



# Physical Activity and Healthy Eating Among Children and Youth

Key Findings from the 2009-2010 Study

June 2012

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# Background and Context

This summary presents key findings from the Keeping Pace surveillance study, carried out in 2009-2010. The purpose of the Keeping Pace surveillance study is to monitor provincial and regional trends in the physical activity and body mass index (BMI) of students in grades 3, 7, 11 and dietary intake and behaviour of students in grades 7 and 11 in Nova Scotia. It has been carried out every four years, with the first study taking place in 2001-2002 (formerly titled *Physical Activity Levels and Dietary Intake of Children and Youth in Nova Scotia*).

Physical activity and dietary intake are both important determinants of child growth and development. They can also influence adult health behaviours and patterns. The Keeping Pace study provides access to this important information for a variety of stakeholders, including schools, municipalities, health promotion programs, and the provincial government. For example, the most recent data has informed the development of a provincial childhood obesity prevention strategy for Nova Scotia. Data collected and analysed as part of Keeping Pace also provide stakeholders with guidance on program direction to improve physical activity levels and dietary intake for children and youth. This project was funded by the Department of Health and Wellness and the Department of Education.

# Participants

Students from randomly selected schools in Nova Scotia were invited to participate in the Keeping Pace study with the intent of recruiting 60 boys and 60 girls from each of grades 3, 7, and 11 from across the province. One-thousand-eight-hundred and fifty-five (1,855) students volunteered to participate in this study.

# Methodology

The Keeping Pace study used six different data collection methods:

- Actigraph GT1M accelerometers were used to provide an objective measure of physical activity for the children and youth. Participants were instructed to wear the accelerometer during all waking hours, with the exception of showering or other water-based activities (swimming, water sports, etc.) for seven consecutive days. An accelerometer non-use log was used to record physical activities in which children and youth participated without wearing the accelerometer.
- Participating students in grades 7 and 11 completed the online Food Behaviour Questionnaire (FBQ) which includes a 24-hour recall, food frequency questionnaire and questions about factors that influence dietary intake.
- Height, weight, and waist circumference of study participants were measured according to the International Society for the Advancement of Kinanthropometry (ISAK) standards. BMI was calculated from the height and weight measurements.
- A self-report questionnaire about physical activity was completed by each student in grades 3, 7 and 11 who volunteered to participate in the study. The questionnaire examined environmental and psychosocial factors that may influence the physical activity attitudes and behaviours of children and youth.
- A parent questionnaire about physical activity was also completed by the parents or guardians of each of the study participants.
- An environmental scan was completed by the data collectors for each school from which participants were selected. The environmental scan gathered information about the school environment, structure of the school day, and other factors thought to affect physical activity and/or dietary intake.

The data were weighted to create provincially representative data. Descriptive, correlational, and comparative analyses of the data were then carried out.

# FINDINGS: Physical Activity

In total, 1,855 participants in grades 3, 7, and 11 provided data on physical activity as part of Keeping Pace.

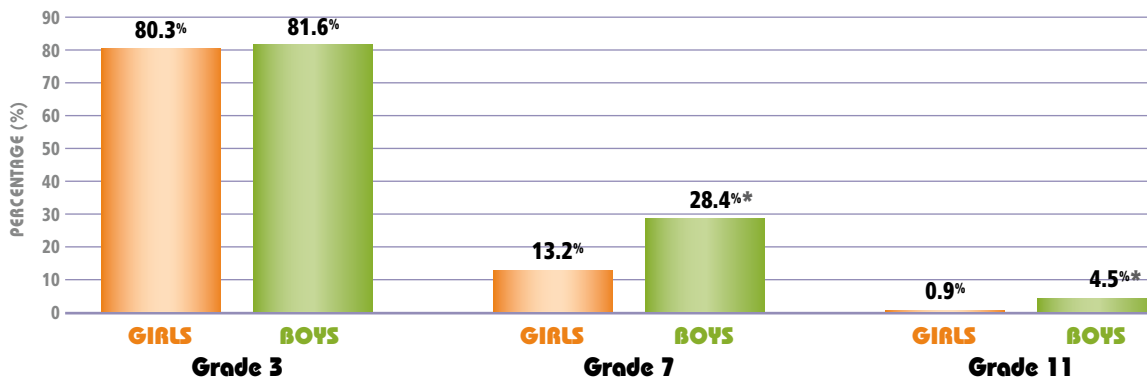
## Sample for the Keeping Pace study in Nova Scotia from which BMI and physical activity data were collected

Grade 3		Grade 7		Grade 11	
Boys	Girls	Boys	Girls	Boys	Girls
328	417	286	417	165	242
<b>Total: 1855</b>					

## PHYSICAL ACTIVITY STANDARD

The standard for physical activity for children and youth in this project is that they accumulate a minimum of 60 minutes of physical activity at a moderate or greater intensity level per day, at least 5 days of the week. Although a large proportion of girls and boys in Grade 3 achieve that standard (82% of Grade 3 boys and 80% of Grade 3 girls), the proportion meeting the standard declines sharply in the older grades. Less than a third of boys (28%) and less than a fifth of girls (13%) in Grade 7 met the standard, and by Grade 11, fewer than one in 100 girls (1%) and one in 20 boys (5%) met the standard. Moreover, in Grade 11, 61% of girls and almost two-fifths of boys (38%) did not obtain 60 minutes of physical activity of moderate or greater intensity on any day of the week.

## Percentage of girls and boys in grades 3, 7 and 11 in Nova Scotia that met the physical activity standard on five or more days

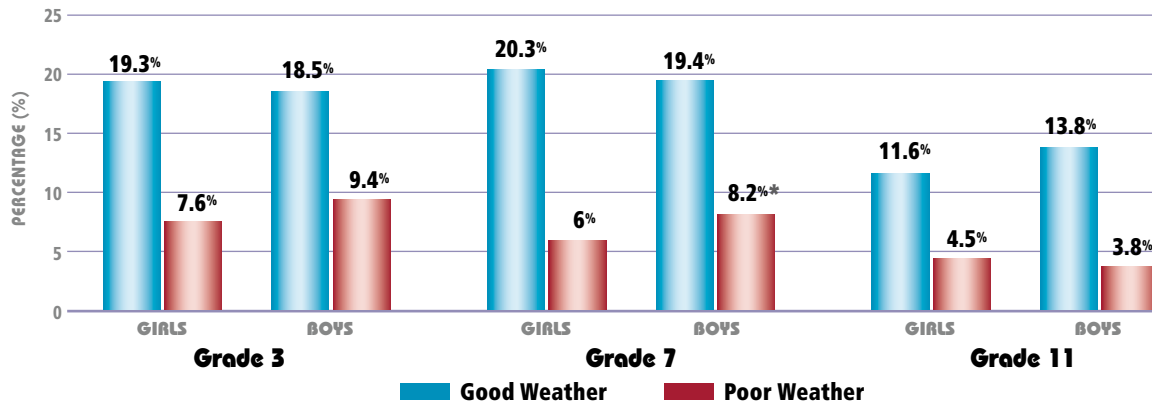


\*Significant difference between boys and girls at  $p < 0.05$ .

## PARTICIPATION IN PHYSICAL ACTIVITY

Parents reported that the majority of children and youth did not use active modes of transportation (walking or biking) to get to school, even in good weather. Only about 20% of boys and girls in grades 3 and 7 reported walking to school in good weather. In Grade 11, fewer students walked to school (14% of boys and 12% of girls) in good weather. In poor weather, fewer than 10% of Grade 3 and Grade 7 boys and girls, and fewer than 5% of boys and girls in Grade 11 walked to school.

### Percentage of girls and boys in grade 3, 7 and 11 in Nova Scotia who walked to school during good and poor weather



\*Significant difference between boys and girls at  $p < 0.05$ .

Approximately 50% to 60% of boys and girls in grades 3, 7, and 11 (ranging from a low of 48% of girls in Grade 11 to a high of 60% of boys in Grade 7) indicated that they had an opportunity to participate in an afterschool program that includes physical activity or sports. However, far fewer children and youth actually attended such a program at least 3 days a week (15% of boys and 20% of girls in Grade 3; 35% of boys and 33% of girls in Grade 7; and 46% of boys and 25% of girls in Grade 11).

About two-thirds of children and youth reported participating in sports or other physical activities (either organized or unorganized) before or after school in the week before the survey was conducted. For example, 61% of Grade 11 girls participated in unorganized activities such as roller-blading or jogging; 68% of Grade 7 boys participated in organized sports such as hockey or soccer; 59% of Grade 3 boys participated in unorganized sports such as Frisbee or touch football.

**Percentage of boys and girls in grades 3, 7, and 11 in Nova Scotia who indicated that they participated in organized sports<sup>1</sup>, unorganized Sports<sup>2</sup>, organized activities<sup>3</sup>, and unorganized activities<sup>4</sup> before or after school previous week**

	Grade 3		Grade 7		Grade 11	
	Boys	Girls	Boys	Girls	Boys	Girls
<b>Organized Sports</b>	60%*	46%	68%*	54%	54%*	38%
<b>Unorganized Sports</b>	59%*	42%	61%*	49%	55%*	26%
<b>Organized Activities</b>	28%*	50%	20%*	37%	14%*	21%
<b>Unorganized Activities</b>	48%*	52%	53%*	62%	64%	61%

\*Significant difference between boys and girls at  $p < 0.05$ .

<sup>1</sup> organized sports = sports such as figure skating, gymnastics, hockey, soccer, etc.

<sup>2</sup> unorganized sports = sports such as shooting hoops, Frisbee, flag or touch football, etc.

<sup>3</sup> organized activities = activities such as dance or swimming lessons, etc.

<sup>4</sup> unorganized activities = activities such as roller blading, jogging, etc.

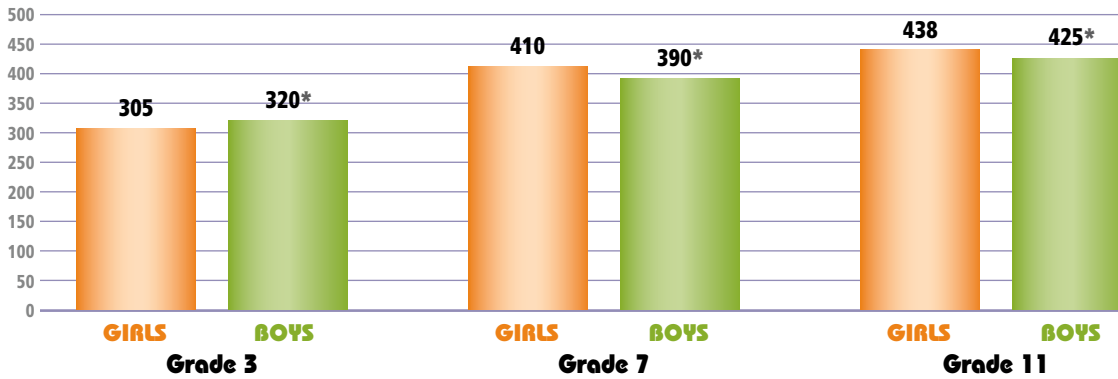
The findings above illustrate that although the majority of children and youth are participating in physical activities, this does not necessarily lead to meeting the standard for physical activity. It could be that the activities in which they participate are not long enough for them to accumulate the recommended 60 minutes, not done frequently enough (less than five times per week), or are not at a high enough level of intensity to meet the standard.

Girls and boys in all three grades did not get a lot of moderate to vigorous physical activity in the afterschool period (3 pm to 6 pm) on average. While children in Grade 3 averaged 39 minutes (for both boys and girls), in the older grades, the averages range between 19 minutes (Grade 7 boys) and 8 minutes (Grade 11 girls). The afterschool period may therefore be an important time period in which activity levels could be increased.

## **SEDENTARY TIME AND SCREEN TIME**

Girls and boys in grades 7 and 11 were sedentary over half of the time they wore the accelerometer as part of this study, with Grade 11 girls having the highest proportion of sedentary time (Grade 7 boys – 54%; Grade 7 girls – 57%; Grade 11 boys – 60%; Grade 11 girls – 64%). Boys and girls in Grade 3 were sedentary less than half of the time measured (Grade 3 boys – 45%; Grade 3 girls – 44%). The total amount of sedentary time increased with the age of the children. Grade 3 boys and girls had between 305 minutes (girls) and 320 minutes (boys) of sedentary activities; in Grade 7 this increased to 390 minutes (boys) to 410 minutes (girls); and in Grade 11, to 425 minutes (boys) to 438 minutes (girls).

**Average daily minutes of sedentary behaviour for seven days among girls and boys in grades 3, 7 and 11 in Nova Scotia**

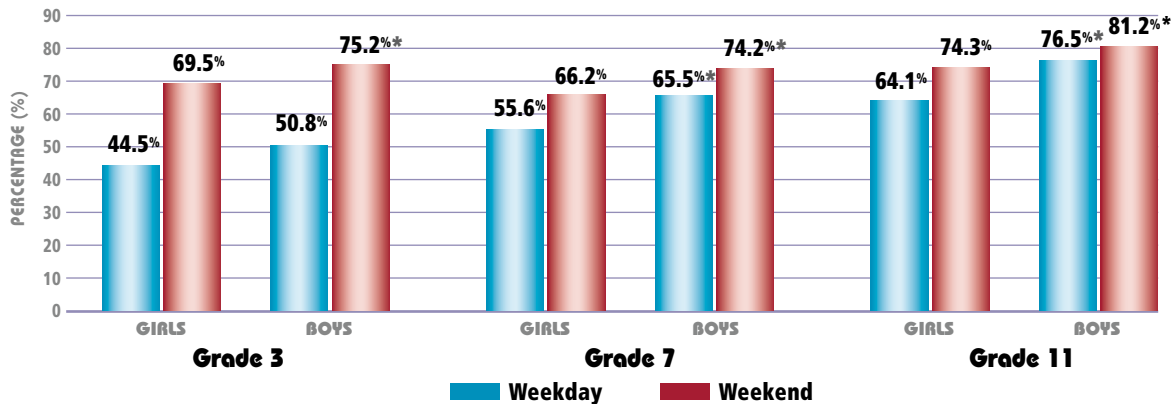


\*Significant difference between boys and girls at  $p < 0.05$ .

Note: Results were rounded up to the nearest whole number.

Sedentary activities includes time spent in front of a screen. High proportions of children and youth at all age levels spent more than two hours per day in front of a screen, e.g. watching TV, playing video games, computer time. This ranged from 45% of girls in Grade 3 to 77% of boys in Grade 11 on weekdays, and from 70% of girls in Grade 3 to 81% of boys in Grade 11 on the weekends. Significantly more girls than boys reported less than two hours of screen time per day (weekdays and weekends) for all grade levels.

**Percentage of girls and boys in grade 3, 7 and 11 in Nova Scotia who reported two hours or more of screen time<sup>1</sup> during the weekday and weekend**



\*Significant difference between boys and girls at  $p < 0.05$ .

<sup>1</sup> Screen time included 'watching TV/videos/DVDs', 'playing computer/video games (portable or console devices; do not include Wii)' and 'surfing the internet for fun.'



## **DIFFERENCES BETWEEN BOYS AND GIRLS**

The data indicate a statistically significant difference in physical activity levels between boys and girls, with poorer results for girls than for boys across a number of areas:

- Significantly fewer girls than boys met the physical activity standard in grades 7 and 11.
- Girls in grades 7 and 11 were sedentary for a significantly longer time (more minutes) than boys.
- Boys obtained significantly more minutes of moderate to vigorous physical activity in the afterschool time period.
- Boys in Grade 11 were significantly more likely to attend an afterschool program that included physical activity than Grade 11 girls.
- Significantly fewer girls than boys in grades 7 and 11 participate in intramural activities/sports.

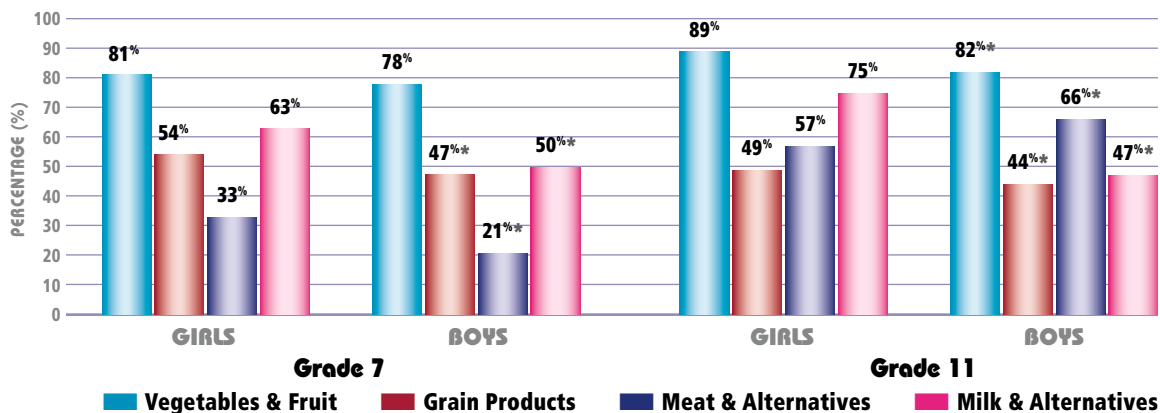
# FINDINGS: Dietary Intake

Students in grades 7 and 11 completed dietary intake questionnaires online. This included a total of 918 students, 611 in Grade 7 and 307 in Grade 11.

## INTAKE OF FOOD AND NUTRIENTS

A majority of youth did not meet the minimum recommended servings from *Eating Well with Canada's Food Guide* for Vegetables and Fruit, Grain Products, and Milk and Alternatives. The proportion that did not meet the minimum servings for Vegetables and Fruit was particularly high, ranging from 78% of Grade 7 boys to 89% of Grade 11 girls. Significantly more girls than boys did not meet the recommended servings across most of the food groups.

**Percentage of girls and boys in grades 7 and 11 in Nova Scotia who do not meet the recommended servings for age and sex from *Eating Well with Canada's Food Guide***



\*Significant difference between boys and girls at  $p < 0.05$ .

Note: Percentages for each category have been rounded to the nearest whole number.

Both boys and girls reported eating foods that were not part of the four food groups. These foods include fats and oils, sugars, candy, tea, coffee, soda, etc. that are energy dense and/or contribute few nutrients to the diet. Youth ate an average of four to six servings of foods that were not part of the four food groups, and boys consumed significantly more in this category than girls. This may be attributed to the fact that boys tend to eat more food than girls due to larger body size and energy needs. It does not necessarily indicate a poorer quality of diet, nor overconsumption among boys.

With the lower intakes of Vegetables and Fruit and Grain Products, it is not surprising that the vast majority of youth did not meet the Dietary Reference Intake (DRI) guidelines for fibre (ranging from 94% for Grade 7 girls, to 96% for Grade 11 boys). A small proportion of youth exceeded the DRI for maximum intake from added sugar (the highest proportion was Grade 11 boys at 17%), but about a third of youth (between 33% and 39%) exceeded the DRI for consumption of total fat. Significantly more boys than girls exceeded the DRI guidelines for both fat and sugar.

A majority of youth exceeded the DRI for sodium intake, between 57% for Grade 11 girls and 75% for Grade 11 boys. Significantly more boys than girls exceeded the recommended intake for sodium, and boys also had a significantly higher mean intake of sodium (between 3,095 mg and 3,838 mg for boys and between 2,567 mg and 2,677 mg for girls). Mean intakes for both boys and girls are above the tolerable upper limit for sodium intake suggested by Health Canada (2,200 mg for youth aged 9-13 and 2,300 mg for youth 14-19<sup>1</sup>).

## INTAKE OF BEVERAGES

Approximately one in five youth in grades 7 and 11 drank pop two to four times per week (ranging from 21% for Grade 7 boys to 23% for Grade 11 boys). Almost one in ten Grade 7 boys (9%) drank pop once a day, compared to one in twenty (5%) for girls in grades 7 and 11 and boys in Grade 11. Significantly more boys than girls reported consuming pop daily, and five to six times per week.

### Frequency of pop consumption: Percentage of boys and girls in grades 7 and 11 in Nova Scotia

Pop consumption	Grade 7		Grade 11	
	Girls	Boys	Girls	Boys
Once/ day	5%	9%*	5%	5%
5 – 6 times/ week	7%	15%*	8%	18%*
2 – 4 times/ week	22%	21%	23%	23%
2 – 4 times/ month	32%	28%	35%	27%
Rarely / Never	35%	27%*	44%	36%

\*Significant difference between boys and girls at  $p < 0.05$ .

Note: Percentages for each category have been rounded to the nearest whole number.

Chocolate milk is consumed on a daily basis by approximately a quarter (24%) of Grade 7 boys and close to 10% of Grade 7 girls and boys and girls in Grade 11. Significantly more girls than boys reported rarely or never consuming pop (35% of Grade 7 girls and 44% of Grade 11 girls versus 27% of Grade 7 boys and 36% of Grade 11 boys) or chocolate milk (24% of Grade 7 girls and 36% of Grade 11 girls versus 22% of Grade 7 boys and 19% of Grade 11 boys).

<sup>1</sup> Health Canada. Food and Nutrition, Dietary Reference Intakes, Reference Values for Elements. [http://www.hc-sc.gc.ca/fn-an/nutrition/reference/table/ref\\_elements\\_tbl-eng.php](http://www.hc-sc.gc.ca/fn-an/nutrition/reference/table/ref_elements_tbl-eng.php).

### Frequency of chocolate milk consumption: Percentage of girls and boys in grades 7 and 11 in Nova Scotia

Frequency of chocolate milk consumption	Grade 7		Grade 11	
	Girls	Boys	Girls	Boys
Once/ day	11%	24%*	11%	7%*
5 – 6 times/ week	13%	13%	7%	18%*
2 – 4 times/ week	25%	20%*	20%	22%
2 – 4 times/ month	28%	21%*	26%	33%*
Rarely / Never	24%	22%	36%	19%*

\*Significant difference between boys and girls at  $p < 0.05$ .

Note: Percentages for each category have been rounded to the nearest whole number.

Before now, there has been little to no data available on the consumption of energy drinks among Nova Scotia children and youth. A small proportion of youth (4% or less) reported drinking energy drinks (i.e. energy shots, beverages, carbonated energy drinks) on a regular basis (5 times a week or more). However, slightly greater proportions, particularly of Grade 11 boys, drink these types of drinks on a semi-regular basis, either two to four times a week or two to four times a month. The highest proportion consuming these drinks is 27% of Grade 11 boys who drink energy drinks two to four times a month and 18% of Grade 11 boys who drink them two to four times per week.

## SCHOOL ENVIRONMENT

The Keeping Pace study collected information about the numbers of and distances to fast food restaurants and convenience stores in and around most schools from which participants for the study were selected. The data presented here are sample data, which was not weighted. These data are therefore not representative of the provincial situation, only the situation in the specific schools sampled.

Results suggest that high schools<sup>2</sup> appeared to have greater access (i.e. higher numbers and closer distances) to fast food restaurants and convenience stores than elementary<sup>3</sup> and junior high<sup>4</sup> schools. Over 50% of high schools had one or more fast food restaurants near the school with an average distance to the restaurant of 1.5 blocks. While fewer elementary and junior high schools were near fast food restaurants (25% and 37% respectively), these restaurants seemed to be slightly closer to school (less than one block away).

The high schools in the sample were also more likely to be near a convenience store (72%) and have more convenience stores nearby (average of two). These findings suggest that students in high schools have greater access to the types of foods available from fast food restaurants and convenience stores located off school grounds.

<sup>2</sup> Grade 11 students are assumed to be at high schools.

<sup>3</sup> Grade 3 students are assumed to be at elementary schools.

<sup>4</sup> Grade 7 students are assumed to be at junior high schools.

## FOOD SECURITY

Girls reported experiencing food insecurity with greater frequency than boys across almost all categories and in both age groups (grades 7 and 11). Food insecurity of varying degrees was reported by between 2% (did not eat for a day because family cannot afford) and 18% (worry that food at home will run out) for girls in Grade 7 and between 4% (skipped a meal because family cannot afford) and 24% (worry that food at home will run out) for girls in Grade 11.

### Percentage of students in grades 7 and 11 in Nova Scotia who reported food insecurity

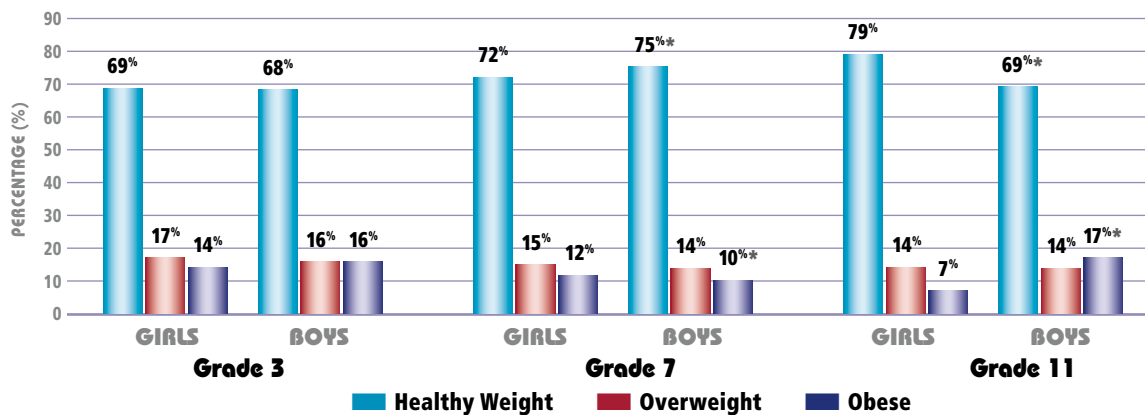
Food Security Determinant		Grade 7		Grade 11	
		Boys	Girls	Boys	Girls
Worry that food at home will run out and can not afford more	A lot	1.2%	1.4%	2.5%*	6%
	Sometimes	12%*	17%	11%*	18%
	Never	86%*	82%	87%*	77%
Food ran out and family could not afford more	A lot	0%*	2%	2%	2%
	Sometimes	8%	7%	8%*	11%
	Never	92%	91%	90%*	87%
Meals include cheap food since family does not have enough money	A lot	0.4%	1%	3%	4%
	Sometimes	13%	15%	8%*	18%
	Never	86%	84%	90%*	78%
Does not eat balanced meals as family cannot afford food	A lot	1%	1%	3%*	7%
	Sometimes	8%	8%	4%*	11%
	Never	91%	91%	93%*	82%
Ate less since family cannot afford food	A lot	0%*	1%	1%*	5%
	Sometimes	5%	6%	3%	4%
	Never	95%	93%	97%*	90%
Eats smaller meals as family cannot afford more food	A lot	1%	1%	0.2%*	3%
	Sometimes	5%	6%	5%*	8%
	Never	95%	93%	95%*	89%
Skipped a meal as family cannot afford more food	A lot	0%	0.2%	0.3%	0.7%
	Sometimes	2%*	3%	1%*	3%
	Never	98%	97%	99%*	96%
Went hungry as family cannot afford food	A lot	0%*	1%	0.2%	0%
	Sometimes	3%*	6%	6%	8%
	Never	97%*	94%	94%	92%
Did not eat for a whole day since family cannot afford food	A lot	0%	0.3%	0%	0%
	Sometimes	2%	2%	0.2%*	5%
	Never	98%	98%	99.8%*	95%

\*Significant difference between boys and girls at  $p < 0.05$ .

# Weight

The data show that although the majority of children and youth are at a healthy weight (ranging from 68% of Grade 3 boys to 79% of Grade 11 girls), up to one in three are overweight or obese (ranging from 21% of Grade 11 girls to 32% of Grade 3 boys).

**Percentage of girls and boys in grades 3, 7 and 11 in Nova Scotia classified<sup>1</sup> as healthy weight<sup>2</sup>, overweight and obese**



\*Significant difference between boys and girls at  $p < 0.05$ .

Note: Percentages for each category have been rounded to the nearest whole number.

<sup>1</sup>Using the CDC BMI-for-age percentiles for boys and girls 2 to 20 years, the following BMI classifications are defined as: Healthy weight = BMI the 5<sup>th</sup> and < 85<sup>th</sup> percentile; Overweight = BMI the 85<sup>th</sup> and < 95<sup>th</sup> percentile; Obese = BMI 95<sup>th</sup> percentile

<sup>2</sup>The category of girls and boys who were classified as underweight was not displayed in the graph due to the percentages for each grade and sex being less than 1%.

# Conclusion

The data from the 2009-2010 Keeping Pace surveillance study will help to monitor provincial and regional trends in physical activity, dietary intake, and BMI for children and youth in Nova Scotia.

It is not possible to make statistical comparison between the data collected in 2009-2010 and data collected in 2005-2006 and 2001-2002 because the methodology regarding the data analysis was changed in 2009-2010 to ensure the results were representative of the Nova Scotia population of boys and girls in each grade. Keeping this in mind, it appears that the percentages of students meeting the physical activity standard of 60 minutes or more of moderate or vigorous physical activity on at least 5 days per week was lower in 2009-2010 for the boys and girls in grades 3 and 7 and relatively stable (i.e., consistently few achieve the standard) in Grade 11.

*Eating Well with Canada's Food Guide* provides guidance on a pattern of eating that meets nutrient needs and contributes to reduced risk of chronic disease development. The results of the 2009-2010 Keeping Pace study indicate that the majority of youth in Nova Scotia do not follow this pattern of eating. Diets appear to be low in vegetables and fruit, grain products, milk and alternatives, and high in sodium. These findings are consistent with data gathered in 2005-2006.

Further analysis of data from the Keeping Pace study will be conducted over time. The key findings highlighted here will be shared with and used by stakeholders such as schools, municipalities, and the provincial government. These data can help to provide direction for programming intended to improve physical activity, reduce sedentary time, and improve dietary intake in children and youth.

## ACKNOWLEDGEMENTS

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For an electronic copy of this document and future productions from the study, visit [www.gov.ns.ca/dhw](http://www.gov.ns.ca/dhw).