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Compliance with precautions to reduce the spread of COVID-19 in Canada

by Jonathan Cabot and Tracey Bushnik

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ABSTRACT

Background

Throughout the COVID-19 pandemic, Canadian public health officials have mandated and recommended precautions to slow the spread of COVID-19. This study examined which population groups were less compliant with precautions, such as mask-wearing and self-isolating, and where they were located in Canada.

Data and methods

Results are from the Canadian COVID-19 Antibody and Health Survey, a national survey aimed at estimating how many Canadians who were older than one year and living in private households had antibodies in their blood against the SARS-CoV-2 virus. Questionnaire data were collected in the 10 provinces and 3 territorial capitals, from November 2020 to April 2021. Respondents were asked about compliance with precautions related to COVID-19. Weighted prevalences and logistic regression models were used to identify which population groups were less compliant with precautions to prevent the spread of COVID-19, and where they were located in Canada.

Results

Significant differences in compliance with precautions were found by sex, region, urban versus rural location, age, income, presence of chronic conditions, household size and work status. With covariate adjustment, Canadians who were less compliant with precautions were males, those living in the territorial capitals, those in rural areas, and people aged 34 and younger (compared with people aged 65 and older). Additional differences were found when analyzing compliance with consistently recommended precautions compared with those usually recommended.

Interpretation

As Canada continues to navigate the waves of the pandemic, and with the emergence of new variants, precautions are still being mandated or recommended in many jurisdictions and locations. Continuing to understand which population groups were less compliant in earlier waves and where they were located in Canada can be beneficial to ongoing and future public health efforts to slow the transmission of COVID-19.

Keywords

COVID-19, SARS-CoV-2, precautions, health

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What is already known on this subject?

- One way to slow the spread of COVID-19 is through engaging in various precautionary behaviours, such as social distancing and wearing a mask.
- Studies suggest that certain population groups including females, older individuals, individuals with pre-existing health conditions, individuals residing in urban areas, individuals with higher education and health care workers are more likely to follow precautions.
- Stopping the transmission of COVID-19 through mandated and recommended precautionary behaviours continues to be a public health strategy in Canada.

What does this study add?

- The Canadian COVID-19 Antibody and Health Survey is a new, nationally representative survey that asked respondents about the degree to which they were compliant with a selected list of precautions as protection against COVID-19.
- A total of six precautions were assessed; three were considered to be “consistently recommended” and three “usually recommended.”
- Males, individuals living in rural areas, individuals living in the territorial capitals, and individuals aged 34 or younger (compared with people aged 65 or older) were less compliant overall, even after taking other characteristics into account. Compliance also differed according to whether precautions were “consistently” or “usually” recommended.

Since the onset of the COVID-19 pandemic, jurisdictions around the world have implemented measures to slow the spread of the virus. With the goal of curbing the transmission of COVID-19 and reducing the burden on the health care system, Canadian provinces and territories have used various strategies, such as closing nonessential businesses, mandating the use of masks in public spaces and limiting contact among people.¹ These strategies have had varying degrees of success in containing the virus since March 2020, with observed disparities in the seroprevalence rates across the country.²

While seroprevalence estimates help identify how infection has varied across Canada², examining differences in compliance with precautionary behaviours between population groups may be important in understanding how COVID-19 has spread and may continue to do so in Canada. One way to slow this spread is through engaging in various precautionary behaviours related to social distancing and wearing masks.³ The primary methods recommended by the World Health Organization for minimizing risk of infection are wearing masks, physical distancing, avoiding crowds, frequent hand washing and self-isolating if testing positive or developing symptoms.⁴ However, compliance with precautions varies among population groups. Studies have shown that women and older people,^{5,6,7,8} those with pre-existing health conditions,⁷ individuals residing in urban areas,⁵ and health care workers⁸ are more likely to be compliant with precautions. In Canada, studies have found that women and older adults have greater trust in public health measures and are more confident in their ability to comply with them.⁹ Early COVID-19 pandemic research using crowdsourced data found that males, rural residents and adults

with lower education were less likely to adhere to precautions to reduce the spread of COVID-19 in Canada.¹⁰ However, Jehn et al¹⁰ analyzed data from a relatively small sample prior to the roll-out of vaccines, measured adherence to four precautions and did not include many sociodemographic variables. This underlines the need for analysis using a larger, nationally representative dataset, with additional precautions and characteristics measured in a more recent context.

Despite the proportion of the population that is already vaccinated,¹¹ there has been a sharp increase in infections with the spread of additional variants, including Omicron.¹² This has resulted in the reintroduction of various restrictions across many jurisdictions, and Canadians are being encouraged to comply. Understanding patterns in compliance with precautions throughout the pandemic—even during earlier waves when vaccination, previous COVID-19 infection and potential pandemic fatigue¹³ may not have been as prevalent—remains vital to public health efforts to limit virus transmission.

Using nationally representative data from the Canadian COVID-19 Antibody and Health Survey (CCAHS), the present analysis examines which population groups were less compliant with certain precautions to prevent the spread of COVID-19 between November 2020 and April 2021, and where they were located in Canada. Insights from this analysis can serve to identify groups to target for policy makers related to the COVID-19 pandemic and for future public health crises.

Methods

Data source

Data are from the Canadian COVID-19 Antibody and Health Survey (CCAHS), a cross-sectional national survey conducted by Statistics Canada. The CCAHS collected information from respondents in two parts: an electronic questionnaire completed online, which asked about demographics, exposure and behaviours related to COVID-19, and an at-home finger-prick blood test to estimate the seroprevalence of antibodies against the SARS-CoV-2 virus in Canadians older than one year, living in private households. Respondents were contacted by telephone if Statistics Canada did not receive their completed questionnaire. Data were collected from Canadians from November 2020 to April 2021. The CCAHS used a direct sampling frame for respondents aged 1 to 24 years, and a multi-stage sampling frame for respondents aged 25 or older for its selected sample of 47,900 Canadians across the 10 provinces and 3 territorial capitals. For respondents younger than 15 years, the questionnaire was answered by a parent or guardian. In total, the sample yielded 11,026 completed questionnaires for a 23% combined response rate. Survey weights accounting for the sampling design and survey non-response were produced, which allowed weighted estimates to be representative of the target population. Person weights were calibrated so that the sum of weights matched demographic population counts at the region level by age group and sex, while also matching demographic counts for large census metropolitan areas. Populations excluded from the CCAHS are 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; individuals living on Canadian Forces bases; persons living in institutions and residents of certain remote regions. Altogether, these exclusions represent approximately 3% of the target population of people aged one year or older living in private households. More information on the design and weighting of the CCAHS can be found on the Statistics Canada website.¹⁴

Most of the collection (86%) was completed during January and February 2021, in the later stages of the second wave of the pandemic in Canada.¹² Collection also coincided with the start of vaccination efforts in Canada. By the end of March 2021, just under 12% of Canadians (about 4.5 million people) had received at least one dose of a COVID-19 vaccine.¹¹ These Canadians were predominantly adults aged 80 or older; health care workers; residents and staff in congregate living settings; and adults living in Indigenous communities.¹⁵

Measures

Precautions

CCAHS respondents were asked, “Which of the following precautions are you taking as protection against COVID-19?” They could respond, “always,” “often,” “occasionally,” “never”

or “not applicable.” The following precautions were included in this analysis:

- Wash hands often.
- Wear a mask in indoor public spaces where physical distancing is difficult or a mandatory mask by-law exists.
- Wear a mask in outdoor public places where physical distancing is difficult or required.
- Keep a 2 meter or 6 foot distance from others.
- Avoid crowds and large gatherings.
- Limit contact with people at higher risk.

A score was assigned for how often a respondent engaged in each precaution. “Never” was assigned a score of 0, “occasionally” a score of 1, “often” a score of 2 and “always” a score of 3. “Not applicable” was set to “missing.”

Overall Scores were summed for all six precautions into an overall score (maximum value of 18), where higher scores indicated higher compliance. This score was highly skewed (mean= 15.6). It was dichotomized to differentiate less compliant (bottom 10th percentile, scores under 13) from compliant (score 13 or above).

Consistently recommended “Wash hands often,” “wear a mask indoors” and “keep a 2 metre distance” were consistently recommended by governments and public health officials throughout the CCAHS collection period,¹ and their scores were summed into a consistently recommended score (maximum value of 9). The score was highly skewed (mean= 8.0) and was dichotomized into less compliant (bottom 10th percentile, scores under 7) and compliant (score 7 or above).

Usually recommended “Wear a mask outdoors,” “avoid crowds or large gatherings,” and “limit contact with people at higher risk” were summed into a usually recommended score (maximum value of 9) because these precautions were not consistently recommended throughout the CCAHS collection. For example, when COVID-19 cases dropped, wearing a mask outdoors in some jurisdictions was no longer required in public spaces, such as private outdoor gatherings and markets; the number of people allowed in public and private gatherings increased¹. In addition, contact with people at higher risk was permitted under certain conditions¹, e.g., when those at higher risk had received their first doses of the vaccine.¹⁵ The score was highly skewed (mean= 7.6) and was dichotomized into less compliant (bottom 10th percentile, scores under 6) and compliant (score 6 or above).

Covariates

Covariates included sex at birth (male, female), age group (1 to 18, 19 to 34, 35 to 64, and 65 or older), living in rural versus urban areas, highest level of education (postsecondary school graduation versus lower education), household size (1, 2, 3, and 4 or more people) and dwelling type (duplex, low-rise or high-

rise apartment versus single detached, double, row or terrace dwelling).

Region included the Atlantic provinces (New Brunswick; Nova Scotia; Newfoundland and Labrador; and Prince Edward Island), Quebec, Ontario, the Prairies (Manitoba; Saskatchewan; and Alberta), British Columbia and the territorial capitals.

Adjusted household income quintile was derived by using a modified version of the equivalence score method where household income is adjusted by a weight factor based on the number of people in the household.¹⁶

Type of work was split into three groups: health care worker in direct contact with others; other type of worker in direct contact with others; and unemployed, or workers not in direct contact with others. Respondents who reported working in direct contact with others were asked about their occupation. If their

Table 1
Prevalence and 95% confidence intervals of being less compliant by selected characteristics, Canada, November 2020 to March 2021

Characteristic	Sample (n)	Population (%)	Overall			Consistently recommended			Usually recommended		
			Prevalence (%)	95% Confidence interval		Prevalence (%)	95% Confidence interval		Prevalence (%)	95% Confidence interval	
				from	to		from	to		from	to
Total	9 646	100,0	10,3	9,4	11,2	8,9	8,0	9,9	10,4	9,6	11,3
Sex											
Male	4 256	45,4	13,8 [§]	12,4	15,3	12,2 [§]	10,7	13,8	13,1 [§]	11,7	14,6
Female [†]	5 390	54,7	7,4	6,4	8,4	6,2	5,2	7,2	8,3	7,3	9,3
Region											
Atlantic	2 687	5,9	11,5 [§]	10,3	12,9	7,5	6,6	8,6	12,6 [§]	11,4	14,0
Quebec	1 999	22,2	10,7	8,8	12,9	7,4	5,7	9,5	11,5	9,7	13,6
Ontario [†]	1 364	41,0	9,3	7,7	11,2	9,5	7,7	11,6	9,4	7,8	11,4
Prairies	2 320	16,7	12,4 [§]	10,7	14,4	10,5	9,0	12,2	12,4	10,5	14,5
British Columbia	891	14,1	8,9	7,0	11,3	7,9	6,3	10,0	8,3	6,5	10,7
Territorial capitals	385	0,2	33,3 [§]	27,9	39,2	31,5 [§]	26,1	37,5	27,1 [§]	21,8	33,1
Rural versus urban											
Rural	2 278	16,3	12,8 [§]	10,8	15,1	11,0 [§]	8,9	13,6	12,9 [§]	10,9	15,2
Urban [†]	7 368	83,7	9,8	8,9	10,8	8,5	7,5	9,5	10,0	9,1	10,9
Age group											
1 to 18	1 716	20,7	13,5 [§]	11,5	15,8	13,5 [§]	11,3	16,0	12,7 [§]	10,7	15,0
19 to 34	1 869	19,5	13,6 [§]	11,7	15,7	12,0 [§]	10,2	14,2	13,8 [§]	11,9	15,9
35 to 64	4 227	42,0	8,9 [§]	7,7	10,2	6,8 [§]	5,7	8,2	9,7 [§]	8,5	11,0
65 and older [†]	1 834	17,8	6,2	4,8	8,0	4,9	3,5	6,9	5,9	4,6	7,5
Education											
High school education or less [†]	1 555	15,5	9,6	7,9	11,6	7,1	5,5	9,2	10,0	8,2	12,1
Postsecondary education	8 083	84,5	10,4	9,5	11,4	9,2 [§]	8,3	10,3	10,5	9,6	11,5
Adjusted household income quintiles											
First quintile (lowest) [†]	1 628	19,5	8,7	7,0	10,7	7,9	6,2	9,9	9,8	7,9	12,0
Second quintile	1 786	19,5	9,9	8,1	12,0	9,1	7,2	11,4	9,9	8,1	12,1
Third quintile	1 993	20,1	12,5 [§]	10,4	14,9	10,6	8,6	13,0	12,0	10,1	14,3
Fourth quintile	2 101	20,3	9,9	8,4	11,6	8,3	6,6	10,3	10,1	8,6	11,8
Fifth quintile (highest)	2 138	20,7	10,4	8,7	12,4	8,6	7,1	10,5	10,4	8,8	12,4
Chronic conditions											
No chronic conditions	6 549	72,9	11,4 [§]	10,4	12,5	10,3 [§]	9,2	11,5	11,4 [§]	10,4	12,4
One chronic condition	2 059	19,9	7,8 [§]	6,3	9,6	6,0	4,6	7,8	8,7 [§]	7,2	10,5
Two or more chronic conditions [†]	830	7,1	5,2	3,5	7,7	2,7	1,6	4,4	5,6	3,9	8,0
Household size											
One-person household	1 888	12,1	9,6	7,7	11,8	6,6	5,0	8,7	10,4	8,4	12,7
Two-person household [†]	2 826	27,2	8,7	7,3	10,2	6,7	5,5	8,1	8,7	7,3	10,4
Three-person household	1 559	17,3	7,9	6,4	9,7	6,7	5,2	8,6	8,5	7,0	10,4
Four or more person household	3 373	43,4	12,4 [§]	11,1	13,9	11,8 [§]	10,3	13,4	12,3 [§]	10,9	13,8
Work status in the past six months[†]											
Health care worker in direct contact with others [†]	590	4,6	8,0	5,3	11,8	4,9	2,8	8,3	12,3	8,8	16,9
Other type of work in direct contact with others	3 707	32,6	14,0 [§]	12,4	15,8	12,0 [§]	10,4	13,8	13,5	11,9	15,3
Did not work, or does not work in direct contact with others	5 193	62,8	8,5	7,4	9,6	7,5 [§]	6,4	8,7	8,7	7,7	9,8
Dwelling type											
Single detached, double, row or terrace	7 451	78,4	10,0	8,3	12,0	8,2	6,7	10,0	10,4	8,7	12,3
Duplex, low- or high-rise apartment [†]	2 024	21,6	10,3	9,4	11,4	9,0	8,0	10,2	10,5	9,5	11,5

[†] respondents younger than 15 included in the "not in direct contact or did not work" category

[†] reference category

[§] indicates difference between this prevalence estimate and the estimate for the reference group is statistically different from zero at p < 0.05

Notes: "Overall" refers to the following precautions: washing hands often, masking indoors, keeping 2 metres distance, masking outdoors, avoiding large crowds, limiting contact with high risk people. "Consistently recommended" refers to the following precautions: washing hands often, masking indoors, keeping 2 metres distance. "Usually recommended" refers to the following precautions: masking outdoors, avoiding large crowds, limiting contact with high risk people. Sample counts for education, dwelling type, work status in the past six months and chronic conditions do not equal the total sample size (n = 9,646) because of non-response.

Source: Canadian COVID-19 Antibody and Health Survey, 2021.

first-level National Occupation Classification (NOC) 2016 code was “3” (health occupations), they were categorized as being in health care, in direct contact with others. If their first level NOC 2016 code was not “3,” they were categorized as being in an occupation in direct contact with others, but other than in health care. Respondents under the age of 15, those who did not work in direct contact with others, and those who did not work were combined into the final type of work category.

The presence of chronic conditions was separated into those who had none, those who had one chronic condition and those who had two or more. Respondents were asked if they had any of the following chronic conditions, which were expected to last or had already lasted six months or more and had been diagnosed by a health care professional: chronic lung condition, asthma, chronic heart disease, diabetes (excluding gestational diabetes), chronic kidney disease, liver disease, high blood pressure, chronic blood disorder, weakened immune system, chronic neurological disorder, stroke, or Alzheimer’s disease or other dementias.

Analytical techniques

Weighted prevalences of those who were less compliant to “overall,” “consistently recommended” and “usually recommended” precautions were estimated across different characteristics. Bootstrap replicate weights were used to estimate standard errors and 95% confidence intervals. Statistical testing of differences across characteristics was conducted using t-tests. Of the 11,026 respondents to the CCAHS, only those who had valid responses for all six precautions were retained for this analysis (n= 9,646).

Logistic regression models with listwise deletion (n= 329 of 9,646 were excluded) were used to predict the probability of being in the less compliant group versus being in the compliant group for overall, consistently and usually recommended precautions. Model-adjusted risk ratios (RR) and 95% confidence intervals (CI) were calculated using survey weights and survey bootstrap weights. Risk ratios greater than 1 indicate that a characteristic was associated with less compliance.

All analyses were conducted in SAS 9.4 and SAS-callable SUDAAN 11.0.3.

Results

Many characteristics were associated with being less compliant with the overall, consistently and usually recommended precautions (Table 1). Males were less compliant than females (13.8% versus 7.4% overall), as were Canadians in rural areas compared with those in urban areas (12.8% versus 9.8% overall). Canadians aged 1 to 18 (13.5%), 19 to 34 (13.6%) and 35 to 64 (8.9%) were less compliant with precautions overall than those aged 65 and older (6.2%), and Canadians with no chronic conditions were less compliant than those with two or more chronic conditions (11.4% versus 5.2% overall). Other significant differences in compliance were observed across

regions, education level, income quintiles, household size and work status.

After controlling for all characteristics, males continued to be less compliant with precautions overall than females (RR = 1.84, CI: 1.54 to 2.19) (Table 2). This was also true for both consistently recommended (RR = 1.89, CI: 1.55 to 2.31) and usually recommended (RR = 1.62, CI: 1.36 to 1.92) sets of precautions. Similarly, compared with adults aged 65 and older, people aged 18 and younger, and 19 to 34 were less compliant with precautions overall (RR = 1.78, CI: 1.16 to 2.72 and RR = 1.67, CI: 1.12 to 2.50, respectively), as well as with consistently recommended and usually recommended precautions.

Canadians in rural settings were less compliant with precautions overall (RR = 1.27, CI: 1.03 to 1.57) than those in urban settings, a pattern that held for both the consistently and usually recommended precautions. Those in the territorial capitals were less compliant with precautions overall compared with Ontario (RR = 3.11, CI: 2.38 to 4.06), while those in the Atlantic provinces were less compliant (RR = 1.30, CI: 1.03 to 1.63) with usually recommended precautions, compared with people who lived in Ontario. On the other hand, people who lived in Quebec were more compliant (RR = 0.72, CI: 0.55 to 0.95) with the consistently recommended set of precautions, compared with those who lived in Ontario.

Those with no chronic conditions were less compliant (RR = 2.49, CI: 1.34 to 4.63) with the consistently recommended COVID-19 precautions than those with two or more chronic conditions. People who worked in direct contact with others but were not in the health care industry were less compliant (RR = 2.20, CI: 1.02 to 4.74) with the consistently recommended precautions, compared with health care professionals who worked in direct contact with others.

Discussion

The present analysis found that males and those living in rural areas were less compliant with precautions. These findings are consistent with past COVID-19 research.^{5,6,7,10} Males being less compliant may be explained by a lack of confidence in their ability to comply with public health measures, and a lack of faith in those same measures during the COVID-19 pandemic.⁹ Males are also more likely to engage in risky health behaviours.¹⁷

Younger Canadians were generally found to be less compliant with precautions as well as those with no chronic conditions. These findings are generally in line with past research.^{5,6,7,10} Being at high risk for adverse COVID-19 outcomes, such as the older population and those with pre-existing chronic conditions,¹⁸ may explain why the two groups were more compliant with COVID-19 precautions—they may have been aware of their vulnerability to adverse COVID-19 outcomes.⁷

Health care professionals who worked in direct contact with others were more compliant with the consistently recommended precautions than those who worked in direct contact with others

outside of the health care industry. This was likely caused by the increased exposure risk in the work environments of health care workers, where non-compliance with the consistently recommended precautions in a health setting could lead to the spread of COVID-19 in the workplace to colleagues and patients, or at home.⁸ It is likely that their high compliance with hand washing and wearing masks indoors was the driving force for being more compliant with the consistently recommended precautions, since it may have been difficult for them to always maintain a two-metre distance from others in a health care setting.

While the present analysis found differences in compliance across regions, this can likely be attributed to differences in COVID-19 infection rates and, consequently, differences in the implementation of public health measures across regions. For example, the present analysis found Canadians in the territorial capitals to be less compliant. However, public health measures there were less restrictive than in the rest of Canada,¹ as the territories generally had smaller case counts than the provinces.¹²

Table 2
Model-adjusted risk ratios for being less compliant by selected characteristics, Canada, November 2020 to March 2021

	Overall			Consistently recommended			Usually recommended		
	Adjusted risk ratio	95% Confidence interval from	to	Adjusted risk ratio	95% Confidence interval from	to	Adjusted risk ratio	95% Confidence interval from	to
Sex									
Male	1.84	1.54	2.19	1.89	1.55	2.31	1.62	1.36	1.92
Female [†]	1.00	...	...	1.00	...	...	1.00	...	...
Region									
Atlantic	1.22	0.98	1.52	0.81	0.64	1.04	1.30	1.03	1.63
Quebec	1.06	0.85	1.34	0.72	0.55	0.95	1.14	0.91	1.44
Ontario [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Prairies	1.19	0.95	1.49	0.98	0.78	1.23	1.20	0.94	1.52
British Columbia	0.88	0.64	1.20	0.80	0.60	1.07	0.80	0.57	1.14
Territorial capitals	3.11	2.38	4.06	3.09	2.34	4.09	2.46	1.81	3.34
Rural versus urban									
Rural	1.27	1.03	1.57	1.35	1.07	1.70	1.26	1.03	1.55
Urban [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Age group									
1 to 18	1.78	1.16	2.72	1.77	1.01	3.11	1.90	1.24	2.91
19 to 34	1.67	1.12	2.50	1.56	0.91	2.67	1.91	1.29	2.83
35 to 64	1.11	0.78	1.57	0.94	0.58	1.53	1.37	0.97	1.92
65 and older [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Education									
High school education or less [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Postsecondary education	1.03	0.83	1.28	0.98	0.96	1.00	0.98	0.78	1.23
Adjusted household income quintiles									
First quintile (lowest) [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Second quintile	1.10	0.83	1.48	1.08	0.79	1.50	0.97	0.72	1.29
Third quintile	1.33	1.00	1.76	1.23	0.91	1.64	1.15	0.87	1.51
Fourth quintile	1.04	0.79	1.37	0.93	0.67	1.30	0.95	0.72	1.25
Fifth quintile (highest)	1.12	0.84	1.49	1.02	0.75	1.39	1.00	0.76	1.32
Chronic conditions									
No chronic conditions	1.50	0.94	2.37	2.49	1.34	4.63	1.38	0.91	2.09
One chronic condition	1.20	0.72	2.02	1.77	0.90	3.48	1.26	0.81	1.96
Two or more chronic conditions [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Household size									
One-person household	0.99	0.96	1.02	1.01	0.72	1.41	1.18	0.90	1.56
Two-person household [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Three-person household	1.02	1.00	1.05	0.81	0.59	1.12	0.86	0.65	1.15
Four or more person household	0.99	0.96	1.01	1.24	0.92	1.65	1.15	0.90	1.49
Work status in the past six months[‡]									
Health care worker in direct contact with others [‡]	1.00	...	...	1.00	...	...	1.00	...	...
Other type of work in direct contact with others	1.51	0.90	2.54	2.20	1.02	4.74	1.00	0.63	1.59
Did not work, or does not work in direct contact with others	0.90	0.54	1.52	1.23	0.56	2.71	0.67	0.43	1.06
Dwelling type									
Single detached, double, row or terrace	0.98	0.76	1.26	0.95	0.72	1.26	0.97	0.75	1.24
Duplex, low- or high-rise apartment [‡]	1.00	...	...	1.00	...	...	1.00	...	...

... not applicable

[†] respondents younger than 15 included in the "not in direct contact or did not work" category

[‡] reference category

Notes: "Overall" refers to the following precautions: washing hands often, masking indoors, keeping 2 metres distance, masking outdoors, avoiding large crowds, limiting contact with high risk people. "Consistently recommended" refers to the following precautions: washing hands often, masking indoors, keeping 2 metres distance. "Usually recommended" refers to the following precautions: masking outdoors, avoiding large crowds, limiting contact with high risk people.

Source: Canadian COVID-19 Antibody and Health Survey, 2021.

Strengths and limitations

The main strength of the present analysis is that it is based on a nationally representative survey of Canadians. The large sample allowed analyses to be carried out across many characteristics. In addition, the CCAHS collected data on more precautions than previous national surveys and allowed for the examination of compliance across a wide range of sociodemographic characteristics.

A limitation of the present analysis is the reference period of the data. These data reflect the COVID-19 reality in Canada during the second wave and into the third, when vaccination, previous COVID-19 infection and potential pandemic fatigue¹³ may not have been as prevalent. Another limitation is that four precautions (“work from home when possible,” “use delivery services or curbside pick-up,” “self-isolate to protect myself when concerned about exposure,” and “self-isolate to protect others after possible exposure to COVID-19”) captured in the CCAHS were excluded from the present analysis. Working from home and the two self-isolation behaviours were excluded because many respondents indicated that these behaviours were not applicable to them. Using delivery services or curbside pick-up was excluded because it was not considered a behaviour easily available to everyone, and was likely influenced by one’s location and socioeconomic status. A further limitation is that self-reporting can be problematic for measuring compliance

with public health directives because it is socially desirable to claim to follow rules,¹⁹ and therefore reported compliance may have been higher than actual compliance. Finally, it is possible that certain precautions may have been misclassified into either consistently or usually recommended owing to how quickly and differently the pandemic evolved across jurisdictions during the months of the CCAHS data collection.

Conclusion

Canadians were generally compliant with COVID-19 precautions in the earlier waves of the pandemic. However, certain characteristics were associated with being less compliant, including being male, being younger than 35 (compared with those older than 64) and living in one of the territorial capitals or in a rural area.

The continued emergence of new variants after more than two years highlights the possibility of continued waves of the pandemic, and an ongoing need for public health measures to slow the spread of the virus. Analyzing compliance with precautions remains vital. Continuing to understand which population groups are less likely to comply with precautions, and where they are located in Canada can serve to identify groups to target for policy makers and for public health messaging related to possible future waves of COVID-19, pandemics and other public health crises.

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