

Few Canadians had antibodies against SARS-CoV-2 in early 2021

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At the time of this release (early July 2021), over 35 million total COVID-19 tests, and more than 1.4 million cases of COVID-19 (caused by the SARS-CoV-2 virus) have been reported in the total Canadian population (including people living in private households and in institutions). Since not everyone infected with the virus may have been tested, the true number of cases among the total Canadian population is likely higher.

Antibodies are the body's defence against infections from a virus such as SARS-CoV-2. A blood test can be used to detect SARS-CoV-2 antibodies due to a previous infection, or after receiving a COVID-19 vaccine. The proportion of Canadians who have these antibodies is referred to as the seroprevalence of SARS-CoV-2 antibodies.

Statistics Canada, in partnership with Canada's COVID-19 Immunity Task Force, the Public Health Agency of Canada and Health Canada, conducted the Canadian COVID-19 Antibody and Health Survey (CCAHS) to better understand the actual spread of the virus in Canada by estimating how many Canadians over the age of 1 and living in private households have antibodies in their blood against the virus. Data were collected from November 2020 to April 2021. First results of the CCAHS show that about 2.6% of Canadians living in private households had antibodies against SARS-CoV-2 due to a past infection.

Few Canadians protected against SARS-CoV-2 during the study period

Seroprevalence of SARS-CoV-2 antibodies was determined using a new leading-edge laboratory test which, when combined with respondent questionnaire data, was able to distinguish whether the respondent had antibodies due to a past infection from the SARS-CoV-2 virus, or antibodies due to having received a COVID-19 vaccine. Overall, 3.6%, or fewer than 1 in 25 Canadians, had SARS-CoV-2 antibodies in their blood from a previous infection or vaccination, which may indicate some degree of protection against future infection from SARS-CoV-2. About 2.6% of Canadians had antibodies due to a past infection, while about 1% of Canadians had antibodies due to a vaccination, reflecting the fact that vaccination was not widespread during the survey period.

A larger proportion of males than females had antibodies due to past infection

Antibody seroprevalence due to a previous infection was slightly higher in males (2.8%) than females (2.4%). Early in the vaccination campaign, women were significantly more likely than men to have been vaccinated. This could explain why nationally, antibody seroprevalence due to vaccination in females (1.5%) was more than three times higher than in males (0.4%). Due to the higher proportion of females having antibodies due to vaccination, overall antibody seroprevalence (due to past infection, having received a vaccine, or both) was slightly higher among women (3.9%) than men (3.3%).

Antibody seroprevalence due to past infection higher in younger age groups

The overall seroprevalence of SARS-CoV-2 antibodies was 3.4% among children and youth aged 1 to 19 years. Antibody seroprevalence due to vaccination in this age group was too low to report accurately, therefore nearly all of the antibody seroprevalence observed in Canadians aged 1 to 19 was due to a previous infection. Initially, at least one COVID-19 vaccine was approved by Health Canada for youth aged 16 to 19. However, this age group was not a priority for early vaccination. A COVID-19 vaccine was approved in May 2021 for children aged 12 to 15, after the survey study period.

In comparison, the seroprevalence of antibodies due to past infection among Canadian adults was 2.9% for those aged 20 to 59 and 1.4% for those aged 60 and older. Estimates for the Canadian population aged 60 and older do not include those living in an institutional setting, such as a retirement home or in a long-term care setting.

Taking into account both vaccine-induced and antibodies acquired through a past infection, overall antibody seroprevalence was highest within Canadian adults aged 20 to 59 (4.5%). Among those aged 60 and older, overall antibody seroprevalence was 2.1%.



Antibody seroprevalence due to past infection or vaccine varied across the country

SARS-CoV-2 antibody seroprevalence due to a past infection was higher in Alberta (4.0%), followed by Quebec (3.2%), Saskatchewan (2.9%), Ontario (2.5%), Manitoba (2.4%) and British Columbia (1.6%). The proportion of Canadian adults aged 20 and older with antibodies due to vaccination was similar across these provinces, accounting for about one in three adults with antibodies.

Taking into account antibody seroprevalence from both vaccination and past infection, Alberta (5.6%) had the highest overall antibody seroprevalence followed by Quebec (4.4%), Saskatchewan (4.1%), Ontario (3.3%), Manitoba (3.1%) and British Columbia (2.4%).

Within the territories and Atlantic regions, antibody seroprevalence due to vaccination accounted for the majority of the antibody seroprevalence. About 1 in 5 (21.1%) territorial residents had SARS-CoV-2 antibodies due to vaccination. Antibody seroprevalence due to past infection was too low to produce a reliable statistical estimate.

The Atlantic Region, which comprises the four Atlantic provinces, had the lowest antibody seroprevalence due to past infection (0.5%), and the lowest overall antibody seroprevalence (1.3%). In this region, about two out of every three adults aged 20 and older with antibodies in their blood had them due to vaccination. To obtain reliable seroprevalence estimates, the four Atlantic provinces were grouped together, as were the three territories.

Visible minority Canadians had a higher antibody seroprevalence due to a past infection than non-visible minorities

Visible minority Canadians (4.3%) had a higher proportion of antibodies acquired through past infection compared to non-visible minority Canadians (2.1%). This contributed to a higher overall SARS-CoV-2 antibody seroprevalence among visible minorities (4.8%) compared to non-visible minorities (3.3%).

One in three Canadians who had SARS-CoV-2 antibodies due to a previous infection had never been tested before

Not all Canadians displaying SARS-CoV-2 antibodies from a previous infection may have known that they had COVID-19. Among Canadians with these antibodies, about one in three (30.3%) reported never having taken a COVID-19 nasal or throat swab test. From this group, three out of four, (76.6%) indicated that it was because they did not have symptoms. While this statistic alone does not estimate the degree of asymptomatic spread of SARS-CoV-2 in the population, it does confirm that asymptomatic spread contributed to infection rates.

Table 1
National SARS-CoV-2 antibody seroprevalence estimates, by antibody seroprevalence type and sex

	Antibody seroprevalence overall percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to infection percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to vaccination percentage	Low 95% Confidence Interval	High 95% Confidence Interval
Both Sexes	3.6	2.6	4.2	2.6	1.6	3.2	1.0	0.0	1.3
Males	3.3	2.2	4.1	2.8	1.8	3.6	0.4	0.0	0.6
Females	3.9	2.8	4.7	2.4	1.3	3.0	1.5	0.5	2.0

Note(s): Some seroprevalence estimates may not add correctly due to rounding.
Source(s): Statistics Canada; Canadian COVID-19 Antibody and Health Survey (5339).

Table 2
National SARS-CoV-2 antibody seroprevalence estimates, by antibody seroprevalence type and age group

	Antibody seroprevalence overall percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to infection percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to vaccination percentage	Low 95% Confidence Interval	High 95% Confidence Interval
All age groups	3.6	2.6	4.2	2.6	1.6	3.2	1.0	0.0	1.3
1 to 19 years	3.4	2.2	4.6	3.3	2.1	4.5	x	x	x
20 to 59 years	4.5	3.3	5.5	2.9	1.8	3.7	1.6	0.6	2.0
60 years or older	2.1	1.0	2.7	1.4	0.4	1.9	0.7	0.0	1.2

x suppressed to meet the confidentiality requirements of the *Statistics Act*
Source(s): Statistics Canada; Canadian COVID-19 Antibody and Health Survey (5339).

Table 3
Provincial or Regional SARS-CoV-2 antibody seroprevalence estimates, by antibody seroprevalence type

	Antibody seroprevalence overall percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to infection percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to vaccination percentage	Low 95% Confidence Interval	High 95% Confidence Interval
Canada	3.6	2.6	4.2	2.6	1.6	3.2	1.0	0.0	1.3
Atlantic Region	1.3	0.3	1.8	0.5	0.0	0.7	0.9	0.0	1.3
Quebec	4.4	3.2	5.4	3.2	2.1	4.1	1.2	0.2	1.7
Ontario	3.3	1.6	5.5	2.5	1.1	4.4	0.8	0.0	1.9
Manitoba	3.1	1.8	4.5	2.4	1.2	3.6	0.7	0.0	1.5
Saskatchewan	4.1	2.6	5.7	2.9	1.6	4.3	1.2	0.1	2.2
Alberta	5.6	4.0	7.4	4.0	2.6	5.7	1.6	0.3	3.4
British Columbia	2.4	1.1	3.9	1.6	0.5	2.9	0.8	0.0	1.7
Territories Region	21.1	17.6	25.0	0.0	0.0	0.8	21.1	17.6	25.0

Note(s): Some seroprevalence estimates may not add correctly due to rounding.
Source(s): Statistics Canada; Canadian COVID-19 Antibody and Health Survey (5339).

Table 4
National SARS-CoV-2 antibody seroprevalence estimates, by antibody seroprevalence type and visible minority status

	Antibody seroprevalence overall percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to infection percentage	Low 95% Confidence Interval	High 95% Confidence Interval	Antibody seroprevalence due to vaccination percentage	Low 95% Confidence Interval	High 95% Confidence Interval
Visible Minority	4.8	3.1	6.8	4.3	2.6	6.3	0.5	0.0	1.2
Not a Visible Minority	3.3	2.3	3.9	2.1	1.1	2.6	1.2	0.2	1.5

Source(s): Statistics Canada; Canadian COVID-19 Antibody and Health Survey (5339).

Note to readers

First results from the Canadian COVID-19 Antibody and Health Survey (CCAHS) are now available. The survey was administered by Statistics Canada in collaboration with Canada's COVID-19 Immunity Task Force, Health Canada and the Public Health Agency of Canada. From November 2020 to April 2021, Canadians aged 1 and older living in private households were tested for antibodies against SARS-CoV-2 (the virus that causes COVID-19) through the CCAHS. Data were collected across four collection periods, with the bulk of collection completed in January and February 2021.

Survey weights were adjusted to minimize any potential bias that could arise from survey non-response; non-response adjustments and calibration using available auxiliary information were also applied and are reflected in the survey weights provided with the data file. Some additional auxiliary information from provincial COVID-19 case counts was also used to make weight adjustments. In addition to survey weights, an extra variance adjustment was applied to account for expected variability from the laboratory test. Despite adjustments and calibrations reflected in the survey weights, the high degree of non-response to the survey increases the risk of remaining bias. This remaining bias may impact estimates produced using the survey data.

Results tables containing 95% confidence intervals are available. Confidence intervals are used to express the precision of the estimate. A 95% confidence interval indicates that the true proportion in the population will be between the lower and upper confidence interval 95 times out of 100. Some estimates may not add correctly due to rounding.

Studies from other countries have aimed to determine their national seroprevalence of antibodies against SARS-CoV-2 at different points in time. A study from July 2020 showed that the seroprevalence of SARS-CoV-2 antibodies in the United Kingdom was 6.0%. In the United States, a study ending in September 2020 indicated that fewer than one in ten Americans had antibodies against SARS-CoV-2 at that time.

As the national vaccination campaign for the Canadian population was starting through the survey collection period, the data represent the percentage of Canadians who had SARS-CoV-2 antibodies due to either an infection, vaccination, or both when referring to overall antibody seroprevalence. When the respondent likely had antibodies due to both infection and vaccination, they were counted as having antibodies due to an infection. Laboratory data were used in combination with questionnaire response data to help determine whether a sample contained antibodies against SARS-CoV-2 due to a previous infection or vaccination. In some instances, only overall seroprevalence was reported, or provincial estimates were combined to produce a reliable estimate at a regional level. Careful interpretation is therefore required when attempting to draw conclusions about some antibody seroprevalence estimates.

Populations excluded from the CCAHS include persons living in the rural areas of the three territories (outside of the capitals); persons living on reserves and other Indigenous settlements in the provinces; full-time members of the Canadian Forces; persons living in institutions and residents of certain remote regions. Estimates for the territories were therefore determined by sampling residents of the three territorial capitals. National, provincial and territorial COVID-19 case counts from public health authorities would include these populations excluded from the CCAHS.

Available tables: table [13-10-0818-01](#).

Definitions, data sources and methods: survey number [5339](#).

The table "SARS-CoV-2 antibody seroprevalence in Canadians, by age group and sex, November 2020 to April 2021" is now available. This table provides national, as well as regional or provincial estimates of the prevalence of antibodies against SARS-CoV-2 among Canadians, by age group and sex.

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).