

## Health Fact Sheets

# Blood pressure of children and adolescents, 2016-2019

Release date: March 23, 2021



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# Health Fact Sheets

Statistics Canada, Catalogue no.82-625-X

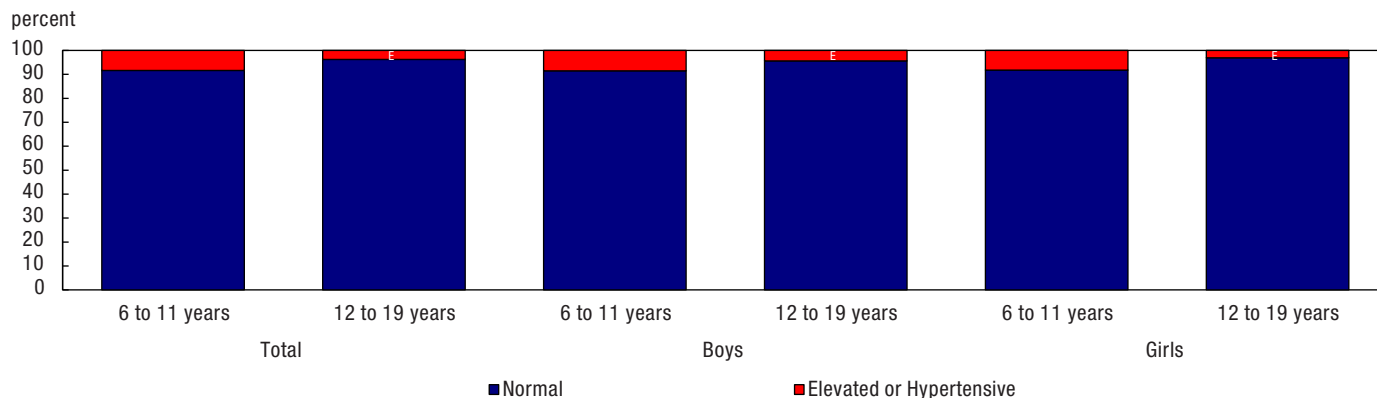
## Blood pressure of children and adolescents, 2016-2019

The combined results of the 2016-2019<sup>1</sup> Canadian Health Measures Survey (CHMS) indicate that the average resting blood pressure of children and youth aged 6 to 19 was 96/62 mmHg. Among this group, 94.3% had a measured blood pressure that was considered normal and 5.7% had results considered borderline or elevated (data not shown). Reliable estimates of hypertension in children are scarce, however studies have shown that children's hypertension has increased over the past decade partially due to an increase in childhood obesity. A systematic review estimated that the global prevalence of childhood hypertension in 2015 ranged from 4.3% among children aged 6 years to 3.2% among those aged 19 years and peaked at 7.9% among those aged 14 years.<sup>2</sup>

The CHMS results indicate that in children aged 6 to 11, average resting blood pressure was 93/61 mmHg, while youth aged 12 to 19 had an average resting blood pressure of 99/62 mmHg.

The proportion of girls aged 12 to 19 with blood pressure in the normal range was significantly higher than that of girls aged 6 to 11 (Chart 1).

**Chart 1** Distribution of household population aged 6 to 19, by blood pressure classification, sex and age group, Canada, 2016-2019



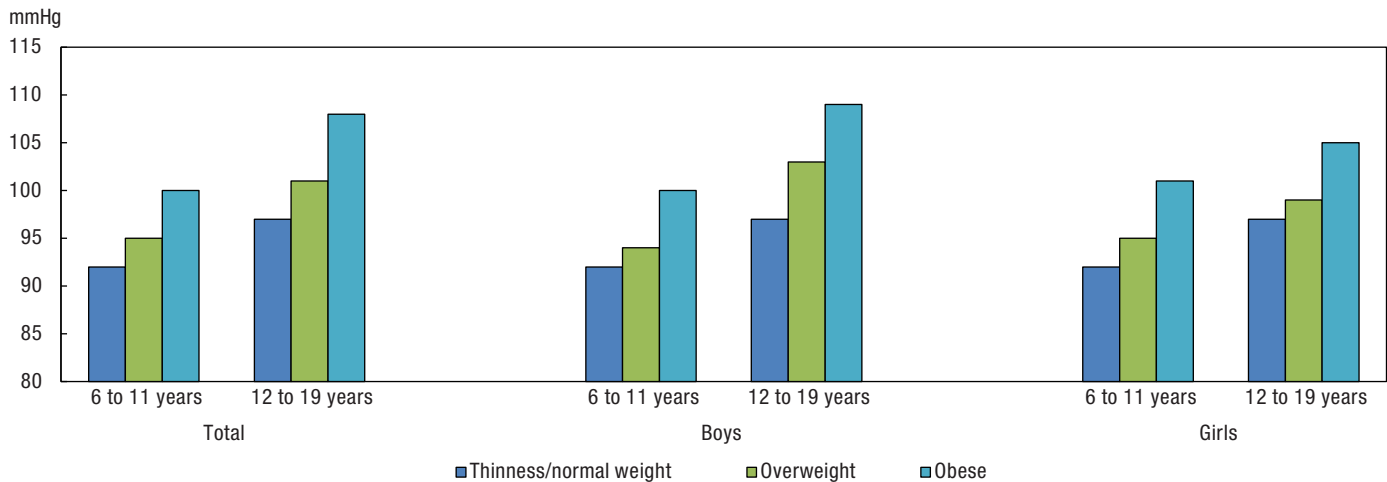
<sup>E</sup> use with caution.

**Source:** Canadian Health Measures Survey, Cycle 5 (2016 and 2017) and Cycle 6 (2018 and 2019).

## Blood pressure and body composition

Height and weight were measured for all CHMS respondents. Children and youth who were classified as being overweight (98/62 mmHg) or obese (104/66 mmHg) had a significantly higher average blood pressure than normal weight children (95/61 mmHg). Average systolic blood pressure was significantly higher in overweight and obese children compared with those in the normal weight category (Chart 2). As well, overweight and obese children had significantly higher average diastolic blood pressure when compared with their normal weight counterparts (Chart 3).<sup>3,4,5,6</sup>

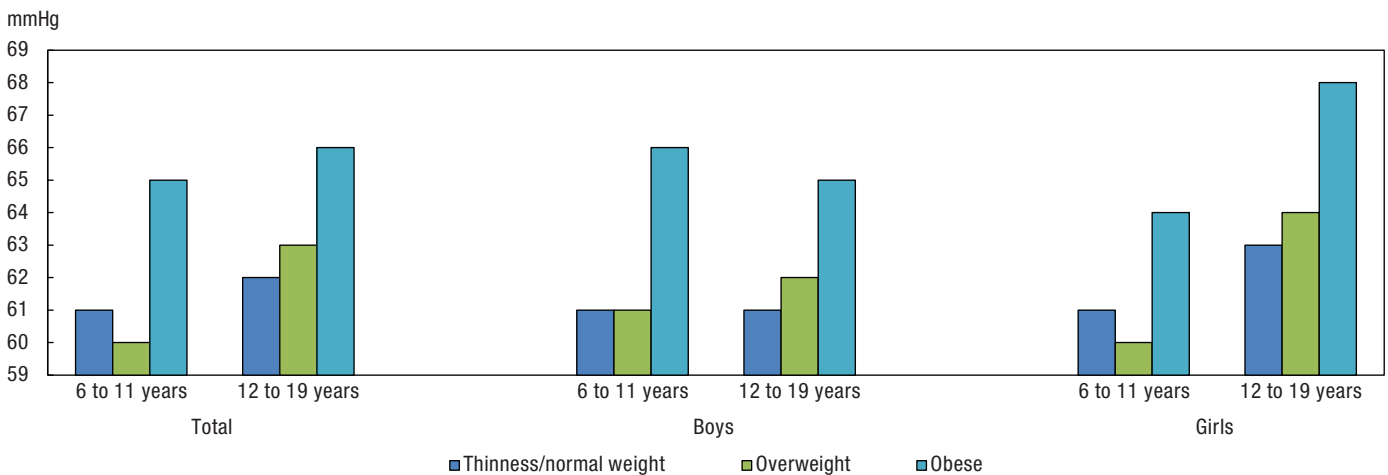
**Chart 2** Average systolic blood pressure (mmHg) of children and youth aged 6 to 19, by body mass index (BMI), sex and age group, household population, Canada, 2016–2019



**Note:** The body mass index (BMI) classification is based on de Onis et al. for children and youth aged 6 to 17, and on the *Canadian guidelines for body weight classification in adults* (Health Canada, 2003) for youth aged 18 to 19.

**Source:** Canadian Health Measures Survey, Cycle 5 (2016 and 2017) and Cycle 6 (2018 and 2019).

**Chart 3** Average diastolic blood pressure (mmHg) of children and youth aged 6 to 19, by body mass index (BMI), sex and age group, household population, Canada, 2016-2019



**Note:** The body mass index (BMI) classification is based on de Onis et al. for children and youth aged 6 to 17, and on the *Canadian guidelines for body weight classification in adults* (Health Canada, 2003) for youth aged 18 to 19.

**Source:** Canadian Health Measures Survey, Cycle 5 (2016 and 2017) and Cycle 6 (2018 and 2019).

## About blood pressure

Blood pressure is a measure of the force of blood against the artery walls, and is expressed as systolic pressure/diastolic pressure in millimetres of mercury (e.g., 120/80 mmHg). The systolic pressure (top number) is the pressure when the heart contracts and pushes the blood out, and the diastolic pressure (bottom number) is the lowest pressure when the heart relaxes between beats.

Resting blood pressure was measured in the CHMS using an automated device (BPTru™) following a five-minute rest period. The BPTru™ recorded six measurements, one minute apart. The average systolic and diastolic blood pressure were calculated using the last five out of six measurements.

The criteria for blood pressure classification in children and youth are as follows:

Category	Description	
	Ages 6 to 17 <sup>2</sup>	Ages 18 and 19 <sup>3</sup>
Normal	SBP and DBP < 90 <sup>th</sup> percentile	Mean SBP/DBP < 120/80 mmHg
Borderline	SBP or DBP ≥ to the 90 <sup>th</sup> percentile, but < the 95 <sup>th</sup> percentile OR Measured mean SBP/DBP > 120/80 mmHg	Mean SBP of 120-139 mmHg and mean DBP of 80-89 mmHg OR Mean SBP of 120-139 mmHg and mean DBP < 80 mmHg OR Mean SBP < 120 mmHg and mean DBP of 80-89 mmHg
Elevated	SBP or DBP ≥ 95 <sup>th</sup> percentile OR Respondent reported using BP medication within the past month	Mean SBP/DBP of ≥ 140/90 mmHg OR Respondent reported using BP medication within the past month

SBP systolic blood pressure  
DBP diastolic blood pressure

## Data

The Canadian Health Measures Survey (CHMS) is a two-step survey. The first step is a personal interview at the respondent's household. The second step is a visit to the CHMS mobile clinic where physical measurements and blood and urine samples are taken.

The 2016–2019 reference period refers to combined results from Cycle 5 (2016 and 2017) and Cycle 6 (2018 and 2019) of the CHMS.

The target population for the CHMS consists of persons 3 to 79 years of age living in the 10 provinces. The observed population excludes: persons living in the three territories; persons living on reserves and other Aboriginal settlements in the provinces; full-time members of the Canadian Forces; the institutionalized population and residents of certain remote regions. Altogether these exclusions represent approximately 3% of the target population.

Survey weight and bootstrap weight files and instructions are available for combining Cycle 6 Canadian Health Measures Survey data (where possible) with equivalent data from Cycles 1 to 5.

Canadian Health Measures Survey data related to this Health Fact Sheet are available in data tables [13-10-0319-01](#), [13-10-0326-01](#) and [13-10-0373-01](#).

## Notes

1. Blood pressure data from Cycle 5 (2016 and 2017) and Cycle 6 (2018 and 2019) of the CHMS were combined for this fact sheet.
2. Song P, Zhang Y, Yu J, et al. Global Prevalence of Hypertension in Children: A Systematic Review and Meta-analysis. *JAMA Pediatr.* 2019;173(12):1154–1163. [doi:10.1001/jamapediatrics.2019.3310](https://doi.org/10.1001/jamapediatrics.2019.3310)
3. National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents. “The fourth report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents.” *Pediatrics.* 2004. 114(2 Suppl. 4th report):555–76.
4. Chobanian AV, Bakris GL, Black HR, et al. 2003. “Seventh report on the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure.” *Hypertension.* 42(6):1206–52.
5. Health Canada. 2003. *Canadian Guidelines for Body Weight Classification in Adults.* Ottawa.
6. de Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. 2007. “Development of a WHO growth reference for school-aged children and adolescents.” *Bulletin of the World Health Organization.* 85(9):660 to 667.

For more information on the Canadian Health Measures Survey, please contact Statistics Canada's Statistical Information Service (toll-free 1-800-263-1136; 514-283-8300; [STATCAN.infostats-infostats. STATCAN@canada.ca](mailto:STATCAN.infostats-infostats@STATCAN@canada.ca)).