



# Kids CAN PLAY!

Encouraging children to be active at home, at school, and in their communities

## How many steps are sufficient for children and youth to be healthy?

The Canadian Fitness and Lifestyle Research Institute's CANPLAY study (Canadian Physical activity Levels Among Youth study) has been used to measure the physical activity levels of children and youth, by using pedometers to measure daily steps. The study has been conducted annually since 2005. Based on data collected in 2011-2014, the CANPLAY study shows that Canadian children and youth (aged 5 to 19) take approximately 11,000 steps per day on average.

Findings from Bulletin 1 in this series described the number of steps taken per day by population groups and as trends over time. As highlights, Bulletin 1 found that boys took more daily steps on average than girls, and average daily steps declined with increasing age. In addition, children who participated in organized physical activities and sport took more daily steps on average than those who did not. The number of daily steps taken also varied by parental and household characteristics. For example, children whose parents held a university education took more steps than children whose parents had a college education. Children whose parents reported being substantially more active than their peers took more daily steps than children whose parents reported being slightly less active. Children from the highest income households took more steps than those from lower income households. When examining trends, results from Bulletin 1 in this series showed that the average steps taken in 2011-2014 were lower than those taken by children in 2005-2007.

The question "how many steps are required to make a child healthy?" is often posed. Currently, there is no specific criterion accepted in the literature that defines the required number of steps, although several have been suggested. For the purpose of this bulletin, four criteria are described. One earlier criterion attempts to categorize a threshold that would represent earlier (before 2011) physical activity guidelines for children and youth. This threshold - achieving 16,500 steps on average - estimated adding roughly 90 minutes of activity to daily life. As the literature regarding objective measures of physical activity (via measurement of steps) and new physical activity guidelines (2011 and onwards) for children and youth have evolved, a newer

criterion has been suggested to estimate guidelines. Based on a Canadian study that assessed physical activity using accelerometers, a threshold of at least 12,000 steps of moderate-to-vigorous intensity activity for 7 days a week has been recommended.<sup>1</sup> Another study has suggested 9,000 steps or more as appropriate for use with pedometers.<sup>2</sup> Although intensity is not assessed using pedometers as a measurement tool in the CANPLAY study, it can be used to assess a rough approximation of the number of steps and days of the week. Findings related to both of these criteria are described in this bulletin. Lastly, a criterion examining a range of step values based on gender and age is also explored in this bulletin.<sup>3</sup>

### Criterion measuring earlier physical activity guidelines – 16,500 steps on average

At baseline (2005-2007), 10% of children and youth in Canada achieved an average of 16,500 steps. This proportion (9%) did not significantly change from 2011-2014. The proportion achieving this criterion in 2011-2014 was lower than that reported in 2007-2009. The proportion achieving this criterion has varied little in each province and territory over the four time periods.

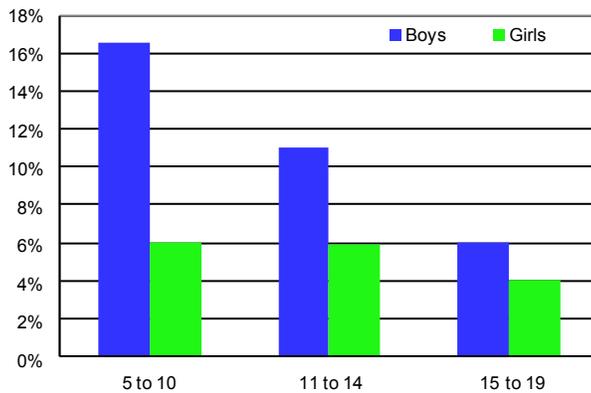
### Child characteristics

In terms of age and gender, the proportion achieving an average of 16,500 steps per day was highest among 5 to 10 year old boys (17% in both 2005-2007 and 2011-2014) and lowest among 15 to 19 year old girls (3% in 2005-2007, 4% in 2011-2014). In general, roughly twice as many boys as girls achieved this criterion. This pattern has persisted over time. A greater proportion of children and youth who participated in organized physical activity and sport achieved the criterion compared to those who did not participate in these types of activities. This relationship was also similar to that found during earlier years.



FIGURE 1

Proportion achieving 16,500 steps on average by age and sex



CANPLAY studies, 2011-2014, CFLRI

### Parent and household characteristics

There were no differences in the proportion of children and youth who achieved an average of 16,500 steps per day by parent's activity level, education, and household income. In previous years, relationships did exist between the proportion achieving this criterion and these parental and household characteristics. For example, in 2007-2009 there was a relationship with household income whereby more children living in the highest income households met this criterion compared to those from lower income households (\$20,000 to \$29,999). Also during 2007-2009, a greater proportion of children whose parents were slightly or substantially more active met this criterion compared to those whose parents were slightly less active. From 2005-2009, a greater proportion of children and youth whose parents were university educated met this criterion compared to those with a secondary education.

### Criteria to approximate newer physical activity guidelines – at least 12,000 or 9,000 steps, 7 days a week

Based on data collected in 2011-2014, 5% of children achieved at least 12,000 steps, 7 days of the week, whereas 18% achieved at least 9,000 steps, 7 days per week. Although the proportion achieving 12,000 or more daily steps in 2011-2014 was similar to the proportion at baseline (2005-2007) and in 2009-2011, it was lower than that in 2007-2009. As for 9,000 or more daily steps, the proportion achieving this criterion was lower in 2011-2014 compared to the rates in 2009 and earlier. Compared to the national average, there were no significant differences by province or territory for both criteria in 2011-2014.

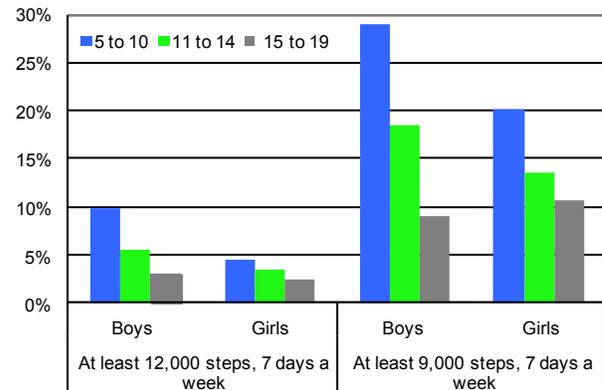
### Child characteristics

More boys than girls achieved both of these criteria in each of the four time periods. A greater proportion of younger children (aged 5 to 10 years) achieved these criteria compared to their older counterparts, and indeed young boys were the highest

proportion achieving these criteria; this age-related decrease has persisted over time. A greater proportion of children and youth who participated in organized physical activity and sport achieved both of these criteria compared to those who do not. This relationship appeared in 2011-2014 and also in previous years.

FIGURE 2

Proportion achieving two other step criteria by age and sex



CANPLAY studies, 2011-2014, CFLRI

### Parental and household characteristics

There were no differences in the proportion of children and youth achieving at least 12,000 steps, 7 days a week by parent's activity level, education, and household income. From 2007-2011, a relationship existed with household income whereby a higher proportion of children and youth living in the highest income households achieved this criterion compared to those living in lower income households. For achieving at least 9,000 daily steps, a higher proportion of children and youth living in the highest income households achieve this criterion compared to those living in households with income ranges between \$40,000 and \$59,999. Moreover, a greater proportion of children and youth whose parents consider themselves slightly more active than their peers met this criterion compared to those whose parents were slightly less active.

### Step criteria based on normative data

Tudor-Locke and colleagues reviewed existing literature regarding objectively measured step data for children and youth with the purpose of providing evidence-based recommendations for steps required per day.<sup>3</sup> These researchers suggested a range of step values based on gender and age. Based on the literature, for:

- boys aged 6 to 11, a range from 13,000 to 15,000 would be appropriate
- girls aged 6 to 11, a range of 11,000 to 12,000 would be appropriate; and,
- adolescents aged 12 to 19, a range of 10,000 to 11,700 would be appropriate.

For the purpose of this bulletin, criteria were developed where average step values fell (1) *below* the minimum threshold or value of the range, (2) *within* the specified range, and (3) *above* or *exceeds* the range, and also included 5 year olds into the first two categories. Using this definition, 54% of children and youth were not active enough, in that their daily steps fell *below* the minimum value in the range. Fifteen percent (15%) achieved steps that fell *within* the range, and a further 31% took an amount of steps that *exceeded* this range.

### Child characteristics

There are no gender differences in the proportion of children and youth that are considered not active enough or who *exceed* the range, however, a greater proportion of boys compared to girls fell *within* the range of steps. Young people (14 years or younger) are more likely to *exceed* the criterion, whereas older teens (15 to 19 year olds) are more likely to be considered *below* the criterion. A greater proportion of young girls (5 to 10 year olds) *exceed* the range compared to boys of the same age, whereas more boys in this age group fell *within* or *below* the range of step values. A greater proportion of older teenage girls (15 to 19 year olds) fell *below* the range, whereas relatively more boys of this same age *exceed* the range.

Children and youth who participate in organized physical activities and sports are more likely to *exceed* the criterion, whereas those who do not participate are more likely to be considered *below* the criterion.

### Parent and household characteristics

A greater proportion of children whose parents consider themselves to be slightly less active than parents the same age and sex fell *below* the range compared to those whose parents considered themselves to be slightly more active. Children whose parents have a university education are more likely to *exceed* the range compared to children whose parents have a college education, whereas the latter are more likely to fall *below* the range. Children living in the highest income households are more likely to *exceed* the range of step values compared to those from some lower income households, whereas the opposite relationship is true among those falling *below* the range.

Compared to the national average, a greater proportion of children and youth living in Newfoundland and Labrador fall *below* the range, whereas a lower proportion of children and youth living in Saskatchewan and Yukon fall *below* the minimum value.

### References

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2. Adams MA, Johnson WD, Tudor-Locke C. Steps/day translation of the moderate-to-vigorous physical activity guideline for children and adolescents. *Int J Behav Nutr Phys Act.* 2013; 10(49).
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