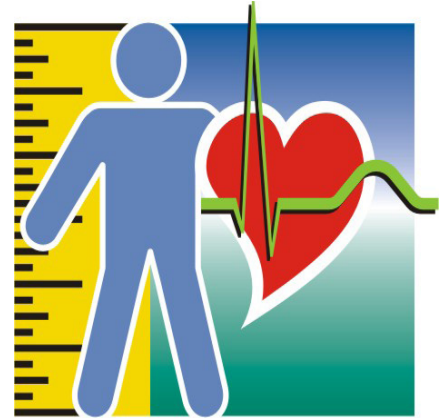


Health Fact Sheets

Cholesterol levels of adults, 2012 to 2013



How to obtain more information

For information about this product or the wide range of services and data available from Statistics Canada, visit our website, www.statcan.gc.ca.

You can also contact us by

email at STATCAN.infostats-infostats.STATCAN@canada.ca

telephone, from Monday to Friday, 8:30 a.m. to 4:30 p.m., at the following numbers:

- | | |
|---|----------------|
| • Statistical Information Service | 1-800-263-1136 |
| • National telecommunications device for the hearing impaired | 1-800-363-7629 |
| • Fax line | 1-514-283-9350 |

Depository Services Program

- | | |
|------------------|----------------|
| • Inquiries line | 1-800-635-7943 |
| • Fax line | 1-800-565-7757 |

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner. To this end, Statistics Canada has developed standards of service that its employees observe. To obtain a copy of these service standards, please contact Statistics Canada toll-free at 1-800-263-1136. The service standards are also published on www.statcan.gc.ca under “Contact us” > “Standards of service to the public.”

Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued co-operation and goodwill.

Standard table symbols

The following symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^P preliminary
- ^r revised
- X suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

Published by authority of the Minister responsible for Statistics Canada

© Minister of Industry, 2014

All rights reserved. Use of this publication is governed by the Statistics Canada [Open Licence Agreement](#).

An HTML version is also available.

Cette publication est aussi disponible en français.



Cholesterol levels of adults, 2012 to 2013

Cholesterol is an essential building block within the human body. The majority of cholesterol in the body is manufactured in the liver, and the rest comes from the food we eat. Unhealthy cholesterol levels, or dyslipidemia, can have negative effects on blood vessels and cardiovascular health, and is a significant risk factor for cardiovascular disease.¹

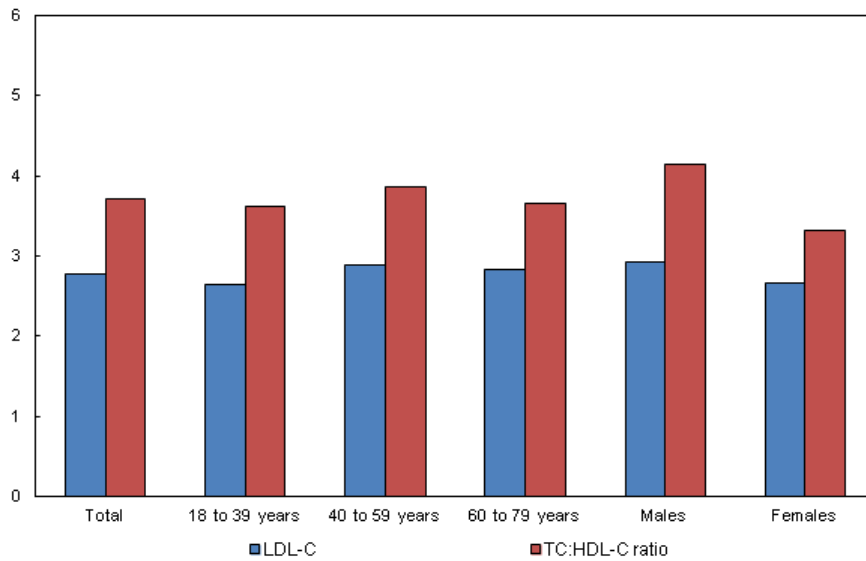


Average cholesterol levels

Results from the 2012 to 2013 Canadian Health Measures Survey (CHMS) indicate that for adults aged 18 to 79, the average blood concentration of low-density lipoprotein cholesterol (LDL-C) was 2.78 mmol/L (see About cholesterol). The average LDL-C (low-density lipoprotein cholesterol) for the 18 to 39 age group (2.64 mmol/L) was significantly lower than the 40 to 59 age group (2.89 mmol/L) (Chart 1). For high-density lipoprotein cholesterol (HDL-C), the average blood concentration was 1.38 mmol/L which was similar across all age groups (data not shown). The average total cholesterol to HDL-C (high-density lipoprotein cholesterol) ratio (TC:HDL-C (high-density lipoprotein cholesterol)) was 3.7 for adults aged 18 to 79. Those aged 40 to 59 had a significantly higher TC:HDL-C (high-density lipoprotein cholesterol) ratio (3.9) compared to those aged 60 to 79 (3.7) (Chart 1).

Chart 1
Average blood concentrations of LDL-C and TC:HDL-C ratio in adults aged 18 to 79, by sex and age group, household population, Canada, 2012 to 2013

mmol/L, ratio



LDL-C low-density lipoprotein cholesterol.

TC:HDL-C ratio of total cholesterol to high-density lipoprotein cholesterol.

Note: Healthy blood concentration of LDL-C is ≤ 3.5 mmol/L and a healthy TC:HDL-C ratio is ≤ 5.0 .

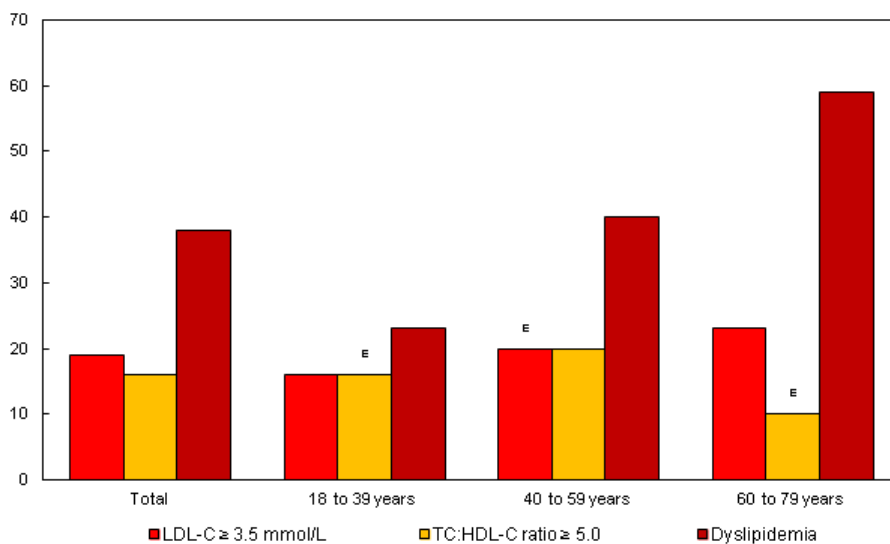
Source: Canadian Health Measures Survey, 2012 to 2013.

Overall blood cholesterol profiles differed significantly between males and females. LDL-C (low-density lipoprotein cholesterol) (2.66 mmol/L) and the TC:HDL-C (high-density lipoprotein cholesterol) ratio (3.3) were both lower in females compared to males (LDL-C (low-density lipoprotein cholesterol): 2.93 mmol/L, TC:HDL-C (high-density lipoprotein cholesterol) ratio: 4.1)(Chart 1). HDL-C (high-density lipoprotein cholesterol) was higher in females (1.53 mmol/L) compared to males (1.23 mmol/L)(Data not shown).

It was determined that 19% of individuals aged 18 to 79 were living with unhealthy LDL-C (low-density lipoprotein cholesterol) levels and 16% of individuals were living with an unhealthy TC:HDL-C (high-density lipoprotein cholesterol) ratio (Chart 2). The 40 to 59 age group had a significantly higher percentage of individuals with an unhealthy TC:HDL-C (high-density lipoprotein cholesterol) ratio (20%) compared to the 60 to 79 age group (10%) (Chart 2).

Chart 2
Percentage of Canadian adults aged 18 to 79 with unhealthy cholesterol levels¹ or dyslipidemia,² by age group, household population, Canada, 2012 to 2013

percent



LDL-C low-density lipoprotein cholesterol.

TC:HDL-C total cholesterol to high-density lipoprotein cholesterol.

E use with caution (data with a coefficient of variation from 16.6% to 33.3%)

1. Unhealthy levels based on Anderson et al.

2. Dyslipidemia defined as LDL-C \geq 3.5 mmol/L, or TC:HDL-C ratio \geq 5.0, or self-reported use of lipid-modifying medication.

Source: Canadian Health Measures Survey, 2012 to 2013.

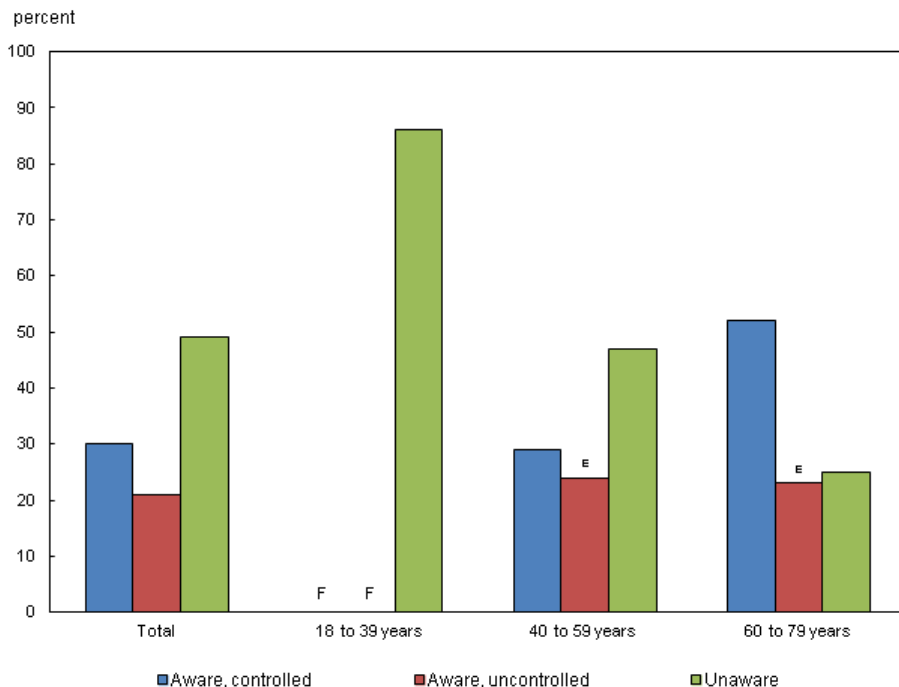
With regards to sex differences, males (23%) had a higher percentage of individuals living with unhealthy LDL-C (low-density lipoprotein cholesterol) levels compared to females (16%) although the difference was not significant (data not shown).

Dyslipidemia

Dyslipidemia was defined as having unhealthy blood concentrations of LDL-C (low-density lipoprotein cholesterol) (\geq 3.5mmol/L), or a TC:HDL-C (high-density lipoprotein cholesterol) ratio \geq 5.0, or self-reported use of a lipid-modifying medication. Dyslipidemia was measured or self-reported in 38% of individuals. The prevalence of dyslipidemia differed significantly with age. The prevalence of dyslipidemia was significantly lower for those aged 18 to 39 (23%) compared to those aged 40 to 59 (40%) and those aged 60 to 79 (59%). Dyslipidemia in the 40 to 59 age group was also significantly lower than in the 60 to 79 age group (Chart 2).

Among individuals with dyslipidemia, a total of 51% were aware of their condition (reported being diagnosed with an unhealthy cholesterol level by a health care professional or taking medication). Among those who were aware, 30% had controlled blood cholesterol levels while 21% were measured as having unhealthy LDL-C (low-density lipoprotein cholesterol) levels or a total cholesterol to HDL-C (high-density lipoprotein cholesterol) ratio consistent with dyslipidemia (Chart 3). Those aged 40 to 59 had a significantly lower percentage (29%) of individuals who were aware with controlled blood cholesterol levels compared to the 60 to 79 age group (52%). Those aged 18 to 39 had a significantly higher percentage (86%) of individuals who were unaware of their condition compared to both those aged 40 to 59 (47%) and 60 to 79 (25%). The 40 to 59 age group was also significantly more unaware than the 60 to 79 age group.

Chart 3
Percentage of adults aged 18 to 79 with dyslipidemia who are aware or unaware of the condition, by age group, household population, Canada, 2012 to 2013



E use with caution (data with a coefficient of variation from 16.6% to 33.3%)
 F too unreliable to be published (data with a coefficient of variation (CV) greater than 33.3%; suppressed due to extreme sampling variability)
 Source: Canadian Health Measures Survey, 2012 to 2013.

About cholesterol

Cholesterol is a building block that is vital to human health. It plays an important role in the structure of our cells in addition to helping produce vitamin D and various hormones.¹ There are two main molecules related to cholesterol to consider, and each can have a very different effect on cardiovascular health. Low density lipoproteins transport cholesterol within the blood stream and deposit it in the walls of arteries creating plaque. This is considered the “bad” because an accumulation of plaque on the arterial wall causes an increased risk of cardiovascular disease. In contrast, the high density lipoproteins are considered “good” because they remove cholesterol from the bloodstream and transport it to the liver. They minimize the creation of plaque and reducing the risk for cardiovascular disease.^{1, 3} The ratio of total cholesterol to high density lipoprotein cholesterol (TC:HDL-C (high-density lipoprotein cholesterol)) is also commonly used to assess a person’s cardiovascular risk because it is an indicator of the amount of “good” cholesterol relative to the amount of total cholesterol. Certain people are at a higher risk of cardiovascular disease and thus require greater monitoring of cholesterol levels. These individuals include males aged over 40 and females over 50, menopausal females, people with diabetes, atherosclerosis, abdominal obesity, high blood pressure and people who smoke or have a family history of cardiovascular disease.² In some cases, cholesterol levels can be improved through proper diet and exercise⁴ but may also need to be supplemented with certain medications.⁵

The CHMS measured the concentrations of HDL-C (high-density lipoprotein cholesterol) and total cholesterol in serum which is a component of blood (in millimoles per litre - mmol/L) on a nationally representative sample. LDL-C (low-density lipoprotein cholesterol) in blood (mmol/L) was calculated using the Friedewald equation⁶ for a selected fasted subsample of respondents who had fasted for at least 10 hours prior to the blood draw.

Respondents were also asked to report if they have ever been diagnosed, by a health care professional, with high cholesterol. Respondents also self-reported medications taken in the past month. Any self-reported medication determined to be a “lipid-modifying agent” (according to the Anatomic Therapeutic Classification system) was used to identify respondents being treated for unhealthy blood cholesterol.

Notes

- 1 Castelli, W.P. 1988. "Cholesterol and lipids in the risk of coronary artery disease – the Framingham Heart Study." *Canadian Journal of Cardiology*. Vol. (volume) 4, Supplement A, p. (page) 5A-10A.
- 2 Anderson, T., Grégoire, J., Hegele, R., et al. (and others) 2013. "2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult." *Canadian Journal of Cardiology*. Vol. (volume) 29, p. (page) 151 to 167.
- 3 Toth, P.P. 2008. "When high is low: raising low levels of high-density lipoprotein cholesterol." *Current Cardiology Reports*. Vol. (volume) 10.
- 4 Ministry of Health and Long Term Care. 2013. Lowering your cholesterol through diet and lifestyle. Toronto: Ministry of Health and Long Term Care. <http://www.mhp.gov.on.ca/en/healthy-eating/cholesterol.asp>. Accessed: August 12, 2014.
- 5 Ottawa Heart Institute. Lipid Clinic. Ottawa: University of Ottawa Heart Institute. http://www.ottawaheart.ca/patients_family/lipid-clinic.htm. Accessed: August 12, 2014.
- 6 Friedewald, W., Levy, R., and D. Fredrickson. 1972. "Estimation of the concentration of low-density lipoprotein cholesterol in plasma, without use of the preparative ultracentrifuge." *Clinical Chemistry*. Vol. (volume) 18.

References

- Anderson, T., Grégoire, J., Hegele, R., et al. (and others) 2013. "2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult." *Canadian Journal of Cardiology*. Vol. (volume) 29, p. (page) 151 to 167.
- Castelli, W.P. 1988. "Cholesterol and lipids in the risk of coronary artery disease – the Framingham Heart Study." *Canadian Journal of Cardiology*. Vol. (volume) 4, Supplement A, p. (page) 5A-10A.
- Friedewald, W., Levy, R., and D. Fredrickson. 1972. "Estimation of the concentration of low-density lipoprotein cholesterol in plasma, without use of the preparative ultracentrifuge." *Clinical Chemistry*. Vol. (volume) 18.
- Ministry of Health and Long Term Care. 2013. *Lowering your cholesterol through diet and lifestyle*. Toronto: Ministry of Health and Long Term Care. <http://www.mhp.gov.on.ca/en/healthy-eating/cholesterol.asp>. Accessed: August 12, 2014.
- Ottawa Heart Institute. *Lipid Clinic*. Ottawa: University of Ottawa Heart Institute. http://www.ottawaheart.ca/patients_family/lipid-clinic.htm. Accessed: August 12, 2014.
- Toth, P.P. 2008. "When high is low: raising low levels of high-density lipoprotein cholesterol." *Current Cardiology Reports*. Vol. (volume) 10.

Data

Additional Canadian Health Measures Survey data on this topic are available from CANSIM table 117-0008.

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; infostats@statcan.gc.ca).

Aussi disponible en français.