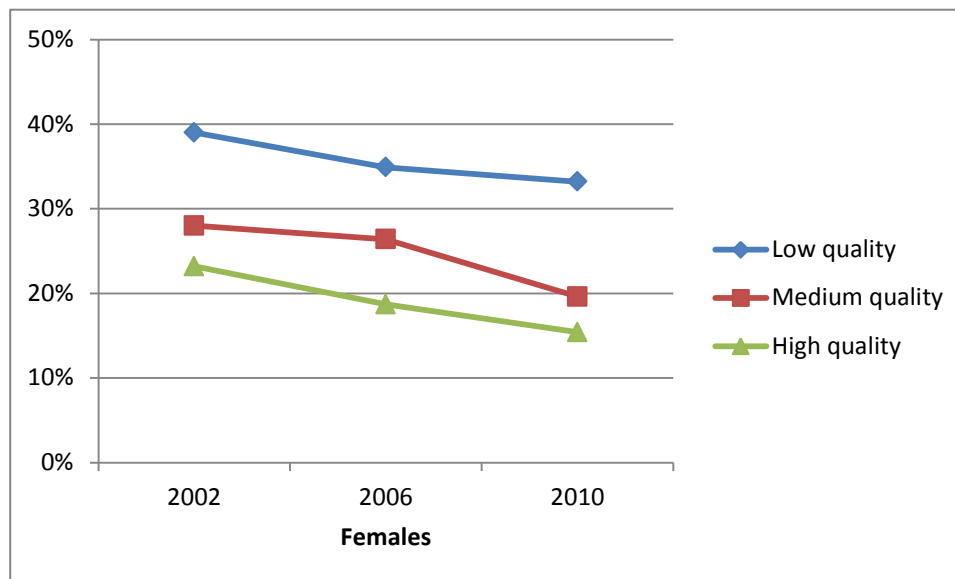


Figure 32.2: Percentage of Students Reporting Smoking Cannabis, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010



#### *Trends in Hard Drug Use*

Similar to early entry into smoking and alcohol, there is evidence that youths who begin to use hard drugs in early adolescence are likely to go onto use other illicit substances, abuse substances, and have a range of maladaptive outcomes, including antisocial behaviour (Dodge et al., 2009). Both poor quality parent and peer relationships have **been implicated in youths' development of substance use problems** (Duncan et al., 2006; Lee & Bell, 2003).

In the HBSC survey, the quality of relationship with parents was the only factor consistently related to hard drug use. High quality parent relationships corresponded to reductions in hard drug use of 9.5% for males and 9.1% for females (See Figures 33.1 and 33.2). Hard drug use was associated with peer relationships in 2006 only and neighbourhood relationships in 2002 and 2006, but not 2010. Quality of relationship with neighbourhood was not associated with hard drug use in any of the survey years. There was no consistent interaction with gender, and hard drug use declined dramatically from 2002 to 2010.

Figure 33.1: Percentage of Students Reporting Hard Drug Use, by Parent Relationship (Males only) HBSC 2002, 2006, and 2010

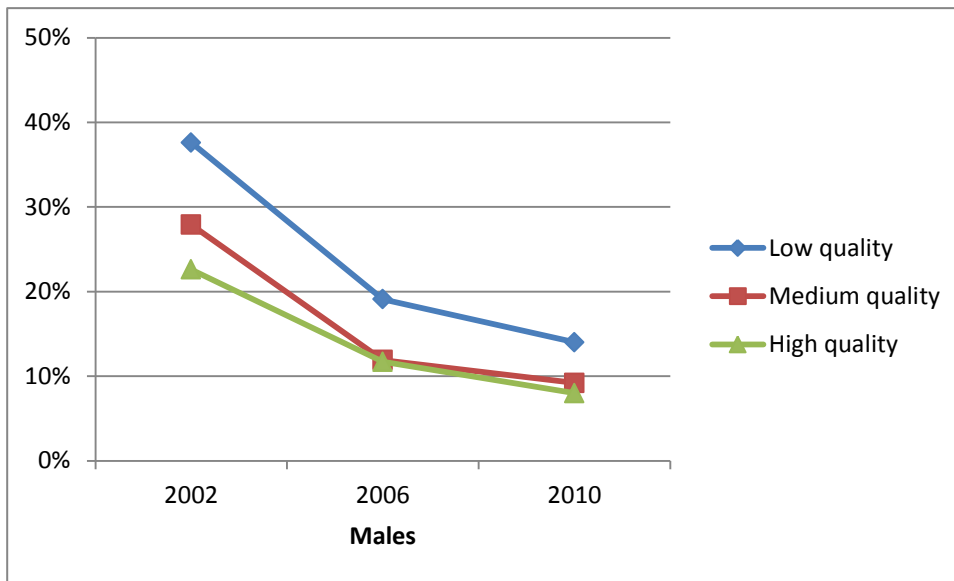
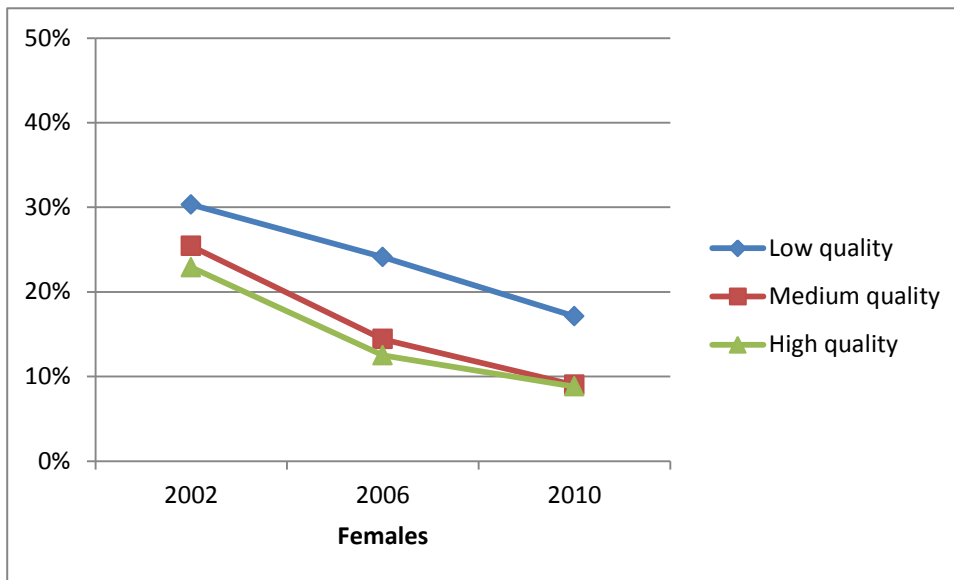


Figure 33.2: Percentage of Students Reporting Hard Drug Use, by Parent Relationship (Females only) HBSC 2002, 2006, and 2010



## Sexual Behaviour Domain

### *Trends in Sexual Activity*

For youth, making responsible and informed sexual choices is essential to their development and transition into adulthood. Sexual attitudes and behaviours are established early and often carry through across the life course. Some riskier sexual behaviours – including early sexual activity, infrequent use of condoms and multiple partners – increase the risk of acquiring STIs as well as unplanned pregnancies (Adler et al., 2007). The more knowledge, skills and information that are provided to youth and young adults, the better control individuals have over their own sexuality and choices (Hansen et al., 2004).

In the HBSC survey, the quality of relationships with schools was the only factor consistently related to having sexual intercourse. High quality school relationships corresponded to reductions in having sexual intercourse of 7% for males and 8.3% for females (See Figures 33.1 and 33.2). Having sexual intercourse was related to high quality parent relationships in 2002 and 2010. Having sexual intercourse was associated with peer relationships in 2002. No relationship type was significantly associated with having sexual intercourse in 2010.

Figure 34.1: Percentage of Students reporting having sexual intercourse, by quality of school relationship (Males only)

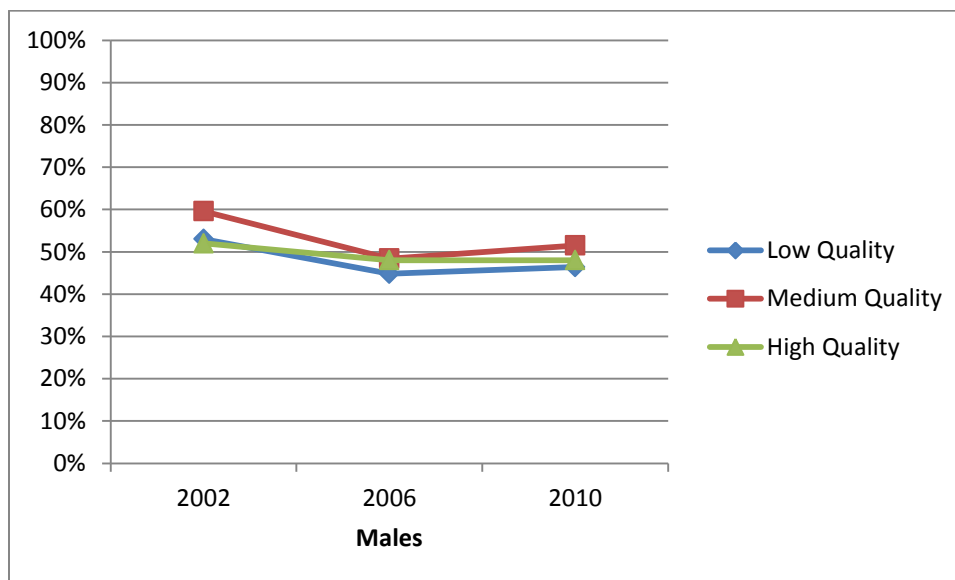
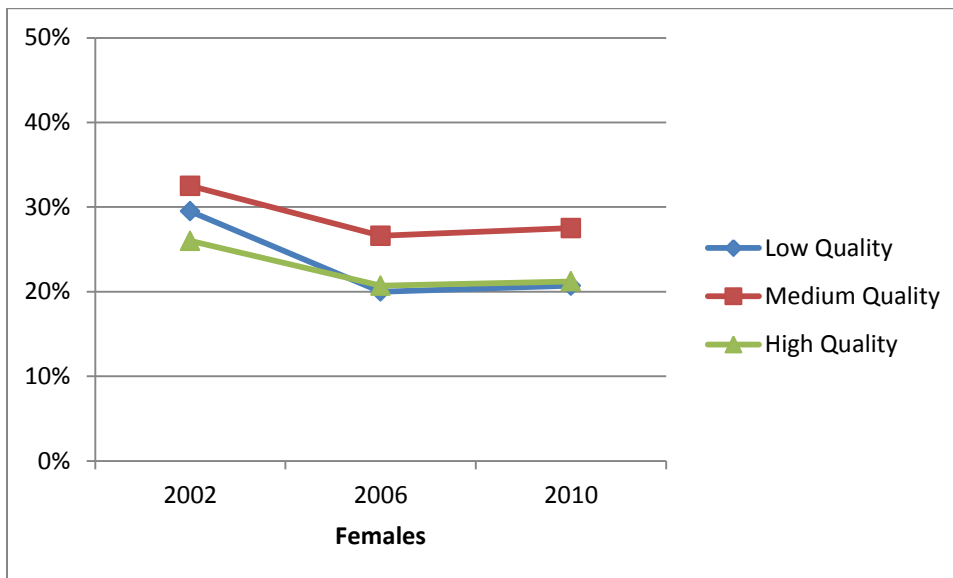


Figure 34.2: Percentage of Students reporting having sexual intercourse, by quality of school relationship (Females only)



## Summary

The goal of this report was to examine trends in the quality of relationships with parents, peers, schools, and neighbourhoods, as well as the trends in how the quality of these relationships was associated with health behaviours. The discussion is divided into three sections: 1) Trends in the quality of relationships; 2) Trends in the association between relationship quality and health behaviours; and 3) Limitations. A summary of trends is provided in Table 3 below.

### Trends in Relationship Quality from 2002-2010

A review of youths' reports of their relationships reveals some interesting trends within and across the parent, peer, school, and neighbourhood relationships. Across this eight-year period, there was a general decrease in the proportions of youths who reported a high quality relationship with their parents, schools, and neighbourhoods. In contrast, the proportion of students reporting high quality of relationships with peers was relatively consistent. The decline in the proportion of students reporting a high quality relationship with parents, schools, and neighbours is concerning due to the protective associations between these relationships and many health behaviours. This decline in the quality of relationships with caring adults at home, school, and in the community comes during a time when youth have become increasingly immersed in a digital world – a world in which they report connecting with friends more frequently through electronic means than in face-to-face interactions (Kowalski et al., 2012).

### Trends in Relationships Quality and Health Behaviours

The results indicate that different relationships matter for different health behaviours. All types of relationships provided unique value for children and youth in their health behaviours. Parent and peer relationships were particularly important for emotional health and for aspects of aggression. Parent relationships were also protective for substance use. School relationships were protective for emotional health, substance use, and sexual behaviours. Neighbourhood relationships were particularly important for a healthy lifestyle and emotional health. Taken together, these findings suggest that with more healthy relationships in their lives, children and youths have more opportunities for positive health behaviours.

The results indicated that health behaviours were consistently related to the quality of relationships **in which children and youth are growing up. For all three cycles, the quality of youths' relationships** with their parents was protective for 11 of 16 health behaviours, peer relationships were protective for 6, school relationships were protective for 6, and neighbourhood relationships were protective for 5 of the 16 health behaviours. These findings illustrate that parent-child relationships are the most **important relationships linked to youths' health behaviours. The relationships beyond the family also** have a significant link to many critical health behaviours including healthy lifestyles, emotional health, aggressive relationships, substance use, and sexual activity.

Table 3. Summary of Results for 2002, 2006, and 2010 HBSC Data

Behaviours	Relationships											
	Parent			Peer			School			Neighbourhood		
	'02	'06	'10	'02	'06	'10	'02	'06	'10	'02	'06	'10
<b>PHYSICAL HEALTH</b>												
Injuries	Y	Y	Y	Y	N	Y	N	N	N	N	Y	Y
Overall Health	N	N	Y	Y	Y	Y	N	N	N	Y	Y	Y
Overweight/obese (BMI)	N	N	N	Y	N	Y	Y	N	N	N	Y	N
<b>HEALTHY LIFESTYLE</b>												
Healthy Eating	N	Y	Y	N	N	Y	N	N	Y	Y	Y	Y
Physically Active	N	N	Y	Y	Y	Y	Y	N	N	Y	Y	Y
<b>EMOTIONAL HEALTH</b>												
Quality of Life	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Psychosomatic Symptoms	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y
Mental Health	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
<b>AGGRESSION</b>												
Bullying	Y	Y	Y	N	Y	Y	Y	Y	N	N	N	N
Victimization	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N
Fighting	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	N
<b>SUBSTANCE USE</b>												
Smoking	Y	Y	Y	Y	Y	N	Y	Y	Y	N	N	N
Drinking Alcohol	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Cannabis Use	Y	Y	Y	N	Y	Y	Y	Y	N	N	Y	N
Hard Drug Use	Y	Y	Y	N	Y	N	Y	Y	N	N	N	N
<b>RISKY BEHAVIOUR</b>												
Sexual Activity	Y	N	Y	Y	Y	N	Y	Y	Y	N	N	N

Y=significant, N=not significant, NA=not available

Green highlights = significant trends in all three data cycles

Orange highlights = trends but in negative direction, for males but not females

Red highlights = no trend across three data cycles

Yellow highlights = significant results but not a trend

## Limitations

**There are strengths and limitations to these data from the World Health Organization's Health Behaviours in School-aged Children Survey.** Data for this survey are collected from a representative sample of youth from 43 countries approximately every three years. Although the surveys from a cycle are built on the cycles before, there is some variability in the health behaviours and associated variables that are measured and some variability in the precise wording of the questions. As indicated in Table 2, only 16 of the 24 variables measured in 2010 were available for all three cycles for the trends analyses. Finally, without data on ethnicity in 2006, we have not been able to study the patterns across specific groups of interest, such as Aboriginal youth. There are also differences in sample size across the three cycles and the surveys have been administered at different times of the year.

The HBSC data are not longitudinal, which prevents a consideration of continuity and change for youth in their development over time and in the quality of their relationships and how relationships in early adolescence shape development over time. One challenge with these cross-sectional data is that it is difficult to interpret anomalies that do not fit the trend. For example, youth in 2006 tended to rate the quality of their peer and school relationships lower than the youth in 2002 and 2010. This unusual pattern in 2006 may simply be an anomaly or there may have been some historic event **or pervasive attitude in the country that shifted youths' perceptions of relationships to being less positive.**

There are also advantages to these cross-sectional data. The HBSC cross-sectional data provide the opportunity to consider trends in health behaviours and relationships across the three cycles. These data enabled us to consider how 11, 13, and 15 years in 2002, 2006, and 2010 responded to the parent, peer, school, and neighbourhood relationship questions over time and whether the quality of these relationships had changed over the eight-year period. We could also examine how youth in the different cycles answered the health questions and whether there were improvements or decrements in health behaviours for children in these age groups.

**An obvious limitation to these HBSC data is that they comprise adolescents' self-reports.** Youth may under or over-report their health problems, depending on their sensitivities and attitudes. Nevertheless, youth are likely the only ones who have an accurate knowledge of their health behaviours; therefore, relying on their reports may be the most reliable method of obtaining these important data. **The youths' reports of their relationships provide only one perspective,** with the potential for youths to over or underreport the quality of their relationships with parents, peers, school, and neighbourhoods. It is impossible to ascertain whether a positive or negative interaction around the time of the survey had any influence on their responses, but these possibilities must be kept in mind. Nevertheless, as with other self-report data, **the "noise" in the responses may average out to provide a relatively valid measure of any construct, at least when data from hundreds of students are aggregated.**



## Implications: Healthy Relationships: A Public Health Issue

The objective in writing this report was to examine the trends in the links between children and youths' **healthy relationships and healthy behaviours based on analyses of the HBSC data from 2002, 2006, and 2010**. We have focused on the quality of relationships because positive relationships provide children and youth with the opportunity to develop emotional and behavioural regulation, critical relationship skills, and capacities in many other domains of development (Calkins & Keene, 2009). When children and youth do not have the advantage of growing up in caring, supportive, predictable, and positive relationships, they experience stressors, which undermine their physical, mental, and social health and development (Calkins & Keene, 2009). This report builds upon an earlier literature review entitled: *Healthy Behaviours Depend on Healthy Relationships* (Pepler et al., 2012), which identified the importance of healthy relationships in the lives of children and youth. This report extends that study by demonstrating that the healthy development of children and youth is consistently linked to the quality of relationships they have within their families, peer groups, schools, and neighbourhoods. Promoting healthy relationships for children and youth needs to be recognized as a public health priority.

The challenge for Canada is that fewer youth in 2010 were experiencing high quality relationships with their parents, schools, and neighbourhoods. It follows, therefore, that fewer students may experience the health benefits linked to positive relationships. One strategy to promote children and youths' **healthy development** is to focus on improving the quality of all these important relationships and the practices of all adults involved in their lives. Adults are responsible for promoting healthy relationships in the lives of children and youth (National Scientific Council on the Developing Child, 2004). **This involves being attuned to the child, to the child's needs, and being appropriately responsive, positive, and supportive.** Essentially, promoting child and youth health and well-being will be accomplished when our practices and policies are child centered and child friendly, with a focus on optimizing the development and well being of all children and youth.

The discussion of implications of the observed trends and associations has been organized under four potential strategies: education and training, assessment and evaluation, prevention and intervention, and policy.

### *Education and Training*

1. There is a need for public education about why healthy relationships are important for healthy development and how to develop and maintain healthy relationships. These messages need to reach all adults involved with children and youth, especially parents, but also teachers, coaches, recreation leaders, and volunteers. Key messages include: the basic human need for love, belonging, and acceptance; reinforcing their role in supervising and guiding children; sharing values, supporting positive problem solving, and making healthy choices; the importance of communication, intimacy, role modelling, guidance and problem solving. It needs to be stressed that the importance of parenting does not end in the early or middle

childhood years. Parents are critical **in shaping adolescents' physical health, mental health, experiences of aggressive relationships, and substance use.**

2. It is important to reverse the trend for a decrease in the proportion of youth experiencing high **quality relationships. Adults in youths' lives require education to engage in, role model, and coach children and youth in the social-emotional skills required for healthy relationships.** Thus, **across Canada's diverse health behaviour and awareness initiatives and public education, it** may be important to include a healthy relationship component.
3. All adults working with children can benefit from education about the importance of their relationships with children and youth during pre-service training and ongoing professional development. With such training, adults can establish high quality relationships with the children and youth in their care and create socialization opportunities that promote healthy development.
4. There has been a decrease in the proportion of students who report having healthy relationships with their schools – by reversing this trend, schools will be able to increase their potential protective **role in promoting students' health behaviours. Educators, themselves,** may need education, strategies, and support for their important role in developing healthy relationships with students. This type of training could be integrated into pre-service education courses offered at universities, as well as ongoing professional development. It is important to recognize that all adults within the school require this type of relationship training because students interact with all types of school personnel such as administrators, bus drivers, and support staff. Therefore, healthy relationship training needs to be available to all school staff and may need to be ongoing to ensure consistently positive relationships for all students at schools, especially those who are struggling at the margins because of academic or social-emotional difficulties. This training needs to be developmentally tailored for the different school levels.

#### *Assessment and Evaluation*

1. The HBSC data were important in revealing the critical links between health behaviours and **the quality of Canadian youths' relationships with their parents, peers, school, and neighbourhood.** A pan-Canadian, standardized assessment of the quality of these relationships is as important as the educational assessments (i.e., PISA scores for the OECD) because of their importance to so many health behaviours.
2. **An ongoing process of monitoring children and youths' relationship quality will alert us to** whether the trend for a decreasing proportion of youths reporting positive relationships with parents, schools, and neighbourhoods continues. It will also provide evidence that programs targeting healthy relationships are having their intended effects.

### *Prevention and Intervention*

1. Programs and services need to promote the capacities of children and the adults who care for them to experience healthy relationships to promote healthy development. Different levels of programming and services focused on relationships are required: universal programming for a foundation of social-emotional learning and healthy relationships, selected programming for those who may lack the support for social-emotional development (e.g., families living in poverty, immigrant and refugee families), and more intense targeted interventions for vulnerable populations and communities (e.g., families with mental health problems). These varying levels of interventions are designed to provide the supports to enable the socializing adults, such as parents and teachers, to engage children and youth in healthy relationships to promote healthy development. The prevention and intervention strategies might be enhanced by a review of existing programs, with a view of integrating healthy relationship training into all the programs and services being delivered. In this way, it would not be necessary to develop a new set of programs and services, but rather it would be possible to add a relationships component to supplement successful initiatives that are currently being conducted with a focus on health, healthy lifestyles, emotional health, violence, and risky behaviours. Programming could complement existing initiatives such as the Canada Prenatal Nutrition Program, Community Action Program for Children, and Aboriginal Head Start in Urban and Northern Communities.
2. Because parents are important across so many health behaviours, a focus on engaging and supporting parents should be integrated into the range of health promotion efforts focused on children and youth. One way to achieve this prevention and promotion goal might be to develop common, universally available parenting education modules across diverse health topics for sustained prevention and intervention efforts. All parents need to know about their **critical role in promoting their children's health** and well being. This education needs to begin in the prenatal period and continue through early childhood, middle childhood and adolescence. For selected programming, there is a need to develop a comprehensive monitoring system to identify and support parents who are struggling with the complex task of **promoting their children's developing relationship capacity, competence, and skills**. For tertiary programming, we have to create systemic mechanisms to support families and communities where parents may not have the experiences or resources to sustain positive parent-child relationships and where other relationships are strained. An example of this level of support is the Canadian Red Cross program for Aboriginal communities – Walking the Prevention Circle (which is described on the PHAC Canadian Best Practices Portal, Violence Prevention Stream).

Parents may need educational support to adapt to the increasing role of technology in their **children's lives. Children and youth learn the technology faster than** the adults in their lives and are more competent at using technology. At this point, electronic media comprise the means through which youth are most likely to communicate; therefore, social media may have the capacity to play a pivotal role in effective parenting. If parents are able to engage with social media, they will have more opportunities to maintain positive relationships with their children.

3. **Peers are also important for youths' healthy lifestyles, physical and mental health, bullying and victimization.** Peer relationships were consistently related to mental health across the three cycles. It is important, therefore, to engage peers in promoting mental health and identifying their friends who might be struggling. Therefore, programs and practices should include youth engagement strategies in this area. From 2002 to 2010, the links between the quality of peer relationships and health behaviours became more numerous in physical health behaviours (injury, overall, obesity, physical activity, healthy eating), as well as in experiences of aggressive relationships (bullying). There is, however, a concern about peer relationships because reports of high quality in peer relationships were related to increased alcohol use, which was a trend over time. It is important to take account not only that youth have high quality relationships with friends, but also who those friends are and whether their influences are positive or negative.
4. Initiatives that promote school connectedness, especially for those students who are marginalized and not well connected, need to be a central focus of a school health strategy. **Schools serve as society's agent of socialization for children and youth and play an important** role not only in their academic education, but also in their healthy lifestyles. The Pan-Canadian Joint Consortium for School Health Schools is dedicated to promoting the health of students by supporting the collaboration between the education and health systems and could play an important role in encouraging school connectedness. Evidence from these HBSC analyses **indicate that schools can play an important role in students' mental health and risk-taking behaviour (i.e., fighting, smoking, and alcohol). Students' school relationship quality was** measured by their perceptions of: belonging in school, rules being fair, and school as a nice place to be.

#### *Policy*

1. There is a need to review, reinforce, and continue researching the critical role of relationships in the healthy development of children and youth. It is important to recognize that it is not always possible for all relationships to be of high quality and, therefore, it is incumbent on society to provide opportunities for children to develop the skills, understanding, capacities, and attitudes for a healthy life and healthy relationships. Effective health promotion, prevention and targeted intervention efforts are required to support the healthy development of children who are disadvantaged and lack healthy relationships. By establishing opportunities

for positive relationship experiences, children with negative relationship experiences can develop in a healthy way into adolescence, setting the stage for good health throughout the lifespan.

2. **Given the importance of relationships for children's healthy development**, it is important to consider the built environment as it shapes social relationships for children and youth. The trends analyses highlight the importance of creating opportunities for children and youth, especially those whose family relationships are not positive, to build healthy relationships with caring adults in their communities.
3. **Efforts to increase social control and cohesion within neighbourhoods may promote youths' mental health** (Xue et al., 2005). As well, a measure of social control and cohesion within communities may serve as metric for an assessment of the impact of new housing projects or **community developments on children's relationships and healthy development**. Further research is needed to understand the inverse relationship between neighbourhood **relationships and youths' health behaviours: youths who report being well connected to their neighbourhood had consistently higher alcohol consumption**. From 2002 to 2010, neighbourhoods became increasingly important in the lives of youth, with stronger links to **youths' reports of injuries, overall health, healthy eating physical activity, quality of life, and mental health**. **Students' school relationship quality was measured by their perceptions of:** having neighbours talk to them, being able to ask neighbours for help, and few people likely to take advantage of them.
4. **Future research on technology and its impact on youths' relationships and health is needed**. Technology has become a significant factor in the lives of youth and the dramatic move that **youth have made into a digital world be may be linked to the increasing importance of youths' relationships with their parents**. The combination of a decrease in the proportion of youth experiencing high quality relationships and an increase in the number of health behaviours linked to parent relationships may be explained, in part, by cultural or attitudinal shifts in the nature of relationships and/or by the increasing use of technology. The challenge for parents in the ever-increasing technical world is to stay connected with their children and youth in positive ways. Although the HBSC survey does not provide data on the nature of the parent-child relationship, **it may be that parents' enhanced ability to connect with their children and youth through technology is facilitating their role in promoting positive health**. Parents who are able to maintain close relationships through this explosion of social media may be those who **are able to promote their children's positive health behaviours**. Social media and technology may be effective when integrated into prevention and intervention strategies to enhance the quality of parent-child relationships.

Through technology, the potential presence of peers in an adolescent's life has extended to 24 hours per day, seven days per week. Although technology has increased peers' exposure markedly over recent years, the link between the quality of peer relationships and health

behaviours has remained relatively consistent. Given the significance of technology in youths' lives, there is potential to use technology to enhance youths' positive relationships with peers and reduce youths' risky relationships. If we are able to promote healthy connections and communications among peers, then there may be even greater potential to promote their positive influences in each other's lives.

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## Appendix 1

### Factor Analyses and Reliabilities of the Relationship Scales

The following tables provide the psychometric data on the robustness of the scales used in the analyses for this report. These data indicate the extent to which the items are consistent in measuring a single construct. A alpha above .60 is generally considered acceptable for reliability of a scale.

#### *Parent Relationship: Factor Loadings and Reliability Alpha*

<b>Factor Items</b>	<b>2002</b>	<b>2006</b>	<b>2010</b>
My parents understand me	0.795	0.802	.758
My parents expect too much of me (reversed)	0.699	0.706	.736
My parents trust me	0.769	0.783	.735
I have a lot of arguments with my parents (reversed)	0.769	0.774	.731
I disobey my parents	NA	NA	.603
Have your parents treated you fairly (reversed)	NA	NA	.600
RELIABILITY ALPHA COEFFICIENT	0.75	0.76	0.78

*Peers Relationship: Factor Loadings and Reliability Alpha*

<b>Factor Items</b>	<b>2002</b>	<b>2006</b>	<b>2010</b>
The students in my class enjoy being together	0.761	0.796	.830
Most of the students in my class are kind and helpful	0.843	0.845	.805
Other students accept me as I am	0.754	0.779	.723
When a student in my class is feeling down, someone else in class tries to help	0.723	NA	.709
The students in my class treat each other with respect	NA	NA	.704
RELIABILITY ALPHA COEFFICIENT	0.77	0.73	0.82

*School Relationship: Factor Loadings and Reliability Alpha*

<b>Factor Items</b>	<b>2002</b>	<b>2006</b>	<b>2010</b>
The rules in this school are fair	0.745	0.730	.882
Our school is a nice place to be	0.883	0.861	.834
I feel I belong at this school	0.837	0.823	.762
RELIABILITY ALPHA COEFFICIENT	0.76	0.73	0.77

*Neighbourhood Relationship: Factor Loadings and Reliability Alpha*

<b>Factor Items</b>	<b>2002</b>	<b>2006</b>	<b>2010</b>
People say 'hello' and often stop to talk to each other in the street	0.754	0.700	.813
You can trust people around here	0.816	0.818	.776
I could ask for help or a favour from neighbours	0.802	0.773	.698
Most people around here would try to take advantage of you if they got the chance (reversed)	0.459	0.485	.402
RELIABILITY ALPHA COEFFICIENT	0.67	0.64	0.61

## Appendix 2

### Summaries of the 2002, 2006, and 2010 analyses

#### *2002 HBSC Results Injuries*

The quality of relationships with parents was more strongly associated with injury among males than females. 56% of males and 48% of females who had negative relationships with their peers reported physical injuries requiring hospitalization. In contrast, 64% of males and 52% of females with positive relationships with their peers reported being injured in the past 12 months. The quality of relationships with peers was more likely to be associated with males being injured than females. In addition, the quality of relationship with school and neighbourhood was more likely to be associated with males being injured than females.

#### *2006 HBSC Results Injuries*

There was a significant association between being injured and the quality of relationships with parents and in the neighbourhood. Having healthier parent relationships was related to fewer injuries, while having healthier neighbourhood relationships was related to more injuries. In 2006, 50% of males and 44% of females who has negative relationships with their parents reported physical injuries requiring hospitalization. In contrast, 41% of males and 31% of females with positive relationships with their parents reported being injured in the past 12 months. In addition, the quality of relationships with parents was more likely to be associated with males being injured than females. See Figure 5. Similarly, 43% of males and 34% of females who has negative relationships in their neighbourhood reported physical injuries requiring hospitalization. In contrast, 50% of males and 39% of females with positive relationships in their neighbourhoods reported being injured in the past 12 months. In addition, the quality of relationships with neighbourhood was more likely to be associated with males being injured than females. The quality of relationship with peers and school in general was more likely to be associated with males being injured than females.

#### *2010 HBSC Results Injuries*

There was a significant association between being injured and the quality of relationships with parents and in the neighbourhood, whereby having healthier relationships were related to fewer injuries. In 2010, 52% of males and 46% of females who had a negative relationship with their parents reported physical injuries requiring hospitalization. In contrast, 44% of males and 36% of females who reported having a positive relationship with their parents reported being injured in the past 12 months. See Figure 5. **The quality of students' relationships with their parents and the risk** for injury was more strongly related for males than females. Similarly, having positive relationships in the neighbourhood reduces the likelihood of experiencing an injury in the past 12 months for both males and females. The quality of the relationships in the neighbourhood was more likely to increase the risk for injury for males compared to females. In addition, for females, but not males, having positive relationships at school was related to fewer injuries.

#### *2002 HBSC Results for Overweight/Obesity*

There was a significant association between being overweight or obese and the quality of relationships with peers and school, and neighbourhood. Positive relationship quality with peers and

in school was related to decreased likelihood of being overweight or obese, while having positive relationships with neighbourhood was related to increased likelihood of being overweight or obese. In 2002, 14% of males and 10% of females who had negative relationships with their peers reported being overweight or obese. In contrast 12% of males and 9% of females who had positive relationships with their peers reported being overweight or obese. The quality of relationships with peers was more associated with males being overweight or obese than females. Similarly, 14% of males and 10% of females who had negative relationship with their school reported being overweight or obese. In contrast 11% of males and 9% of females who had positive relationship with their schools reported being overweight or obese. The quality of relationships with school was more associated with males being overweight or obese than females. Finally, 11% of males and 9% of females who had negative relationships with their neighbourhood reported being overweight or obese. In contrast 13% of males and 11% of females who had positive relationships with their neighbourhood reported being overweight or obese. The quality of neighbourhood relationships was more likely to be associated with males being overweight or obese than females. In addition, the quality of relationships with parents was more likely to be associated with males being overweight or obese than females.

#### *2006 HBSC Results for Overweight/Obesity*

There was a significant association between being overweight or obese and the quality of neighbourhood relationships, whereby having positive relationships was related to decreased likelihood of being overweight or obese. In 2006, 18% of males and 10% of females with negative relationships with their neighbourhood reported being overweight or obese. In contrast, 14% of males and 9% of females who had positive relationships with their neighbourhood reported being overweight or obese. The quality of neighbourhood relationships was more likely to be associated with males being overweight than females. In addition there was a significant interaction with neighbourhood relationships and gender whereby low quality neighbourhood for males increases the likelihood of having a higher BMI more drastically than in females. The quality of relationships with parents, peers, and school was more likely to be associated with males being overweight or obese than females.

#### *2010 HBSC Results for Overweight/Obesity*

There was a significant association between being overweight or obese and the quality of relationships with peers, whereby having positive relationships was related to decreased likelihood of being overweight or obese. In 2010, 15% of males and 12% of females who had a negative relationship with their peers were overweight or obese. In contrast, 13% of males and 11% of females who reported having a positive relationship with their peers were overweight or obese. In general, the quality of all relationships was more strongly related to the risk of being overweight or obese for males than females.

#### *2002 HBSC Results Overall Health*

There was a significant association between positive overall health and the quality of relationships with peers and neighbourhood, whereby having more positive relationships was related to increased likelihood of good or excellent health. In 2002, 87% of males and 81% of females who had negative

relationships with their peers reported having good or excellent health. In contrast, 90% of males and 86% of females who had positive relationships with their peers reported having good or excellent health. See Figure 6. The effect of quality of peer relationship on overall health was greater for males than females. Furthermore, 87% of males and 81% of females who had negative relationships with their neighbourhood reported having good or excellent health. In contrast 89% of males and 86% of females who had positive relationships with their neighbourhood had good or excellent health. See Figure 7. The effect of quality of neighbourhood relationship on overall health was greater for males than females.. The effect of quality of parent and school relationships on overall health was greater for males than females.

#### *2006 HBSC Results Overall Health*

There was a significant association between positive overall health and the quality of relationships with peers and neighbourhood, whereby having more positive relationships was related to increased likelihood of good or excellent health. In 2006, 83% of males and 78% of females who had negative relationships with their peers reported having good or excellent health. In contrast, 88% of males and 88% of females who had negative relationships with their peers reported having good or excellent health. The effect of quality of peer relationship on overall health was greater for males than females. 84% of males and 78% of females who had negative relationships with their neighbourhood reported having good or excellent health. In contrast 87% of males and 86% of females who had positive relationships with their neighbourhood had good or excellent health. The effect of quality of neighbourhood relationship on overall health was greater for males than females. There was also a significant interaction effect of quality of relationship with neighbourhood and gender whereby the effect is linear for females but not males. Finally, there was a significant interaction with quality of parent and school relationships and gender, similar to the neighbourhood relationship. The effect of quality of parent and school relationships on overall health was greater for males than females.

#### *2010 HBSC Results Overall Health*

There was a significant association between positive overall health and the quality of relationships with parents and peers, whereby having healthier relationships was related to increased likelihood of good or excellent health. In 2010, 85% of males and 76% of females who had a negative relationship with their parents reported having good or excellent health. In contrast, 89% of males and 86% of females who reported having a positive relationship with their parents had good or excellent health. The effect of quality of parent relationship on overall health was greater for females than males. Furthermore, 83% of males and 78% of females who had a negative relationship with their peers reported having good or excellent health. In contrast, 87% of males and 84% of females who reported having a positive relationship with their peers reported having good or excellent health. The overall effect of the quality of relationship with peers was greater for males than females on general health. There were significant interactions between gender and both school and neighbourhood relationships. Poor relationships with peers and neighbourhood were more likely to be associated with poor health for females than for males.

#### *2002 HBSC Results for Healthy Eating*

There was a significant association between healthy eating and the quality of neighbourhood relationships, whereby having healthier neighbourhood relationships was related to increased likelihood of good or excellent eating. In 2002, 30% of males and 27% of females who had negative relationships with the neighbourhood reported healthy eating. In contrast, 39% of males and 36% of females who reported having positive relationships with the neighbourhood reported having healthy eating. The effect of all relationships on healthy eating was stronger for males than females. See Figure 8.

#### *2006 HBSC Results for Healthy Eating*

There was a significant association between healthy eating and the quality of parent and neighbourhood relationships, whereby having more positive parent and neighbourhood relationship was related to increased likelihood of good or excellent eating. In 2006, 30% of males and 28% of females with negative relationships with their parents reported healthy eating. In contrast 34% of males and 33% of females with positive relationships with their parents reported healthy eating. Similarly, 26% of males and 27% of females with negative relationships with the neighbourhood reported healthy eating. In contrast, 35% of males and 36% of females with positive relationships with the neighbourhood reported healthy eating. See Figure 8.

#### *2010 HBSC Results for Healthy Eating*

There was a significant association between healthy eating and the quality of all the tested relationships, whereby having healthier relationships was related to increased likelihood of healthy eating. In 2010, 35% of males and 42% of females who had a positive relationship with their parents reported healthy eating. In contrast, 28% of males and 34% of females who reported having a negative relationship with their parents reported healthy eating. The effect of parent relationship on healthy eating was stronger for females than males. 33% of males and 40% of females who had a positive relationship with their peers reported healthy eating. In contrast, 30% of males and 35% of females who reported having a negative relationship with their peers reported having healthy eating. The quality of relationships with peers was more likely to be associated with healthy eating for females than for males. 33% of males and 40% of females who had a positive relationship with their school reported healthy eating. In contrast, 30% of males and 35% of females who reported having a negative relationship with their school reported having healthy eating. The quality of relationships with school was more strongly associated with healthy eating for females than for males. Finally, 36% of males and 43% of females who had positive relationships within their neighbourhood reported healthy eating, while 28% of males and 32% of females who reported having a negative relationship with their neighbourhood reported having healthy eating. The quality of relationships with neighbourhood was more strongly associated with healthy eating for females than for males. See Figure 8.

#### *2002 HBSC Results for Physical Activity*

There was a significant association between being physically active and the quality of relationships with peers, school, and neighbourhood. Healthier relationships with peers and neighbourhood were related to being highly physically active. Healthier relationships with school were related to being less physically active. In 2002, 38% of males and 23% of females who had negative relationships



with their peers reported being physically active. In contrast, 47% of males and 31% of females who had positive relationships with peer reported being physically active. The effect of peer relationships on physical activity was stronger for males than females. See Figure 9. Similarly, 44% of males and 26% of females who had negative relationships with school reported being physically active. In contrast, 38% of males and 26% of females with positive relationships with school reported being physically active. There was a significant interaction effect of quality of relationship with school and gender, whereby the effect of school relationships was more linear for females compared to males. Additionally, the effect of school relationships on physical activity was stronger for females than males. Finally, 38% of males and 22% of females who had negative relationships with the neighbourhood reported being physically active. In contrast 46% of males and 31% of females who had positive relationships with the neighbourhood reported being physically active. The effect of neighbourhood relationships on physical activity was stronger for males than females. See Figure 10. The effect of parent relationships on being physically active was also stronger for males than females.

#### *2006 HBSC Results for Physical Activity*

There was a significant association between being physically active and the quality of relationships with peers and neighbourhood, whereby healthier relationships were related to being more physically active. (See Figures 9 and 10). Figure 9 depicts that 36% of males and 23% of females who had negative relationships with peers reported being physically active. In contrast, 41% of males and 28% of females who had positive relationships with peers reported being physically active. The effect of peer relationships on being physically active was stronger for males than females. Figure 10 depicts that 32% of males and 20% of females who had negative relationships with the neighbourhood reported being physically active. In contrast, 46% of males and 30% of females who had positive relationships with the neighbourhood reported being physically active. There was a significant interaction effect of quality of relationship with neighbourhood and gender, whereby the effect was more linear for females than males. The effect of neighbourhood relationships on being physically active was also stronger for males than females.

#### *2010 HBSC Results for Physical Activity*

There was a significant association between being physically active and the quality of relationships with parent, peer, and neighbourhood, whereby having healthier relationships was related to being more physically active. Figure 9 shows that 41% of males and 31% of females who had a positive relationship with their parents reported being physically active. 41% of males and 26% of females who reported having a negative relationship with their parents also reported being physically active. There was a significant interaction effect of quality of relationship with parents and gender. For females, as the quality of relationship decreased a lower percentage of females were physically active. This was not true for males. Furthermore, 43% of males and 32% of females who had a positive relationship with their peers reported being physically active. In contrast, 37% of males and 26% of females who reported having a negative relationship with their peers reported being physically active. The quality peer relationships was more likely to be associated with being physically active for males than for females. Figure 10 depicts the results for physical activity and quality of neighbourhood relationships. 48% of males and 38% of females who had positive

relationships within their neighbourhood reported being physically active. In contrast, 34% of males and 23% of females who reported having a negative relationship with their neighbourhood reported being physically active. The quality of relationships with neighbourhood was more strongly associated with being physically active for males than for females. There was a significant interaction between relationship with school and gender. The proportion of females who were physically active was greater in the high quality school relationship group than in the low and medium quality school relationship groups.

#### *2002 HBSC Results for Quality of Life*

There was a significant association between quality of life and the quality of all tested relationships, whereby having healthier relationships was related to increased likelihood of good or high quality of life. See Figures 11, 12, 13, and 14. Figure 11 depicts that 26% of males and 16% of females who had negative relationships with their parents reported a high quality of life. In contrast 47% of males and 47% of females who had positive relationships with parents reported having a high quality of life. The effect of parent relationship on quality of life was stronger for females than males. There was also a significant interaction effect of quality of relationship with parent and gender whereby the effect was steeper for females compared to males. 31% of males and 29% of females who had negative relationships with their peers reported a high quality of life. In contrast, 38% of males and 36% of females who had positive relationships with their peers reported a high quality of life. The effect of peer relationship on quality of life was stronger for males than females. 32% of males and 28% of females who had negative relationships with their school reported a high quality of life. In contrast, 37% of males and 33% of females who had positive relationships with their school reported a high quality of life. The effect of school relationships on quality of life was stronger for males than females. 32% of males and 28% of females who had negative relationships with their neighbourhood reported a high quality of life. In contrast, 37% of males and 33% of females who had positive relationships with their neighbourhood reported a high quality of life. The effect of school relationships on quality of life was stronger for males than females.

#### *2006 HBSC Results for Quality of Life*

There was a significant association between quality of life and the quality of all the tested relationships, whereby having healthier relationships was related to increased likelihood of good or high quality of life. Figure 11 depicts that 19% of males and 16% of females who had negative relationships with their parents reported a high quality of life. In contrast 43% of males and 43% of females who had positive relationships with parents reported having a high quality of life. The effect of parent relationship on quality of life was stronger for males than females. Figure 12 depicts that 24% of males and 25% of females who had negative relationships with their peers reported a high quality of life. In contrast, 33% of males and 34% of females who had positive relationships with their peers reported a high quality of life. There was also a significant interaction effect of quality of relationship with peers and gender, whereby the effect was more linear for males compared to females. Figure 13 depicts that 27% of males and 25% of females with negative school relationships reported a high quality of life. In contrast 32% of males and 32% of females with

positive school relationships reported a high quality of life. Figure 14 depicts that 24% of males and 25% of females who had negative neighbourhood relationships reported a high quality of life. In contrast, 34% of males and 33% of females with positive neighbourhood relationships reported a high quality of life.

#### *2010 HBSC Results for Quality of Life*

There was a significant association between quality of life and the quality of all the tested relationships, whereby having healthier relationships was related to increased likelihood of good or high quality of life. See Figures 11, 12, 13, and 14. Figure 11 shows that 43% of males and 41% of females who had a positive relationship with their parents reported a good or high quality of life. In contrast, 22% of males and 17% of females who reported having a negative relationship with their parents reported having a good or high quality of life. The effect of parent relationship was stronger for males than females for high quality of life. Figure 12 depicts the results for quality of life and the quality of relationships with peers. 34% of males and 32% of females who had a positive relationship with their peers reported a good or high quality of life. In contrast, 27% of males and 24% of females who reported having a negative relationship with their peers reported having a good or high quality of life. The quality of relationships with peers was more likely to be associated with quality of life for males than for females. Figure 13 depicts the results for quality of life and quality of relationship with school. 32% of males and 30% of females who had a positive relationship with their school reported a good or high quality of life. In contrast, 28% of males and 24% of females who reported having a negative relationship with their school reported having a good or high quality of life. The quality of relationships with school was more strongly associated for males than for females. Figure 14 depicts the results for quality of life and quality of neighbourhood relationships. 34% of males and 32% of females who had positive relationships within their neighbourhood reported having a good or high quality of life. In contrast, 27% of males and 24% of females who reported having a negative relationship with their neighbourhood reported having a good or high quality of life. The quality of relationships with neighbourhood was more strongly associated with quality of life for males than for females.

#### *2002 HBSC Results for Psychosomatic Symptoms*

There was a significant relationship between psychosomatic symptoms and the quality of parent, peer, and school relationships, whereby having healthier relationships was related to having fewer psychosomatic symptoms. Figure 15 depicts that 26% of males and 15% of females who had negative relationships with their parents reported few psychosomatic symptoms. In contrast, 42% of males and 31% of females who had positive relationships with their parents reported few psychosomatic symptoms. The quality of parent relationships was more strongly associated with few psychosomatic symptoms for males than females. Figure 16 depicts that 30% of males and 22% of females who had negative relationships with their peers reported few psychosomatic symptoms. In contrast 37% of males and 26% of females who had positive relationships with their peers reported few psychosomatic symptoms. The quality of peer relationships was more strongly associated with few psychosomatic symptoms for males than females. Furthermore, 30% of males and 22% of females who had negative relationships with their school reported few psychosomatic symptoms. In contrast 37% of males and 26% of females who had positive relationships with their school reported

few psychosomatic symptoms. The quality of school and neighbourhood relationships was more strongly associated with few psychosomatic symptoms for males than females.

#### *2006 HBSC Results for Psychosomatic Symptoms*

There was a significant relationship between psychosomatic symptoms and the quality of parent and peer relationships, whereby having healthier relationships was related to having fewer psychosomatic symptoms. See Figures 15 and 16. Figure 15 depicts that 23% of males and 12% of females who had negative relationships with their parents reported few psychosomatic symptoms. In contrast 40% of males and 29% of females who had positive relationships with their parents reported having few psychosomatic symptoms. The quality of parent relationships was more strongly associated with few psychosomatic symptoms for males than females. Figure 16 depicts that 29% of males and 19% of females who had negative relationships with their peers reported few psychosomatic symptoms. In contrast 31% of males and 24% of females who had positive relationships with their peers reported few psychosomatic symptoms. The quality of peer relationships was more strongly associated with few psychosomatic symptoms for males than females. There was also a significant interaction effect of quality of relationships with peers and gender, whereby the trend was more linear for females. The quality of school and neighbourhood relationships was more strongly associated with few psychosomatic symptoms for males than females.

#### *2010 HBSC Results for Psychosomatic Symptoms*

There was a significant relationship between psychosomatic symptoms and the quality of parent, peer, school, and neighbourhood relationships, whereby having healthier relationships was related to having fewer psychosomatic symptoms. Figure 15 depicts that 41% of males and 28% of females who had a positive relationship with their parents reported few psychosomatic symptoms. In contrast, 25% of males and 14% of females who reported having a negative relationship with their parents reported having few psychosomatic symptoms. The effect of parent relationship on having psychosomatic was stronger for males than females. Figure 16 depicts the results for having few psychosomatic symptoms and the quality of relationships with peers. 33% of males and 21% of females who had a positive relationship with their peers reported few psychosomatic symptoms. In contrast, 31% of males and 20% of females who reported having a negative relationship with their peers reported few psychosomatic symptoms. The quality of peer relationships with peers was more likely to be associated with having few psychosomatic symptoms for males than for females. 33% of males and 22% of females who had a positive relationship with their school reported having few psychosomatic symptoms. In contrast, 31% of males and 20% of females who reported having a negative relationship with their school reported having few psychosomatic symptoms. The quality of relationships with school was more strongly associated with having few psychosomatic symptoms for males than for females. 34% of males and 20% of females who had positive relationships within their neighbourhood reported having few psychosomatic symptoms. In contrast, 30% of males and 21% of females who reported having a negative relationship with their neighbourhood reported having few psychosomatic symptoms. The quality of relationships with neighbourhood was more strongly associated with having few psychosomatic symptoms for males than for females. Finally,

the quality of relationships with school was more strongly associated with having few psychosomatic symptoms for males than for females.

#### *2002 HBSC Results for Mental Health*

There was a significant association between mental health and all tested relationships, whereby high quality relationships were related to increased likelihood of mental health. (See Figures 17, 18, 19, and 20). Figure 17 depicts that 28% of males and 16% of females who had a negative relationship with their parents reported high mental health. In contrast 69% of males and 62% of females who had positive relationships with their parents reported high mental health. There was also a significant interaction effect between quality of relationship with parent and gender. The quality of relationships with parents was more strongly associated with mental health for males than for females. Figure 18 depicts that 40% of males and 31% of females who had a negative relationship with their peers reported high mental health. In contrast, 57% of males and 46% of females who had positive relationships with their peers reported high mental health. The quality of relationships with peers was more strongly associated with mental health for males than for females. Figure 19 depicts that 44% of males and 33% of females with negative school relationships report high mental health. In contrast 47% of males and 38% of females with positive school relationships reported high mental health. The quality of relationship with school was more strongly associated with mental health for males than for females. Figure 20 depicts that 38% of males and 33% of females with negative neighbourhood relationships report high mental health. In contrast 52% of males and 39% of females with positive neighbourhood relationships report high mental health. There was also a significant interaction effect between quality of relationship with neighbourhood and gender. The quality of relationships with the neighbourhood was more strongly associated with mental health for males than for females.

### *2006 HBSC Results for Mental Health*

There was a significant association between mental health and all tested relationships, whereby high quality relationships were related to increased likelihood of mental health. Figure 17 depicts that 20% of males and 11% of females who had a negative relationship with their parents reported high mental health. In contrast 68% of males and 52% of females who had positive relationships with their parents reported high mental health. There was also a significant interaction effect between quality of relationship with parent and gender, whereby having a good relationship with parent was most beneficial to males. The quality of relationships with parents was more strongly associated with mental health for males than for females. Figure 18 depicts that 33% of males and 26% of females who had a negative relationship with their peers reported high mental health. In contrast, 49% of males and 34% of females who had positive relationships with their peers reported high mental health. There was also a significant interaction effect between quality of relationship with peers and gender whereby high quality peer relationships were most beneficial to males. The quality of relationships with peers was more strongly associated with mental health for males than for females. Figure 19 depicts that 36% of males and 28% of females with negative school relationships report high mental health. In contrast 42% of males and 31% of females with positive school relationships reported high mental health. The quality of relationship with school was more strongly associated with mental health for males than for females. Figure 20 depicts that 33% of males and 26% of females with negative neighbourhood relationships report high mental health. In contrast 43% of males and 31% of females with positive neighbourhood relationships report high mental health. The quality of relationships with the neighbourhood was more strongly associated with mental health for males than for females.

### *2010 HBSC Results for Mental Health*

There was a significant association between mental health and all tested relationships, whereby high quality relationships were related to increased likelihood of mental health. Figure 17 depicts that 46% of males and 37% of females who had a high quality relationship with their parents reported high mental health. In contrast, 19% of males and 14% of females who reported having a negative relationship with their parents reported having high mental health. There was a significant interaction between quality of relationship with parents and gender, such that the effect of parent relationship quality at all levels more protective for females than males on mental health. Figure 18 depicts the results for mental health and the quality of relationships with peers. 38% of males and 29% of females who had a positive relationship with their peers reported high mental health. In contrast, 26% of males and 19% of females who reported having a negative relationship with their peers reported having high mental health. The quality of relationships with peers was more likely to be associated with mental health for males than for females. Figure 19 depicts the results for mental health and quality of relationship with school. 32% of males and 24% of females who had a positive relationship with their school reported high mental health. In contrast, 29% of males and 22% of females who reported having a negative relationship with their school reported having high mental health. The quality of relationships with school was more strongly associated with mental health for males than for females. Figure 20 depicts the results for mental health and quality of neighbourhood relationships. 38% of males and 27% of females who had positive relationships within their

neighbourhood reported high mental health. In contrast, 25% of males and 19% of females who reported having a negative relationship with their neighbourhood reported having high mental health. The quality of relationships with neighbourhood was more strongly associated with mental health for males than for females.

#### *2002 HBSC Results for Bullying*

There was a significant association between bullying others and the quality of relationships with parents and school, whereby low quality relationships were related to increased likelihood of bullying others. Figure 21 depicts that 53% of males and 45% of females who had low quality relationships with parents reported bullying others. In contrast 43% of males and 30% of females who had high quality relationships with parents reported bullying others. The effect of parent relationship on bullying others was stronger for males than females. 53% of males and 40% of females who had low quality relationships with school reported bullying others. In contrast 44% of males and 33% of females who had high quality relationships with school reported bullying others. The effect of school and peer relationships on bullying was stronger for males than females.

#### *2006 HBSC Results for Bullying*

There was a significant association between bullying others and the quality of relationships with parents, peer, and school, whereby low quality relationships were related to increased likelihood of bullying others. Figure 21 depicts that 50% of males and 45% of females who had low quality relationships with parents reported bullying others. In contrast 32% of males and 25% of females who had high quality relationships with parents reported bullying others. The effect of parent relationships on bullying was stronger for males than females. 45% of males and 38% of females who had low quality relationships with peers reported bullying others. In contrast 39% of males and 32% of females who had high quality relationships with peers reported bullying others. The effect of peer relationships on bullying was stronger for males than females. 45% of males and 35% of females who had low quality relationships with school reported bullying others. In contrast, 40% of males and 32% of females who had high quality relationships with school reported bullying others. The effect of school and neighbourhood relationship quality on bullying was stronger for males than females.

#### *2010 HBSC Results for Bullying*

There was a significant association between bullying others and the quality of relationships with parents and peers, whereby low quality relationships with parents and peers were related to increased likelihood of bullying others. Figure 21 depicts that 62% of males and 62% females who had a low quality relationship with their parents reported bullying others. In contrast, 44% of males and 38% of females who reported having a positive relationship with their parents reported having bullied others. There was a significant interaction between quality of relationship with parents and gender, such that the effect of medium and positive relationship quality was stronger for protecting females than males on bullying others. Finally, the effect of parent relationship was stronger for females than males on bullying others. In 2010, 58% of males and 54% of females who had a low quality relationship with their peers reported bullying others. In contrast, 55% of males and 49% of females who reported having a positive relationship with their peers reported having bullied others.

The effect of peer relationships was stronger for females than males on bullying others. The effect of neighbourhood relationships was stronger for females than for males. The likelihood of bullying for males was about equal across the quality of neighbourhood relationship groups.

#### *2002 HBSC Results for Victimization*

There was a significant association between being victimized and the quality relationships with parents and peers, whereby high quality relationships with parents and peers were related to decreased likelihood of being victimized. In 2002, Figure 22 depicts 43% of males and 42% of females who had a low quality relationship with their parents reported being victimized. In contrast, 33% of males and 34% of females who reported having a positive relationship with their parents reported being victimized. Figure 23 depicts 46% of males and 44% of females who had a low quality relationship with their peers reported being victimized. In contrast, 30% of males and 33% of females who reported having a positive relationship with their peers reported being victimized. There was no significant association between being victimized and quality of relationships with school or neighbourhood.

#### *2006 HBSC Results for Victimization*

There was a significant association between being victimized and the quality relationships with parents and peers, whereby high quality relationships with parents and peers were related to decreased likelihood of being victimized (See Figures 22 and 23). In 2006, Figure 22 depicts 41% of males and 42% of females who had a low quality relationship with their parents reported being victimized. In contrast, 27% of males and 29% of females who reported having a positive relationship with their parents reported being victimized. There was a significant interaction between relationship with parents and gender of the child, whereby the effect was more linear for females. Figure 23 depicts 46% of males and 45% of females who had a low quality relationship with their peers reported being victimized. In contrast, 27% of males and 27% of females who reported having a positive relationship with their peers reported being victimized.

#### *2010 HBSC Results for Victimization*

There was a significant association between being victimized and the quality relationships with parents, peers, and school whereby high quality relationships with parents, peers, and school were related to decreased likelihood of being victimized. In 2010, Figure 22 depicts 65% of males and 76% of females who had a low quality relationship with their parents reported being victimized. In contrast, 51% of males and 59% of females who reported having a positive relationship with their parents reported being victimized. The effect of the quality of parent relationship on the risk for being victimized was stronger for females than males. Figure 23 shows 65% of males and 74% of females who had a low quality relationship with their peers reported being victimized. In contrast, 54% of males and 63% of females who reported having a positive relationship with their peers reported being victimized. The effect of peer relationship on the risk for being victimized was stronger for females than males. The association between quality of relationship with schools and **victimization was as predicted, whereby students' reports of low quality relationships with school** were associated with increased risk for being victimized. In addition, the effects of school and



neighbourhood relationships on risk of being victimized were stronger for females compared to males.

#### *2002 HBSC Results for Fighting*

There was a significant association between fighting and the quality of parent, peer, school, and neighbourhood relationships, whereby having healthier relationships was related to decreased likelihood of fighting (See Figures 24 and 25). Figure 24 depicts that 42% of males and 18% of females who had a positive relationship with their parents reported fighting. In contrast, 53% of males and 35% of females who reported having a negative relationship with their parents reported fighting. In general, the effect of quality of parent relationships on fighting was stronger for males than females. There was an interaction effect of parent relationship quality and gender on fighting whereby the effect was stronger for females. 46% of males and 23% of females who reported a low quality relationship with peers reported fighting. In contrast, 51% of males and 26% of females who reported a high quality relationship with peers reported fighting. In general, this effect was stronger for males than females. Figure 25 depicts the results for fighting and quality of relationship with school. 46% of males and 21% of females who had a negative relationship with their school reported fighting. In contrast, 53% of males and 30% of females who reported having a positive relationship with their school reported fighting. In general the effect of quality of school relationship on fighting was stronger for males than females. This was also true for the quality of relationships with peers. 48% of males and 23% of females who reported a low quality relationship with their neighbourhood reported fighting. In contrast, 51% of males and 23% of females who reported a high quality relationship with their neighbourhood reported fighting. This effect was generally stronger for males than females. There was an interaction effect of neighbourhood relationship quality and gender on fighting whereby the effect was at all levels for males, but not for females.

#### *2006 HBSC Results for Fighting*

There was a significant association between fighting and the quality of parent and school relationships, whereby having healthier relationships was related to decreased likelihood of fighting. See Figures 24 and 25. Figure 24 depicts that 45% of males and 21% of females who had a positive relationship with their parents reported fighting. In contrast, 60% of males and 40% of females with a negative relationship with their parents reported fighting. Figure 25 depicts the results for fighting and quality of relationship with school. 52% of males and 28% of females who had a positive relationship with their school reported fighting. In contrast, 60% of males and 33% of females who reported having a negative relationship with their school reported fighting. The effect of the quality on parent, peer, school, and neighbourhood relationships on physical fighting was significantly higher for males than females.

#### *2010 HBSC Results for Fighting*

There was a significant association between fighting and the quality of parent and school relationships, whereby having healthier relationships was related to decreased likelihood of fighting (See Figures 24 and 25). Figure 24 shows that 43% of males and 16% of females who had a positive relationship with their parents reported fighting. In contrast, 55% of males and 32% of

females with a negative relationship with their parents reported fighting. There was an interaction effect of parent relationship quality and gender on fighting whereby the effect was stronger for females compared to males. Figure 25 depicts the results for fighting and quality of relationship with school. 49% of males and 21% of females who had a positive relationship with their school reported fighting. In contrast, 52% of males and 27% of females who reported having a negative relationship with their school reported fighting. In general the effect of quality of school and peer relationship was stronger for males than females. Finally, there was a significant interaction between the quality of relationship with the neighbourhood and gender. For females, as the quality of relationship decreased, there was an increase in the prevalence of fighting; this pattern was not observed among males.

#### *2002 HBSC Results for Smoking Tobacco*

There was a significant association between smoking and the quality of parent, peer, and school relationships, whereby having healthier relationships was related to decreased likelihood of smoking. See Figures 26 and 27. Figure 26 depicts that 25% of males and 23% of females who had a positive relationship with their parents reported smoking. In contrast, 35% of males and 39% of females who reported having a negative relationship with their parents reported smoking. 34% of males and 31% of females who had a positive relationship with peers reported smoking. In contrast, 28% of males and 26% of females who had a negative relationship with peers reported smoking. Figure 27 depicts the results for smoking and quality of relationship with school. 25% of males and 23% of females who had a positive relationship with their school reported smoking. In contrast, 35% of males and 34% of females who reported having a negative relationship with their school reported smoking.

#### *2006 HBSC Results for Smoking Tobacco*

There was a significant association between smoking and the quality of parent, peer, and school relationships, whereby having healthier relationships was related to decreased likelihood of smoking. Figure 26 depicts that 19% of males and 21% of females who had a positive relationship with their parents reported smoking. In contrast, 28% of males and 34% of females who reported having a negative relationship with their parents smoked. The effect of the quality of parent relationships on smoking tobacco was significantly higher for females than males, with more females smoking than males. 25% of males and 26% of females who reported a positive relationship with peers reported smoking. In contrast, 21% of males and 27% of females with a negative relationship with peers reported smoking. There was a significant interaction between quality of peer relationship and gender, with a more linear relationship found for males. Figure 27 depicts the results for smoking and quality of relationship with school. 20% of males and 20% of females who had a positive relationship with their school reported smoking. In contrast, 28% of males and 33% of females who reported having a negative relationship with their school smoked. There was a significant interaction between school relationship quality and gender; females in particular were adversely affected by a poor school relationship. Significant interactions were also found with gender and relationship with both peers and neighbourhood. For peer relationships among males, as quality of relationship increased there was an increase in the percentage who reported smoking.

### *2010 HBSC Results for Smoking Tobacco*

There was a significant association between smoking and the quality of parent and school relationships, whereby having healthier relationships was related to decreased likelihood of smoking. Figure 26 demonstrates that 11% of males and 12% of females who had a positive relationship with their parents reported smoking. In contrast, 19% of males and 24% of females who reported having a negative relationship with their parents smoked. There was a significant interaction between quality of parent relationship and gender, whereby the effect of parent relationship was greater for females. Figure 27 shows the results for smoking and quality of relationship with school. 16% of males and 15% of females who had a positive relationship with their school reported smoking. In contrast, 17% of males and 19% of females with a negative relationship with their school reported smoking. There was also a significant interaction between school relationship quality and gender, such that for females there was a difference in the proportion who smoked from high quality to low and medium quality relationships. In contrast, males in high quality and low quality relationships reported smoking more frequently than males with medium quality school relationships. There were also significant interactions for relationship with peers and neighbourhood with gender.

### *2002 HBSC Results for Drinking Alcohol*

There was a significant association between consuming alcohol and the quality of parents, peers, school, and neighbourhood relationships. (See Figures 28, 29, 30, and 31). Figure 28 shows that 52% of males and 42% of females who had a positive relationship with their parents reported drinking alcohol. In contrast, 62% of males and 64% of females who reported having a negative relationship with their parents reported drinking alcohol. In general, the effect of quality of parent relationships on drinking alcohol was stronger for males than females. An interaction was observed wherein the gradient is much steeper among females. Figure 29 depicts the results for drinking alcohol and the quality of relationships with peers. 63% of males and 52% of females who had a positive relationship with their peers reported drinking alcohol. In contrast, 54% of males and 49% of females who reported having a negative relationship with their peers reported drinking alcohol. The quality of relationships with peers was more likely to be associated with drinking for males than for females. Figure 30 depicts the results for drinking alcohol and quality of relationship with school, where 51% of males and 43% of females who had a positive relationship with their school reported drinking alcohol. In contrast, 66% of males and 59% of females who reported having a negative relationship with their school reported drinking. In general, the effect of the quality of school relationships on drinking alcohol was stronger for males than females. Figure 31 depicts the results for drinking alcohol and quality of neighbourhood relationships, where 60% of males and 51% of females who had positive relationships within their neighbourhood reported drinking alcohol. In contrast, 53% of males and 49% of females who reported having a negative relationship with their neighbourhood reported drinking alcohol. The effect was in the opposite direction than what was expected and the negative trend was present for males not females. The quality of neighbourhood relationships with peers was more likely to be associated with drinking for males than for females.

### *2006 HBSC Results for Drinking Alcohol*

There was a significant association between consuming alcohol and the quality of parents, peers, school, and neighbourhood relationships. See Figures 28, 29, 30, and 31. Figure 28 shows that 52% of males and 48% of females who had a positive relationship with their parents reported drinking alcohol. In contrast, 62% of males and 66% of females who reported having a negative relationship with their parents reported drinking alcohol. There was a significant interaction effect with a steeper gradient observed in females. Figure 29 depicts the results for drinking alcohol and the quality of relationships with peers. 61% of males and 57% of females who had a positive relationship with their peers reported drinking alcohol. In contrast, 55% of males and 58% of females who reported having a negative relationship with their peers reported drinking alcohol. There was a significant interaction effect; males were more likely to drink alcohol as peer relationships improved, while **females' tendency to drink alcohol decreased very slightly as peer relationships improved**. Figure 30 depicts the results for drinking alcohol and quality of relationship with school; as neighbourhood relationship improved alcohol consumption increased among both males and females. 52% of males and 52% of females who had a positive relationship with their school reported drinking alcohol. In contrast, 64% of males and 61% of females who reported having a negative relationship with their school reported drinking. Figure 31 depicts the results for drinking alcohol and quality of neighbourhood relationships. 62% of males and 58% of females who had positive relationships within their neighbourhood reported drinking alcohol. In contrast, 53% of males and 56% of females who reported having a negative relationship with their neighbourhood reported drinking alcohol. The effect was in the opposite direction than what was expected.

#### *2010 HBSC Results for Drinking Alcohol*

There was a significant association between consuming alcohol and the quality of parents, peers, school, and neighbourhood relationships. (See Figures 28, 29, 30, and 31). Figure 28 shows that 39% of males and 33% of females who had a positive relationship with their parents reported drinking alcohol. In contrast, 48% of males and 54% of females who reported having a negative relationship with their parents reported drinking alcohol. There was a significant interaction whereby the effect of quality of relationships with parents on drinking was stronger for females than males. Figure 29 depicts the results for drinking alcohol and the quality of relationships with peers. 47% of males and 44% of females who had a positive relationship with their peers reported drinking alcohol. In contrast, 42% of males and 43% of females who reported having a negative relationship with their peers reported drinking alcohol. This effect was in the opposite direction than expected. The quality of peer relationships was more likely to be associated with drinking for males than for females. Figure 30 depicts the results for drinking alcohol and quality of relationship with school. 43% of males and 38% of females who had a positive relationship with their school reported drinking alcohol. In contrast, 47% of males and 47% of females who reported having a negative relationship with their school reported drinking. In addition, there was a significant interaction effect whereby the effect of quality of relationships with schools on drinking was stronger for females than males. Figure 31 depicts the results for drinking alcohol and quality of neighbourhood relationships. 48% of males and 44% of females who had positive relationships within their neighbourhood reported drinking alcohol. In contrast, 41% of males and 43% of females who reported having a negative relationship with their neighbourhood reported drinking alcohol. The effect was in the

opposite direction than expected. There was a significant interaction effect whereby the effect of quality of relationships with schools on drinking was stronger for males and non-significant for females.

#### *2002 HBSC Results for Smoking Cannabis*

There was a significant association between using cannabis and the quality relationships with parents and school, whereby high quality relationships were related to decreased likelihood of using cannabis (See Figure 32). Figure 32 depicts that 25% of males and 23% of females who had a high quality relationship with their parents reported using cannabis. In contrast, 45% of males and 39% of females who reported having a low quality of relationship with their parents reported using cannabis. The effect of parent and peer relationships on cannabis use was stronger for males than females. 44% of males and 36% of females who had a low quality relationship with their schools reported using cannabis. In contrast, 31% of males and 24% of females who reported having a positive relationship with their schools reported using cannabis. The effect of school relationship on the risk for using cannabis was stronger for males than females. For school and neighbourhood relationships, there was a main effect of gender that demonstrated the quality of relationship was more likely to be significantly associated for males than females for cannabis use.

#### *2006 HBSC Results for Smoking Cannabis*

There was a significant association between using cannabis and the quality relationships with parent and neighbourhoods, whereby high quality relationships were related to decreased likelihood of using cannabis. See Figures 32, 33, 34, 35, and 36. Figure 32 shows that 20% of males and 19% of females who had a high quality relationship with their parents reported using cannabis. In contrast, 35% of males and 35% of females who reported having a low quality of relationship with their parents reported using cannabis. 36% of males and 33% of females who had a low quality relationship with their schools reported using cannabis. In contrast, 23% of males and 23% of females who reported having a positive relationship with their schools reported using cannabis. 24% of males and 28% of females who had a low quality relationship with their peers reported using cannabis. In contrast, 32% of males and 30% of females who reported having highly positive relationship with their peers reported using cannabis. 24% of males and 30% of females who reported a low quality relationship with their neighbourhoods reported smoking cannabis. In contrast, 29% of males and 25% of females who reported a high quality relationship with their neighbourhood reported smoking cannabis. For neighbourhood relationships, there was a significant interaction wherein cannabis use decreased as relationship quality increased for females but not males.

#### *2010 HBSC Results for Smoking Cannabis*

There was a significant association between using cannabis and the quality relationships with parents and peers, whereby high quality relationships were related to decreased likelihood of using cannabis. Figure 32 shows that 17% of males and 15% of females who had a high quality relationship with their parents reported using cannabis. In contrast, 33% of males and 33% of females who reported having a low quality of relationship with their parents reported using cannabis. The effect of parent relationship on cannabis use was stronger for females than males. 26% of

males and 24% of females who had a low quality relationship with their peers reported using cannabis. In contrast, 27% of males and 26% of females who reported having highly positive relationship with their peers reported using cannabis. The effect of peer relationships was stronger for males than females on cannabis use.

#### *2002 HBSC Results for Hard Drug Use*

There was a significant association between using hard drugs and the quality relationships with parents whereby high quality relationships were related to decreased likelihood of using hard drugs. Figure 33 shows that 38% of males and 30% of females who had a low quality relationship with their parents reported using hard drugs. In contrast, 23% of males and 23% of females who reported having a high quality of relationship with their parents reported using hard drugs. 38% of males and 30% of females who had a low quality school relationship reported using hard drugs. In contrast, 27% of males and 24% of females who reported having a high quality school relationship reported using hard drugs. For peer, school, and neighbourhood relationships, there was a main effect of gender that demonstrated the quality of relationship was more likely to be significantly associated for males than females for hard drug use.

#### *2006 HBSC Results for Hard Drug Use*

There was a significant association between using hard drugs and the quality of relationships with parents, peers, and school, whereby high quality relationships were related to decreased likelihood of using hard drugs. Figure 33 shows that 19% of males and 24% of females who had a low quality relationship with their parents reported using hard drugs. In contrast, 12% of males and 13% of females who reported having a high quality relationship with their parents reported using hard drugs. The effect of the quality of relationship with parents was stronger for females than males. 13% of males and 20% of females who had a low quality relationship with their peers reported using hard drugs. In contrast, 21% of males and 17% of females who reported having a high quality relationship with their peers reported using hard drugs. There was a significant interaction between relationship with peers and gender; a linear relationship was observed for males but not for females. 20% of males and 23% of females who reported a low quality school relationship reported using hard drugs. In contrast, 13% of males and 13% of females who reported having a high quality school relationship reported using hard drugs.

#### *2010 HBSC Results for Hard Drug Use*

There was a significant association between using hard drugs and the quality relationships with parents only, whereby high quality relationships were related to decreased likelihood of using hard drugs. Figure 33 shows that 14% of males and 17% of females who had a low quality relationship with their parents reported using hard drugs. In contrast, 8% of males and 9% of females who reported having a high quality of relationship with their parents reported using hard drugs.

#### *2002 HBSC Results for Sexual Activity*

There was a significant association between engaging in sexual activity and the quality of relationships with parents, peers, and schools, whereby high quality relationships with parents and schools were related to decreased likelihood of having had sex. 27% of males and 28% of females who had a low quality relationship with their parents reported having had sex. In contrast, 17% of

males and 14% of females who reported having a high quality of relationship with their parents reported having sex. 29% of males and 18% of females who had a low quality relationship with their peers reported having sex. In contrast, 31% of males and 24% of females who reported having a positive relationship with their peers reported having sex. There was a significant interaction between relationship level with peers and sex, whereby the association was linear for females but not for males. Figure 34 depicts the results for having sex and quality of relationship with school. 30% of males and 23.1% of females who had a negative relationship with their school reported having had sex. In contrast, 16% of males and 17% of females who reported having a positive relationship with their school reported having had sex.

#### *2006 HBSC Results for Sexual Activity*

There was a significant association between engaging in sexual activity and the quality of relationships with peers and school, whereby high quality relationships with peers were related to increased likelihood of having had sex, and high quality relationships with school were related to decreased likelihood of having sex. 19% of males and 24% of females who had a low quality relationship with their peers reported having sex. In contrast, 29% of males and 24% of females who reported having a positive relationship with their peers reported having sex. This finding was in the opposite of the expected direction. Figure 34 depicts the results for having sex and quality of relationship with school. 26% of males and 30% of females who had a negative relationship with their school reported having had sex. In contrast, 21% of males and 18% of females who reported having a positive relationship with their school reported having had sex.

#### *2010 HBSC Results for Sexual Activity*

There was a significant association between engaging in sexual activity and the quality of relationships with parents and schools, whereby high quality relationships with parents and schools were related to decreased likelihood of having had sex. In contrast, 23% of males and 19% of females who reported having a high quality of relationship with their parents reported having sex. Figure 34 depicts the results for having sex and quality of relationship with school. 29% of males and 29% of females who had a negative relationship with their school reported having had sex. In contrast, 27% of males and 23% of females who reported having a positive relationship with their school reported having had sex. The quality of relationships with school was more strongly associated with having sex for males than for females. For peer relationships, the quality of relationships with peers, in general had a stronger association for males than for females.