

## At-a-glance

# Suicidal ideation among young adults in Canada during the COVID-19 pandemic: evidence from a population-based cross-sectional study

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## Abstract

Using data from the 2020 and 2021 cycles of the Survey on COVID-19 and Mental Health, we examined suicidal ideation among adults in Canada aged 18 to 34 years. The prevalence of suicidal ideation among adults aged 18 to 34 years was 4.2% in fall 2020 and 8.0% in spring 2021. The subgroup of adults aged 18 to 24 years had the highest prevalence of suicidal ideation, 10.7%, in spring 2021. Prevalence varied by sociodemographic characteristics and tended to be higher among people living in materially deprived areas. Suicidal ideation was strongly associated with pandemic-related stressors respondents experienced.

**Keywords:** *surveillance, material deprivation, social deprivation, substance use, pandemic impacts, loneliness, anxiety, mental illness, coronavirus*

## Introduction

As early as April 2020, mental health professionals were raising concerns about the impact of the COVID-19 pandemic on suicidality.<sup>1</sup> Global suicide mortality rates remained unchanged or decreased during the first 9 to 15 months of the pandemic,<sup>2</sup> but suicidal ideation, suicide attempts and self-harm have increased in some populations and contexts.<sup>3</sup> In Canada, the prevalence of recent suicidal ideation among adults was 2.7% in 2019<sup>4,5</sup> and 2.4% in fall 2020,<sup>4</sup> increasing significantly to 4.2% in spring 2021.<sup>5</sup>

Studies suggest that young adults may have been more likely than older people to experience mental health problems such as anxiety and depressive symptoms,<sup>6</sup> loneliness,<sup>7</sup> psychological distress<sup>8</sup> and suicidality<sup>4,5,9</sup> since the start of the pandemic. In Canada in 2019, the odds of young adults aged 18 to 34 years reporting suicidal ideation were 5.4 times that of adults aged 65 years or older; these

comparative odds increased to 8.2 by fall 2020 and to 9.7 by spring 2021.<sup>4,5</sup>

Systematic reviews and meta-analyses identified pandemic-specific risk factors for suicidal ideation.<sup>3,10,11</sup> Several reviews found that university students were at high risk for suicide-related behaviours, and associated risk factors included social isolation and mental illness.<sup>11-13</sup> As the long-term mental health effects of the COVID-19 pandemic are unclear, continued surveillance is needed to inform comprehensive and effective responses to suicide risks, including among young adults.

The objectives of this paper were to (1) estimate the prevalence of suicidal ideation during the COVID-19 pandemic among young adults aged 18 to 34 years, by age subgroup; and (2) identify sociodemographic characteristics and pandemic-related stressors that may be associated with an increased risk of suicidal ideation in this population.

## Highlights

- In spring 2021, the prevalence of suicidal ideation among young adults aged 18 to 34 years was 8.0%.
- At 10.7%, the prevalence of suicidal ideation was highest in the subgroup of young adults aged 18 to 24 years, in spring 2021.
- The odds of suicidal ideation were higher among young adults who were White versus racialized, born in Canada versus immigrated to Canada, living with low or middle income, with high school education or less, or living in a materially deprived area.
- Pandemic-related experiences, stressful events and mental illness were strongly associated with suicidal ideation.

## Methods

### Data source

We analyzed cross-sectional data from the 2020 and 2021 cycles of the nationally representative, population-based Survey on COVID-19 and Mental Health (SCMH).<sup>14,15</sup> Conducted by Statistics Canada with the Public Health Agency of Canada (PHAC), the SCMH was designed to collect data to assess the impacts of COVID-19 on adults' mental health and well-being. The 2020 cycle was conducted from 11 September through 4 December 2020 ("fall 2020"), and the 2021 cycle from 1 February through 7 May 2021 ("spring 2021").

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The two SCMH cycles had nearly identical methodologies. The target population was individuals aged 18 years or older in the ten provinces and the three territorial capitals. A simple random sample of dwellings from each province and territorial capital was selected from the Dwelling Universe File, and a household member was sampled in each dwelling. Excluded from the survey were residents of institutions; of collective, unmailable, inactive or vacant dwellings; and of First Nations reserves; together, these groups represented less than 2% of the population of interest.

Respondents completed the SCMH voluntarily through an electronic questionnaire or a computer-assisted telephone interview. The response rate was 53.3% (14689 responses) for the 2020 cycle and 49.3% (8032 responses) for the 2021 cycle. A total of 18936 respondents (83.3%) agreed to share their information with PHAC. Of these respondents, 3265 were aged 18 to 34 years. After excluding 10 respondents who did not answer the question about suicidal ideation, we analyzed data from the remaining 3255 respondents.

### Measures

Suicidal ideation was determined with the question, “Have you seriously contemplated suicide since the COVID-19 pandemic began?” Sociodemographic factors examined were gender, age group, racialized group member, immigrant status, income tertile, area of residence, education,

living alone, and social and material deprivation. The social and material deprivation index developed by the Institut national de santé publique du Québec is a measure of social and material inequalities at the neighbourhood level, based on census dissemination areas.<sup>16,17</sup> The material deprivation component includes measures of area-level income, education and employment; the social deprivation component refers to social ties, that is, marital status, living alone and lone-parent family status.<sup>16,17</sup> Our analysis used the deprivation index based on the 2016 Census.

The variables for COVID-19 stressors were pandemic-related experiences; alcohol and cannabis use; concerns about violence in people’s own homes; symptoms of mental illness; ever experienced stressful events in lifetime; and work status. These variables, and the surveys, have been described in detail elsewhere.<sup>18</sup>

### Analysis

We estimated the prevalence of suicidal ideation in the 2020 and 2021 SCMH separately, by gender and by age group. We then estimated the prevalence of suicidal ideation using combined data from the two cycles, by sociodemographic characteristics and pandemic-related stressors, and used logistic regressions to examine disparities of reporting suicidal ideation. We computed crude odds ratio (OR) and adjusted odds ratios (aOR) for gender, age group and survey year. All estimates were

adjusted with sampling weights provided by Statistics Canada; 95% modified Clopper–Pearson confidence intervals (CI)<sup>19</sup> were estimated using the bootstrap technique. We conducted the analyses using SAS Enterprise Guide version 7.1 (SAS Institute, Cary, NC, USA).

### Results

Table 1 shows the prevalence of suicidal ideation, by gender and age group, in 2020 and 2021. For both cycles, this prevalence tended to be higher in younger age groups. In 2021, the prevalence of suicidal ideation among those aged 18 to 34 was 8.0%, with the highest prevalence (10.7%) among those aged 18 to 24. The prevalence of suicidal ideation was similar for women and men (7.8% versus 7.6%) in 2021. The seemingly higher prevalence among women in 2020 (5.2% versus 2.9% among men) was not statistically significant.

Table 2 shows the prevalence of and odds ratios for suicidal ideation among people aged 18 to 34 years, by sociodemographic characteristics and pandemic-related stressors, based on combined data from the 2020 and 2021 SCMH. The odds of suicidal ideation were significantly higher among people aged 18 to 24 years, those with low and middle income, those with lower educational attainment or those living in materially deprived areas. In contrast, the odds were significantly lower among racialized adults and immigrants to Canada. Young adults in the most materially deprived areas had almost double the

**TABLE 1**  
Prevalence of suicidal ideation during the COVID-19 pandemic,<sup>a</sup> by gender and age group, population aged 18–34 years, Canada

Variable	2020 <sup>a</sup>			2021 <sup>a</sup>		
	n	Prevalence, % (95% CI)	OR (95% CI)	n	Prevalence, % (95% CI)	OR (95% CI)
Overall	2096	4.2 (3.1, 5.6)	—	1159	8.0 (5.7, 10.9)	—
Gender <sup>b</sup>						
Female	1210	5.2 (3.7, 7.1)	1.8 (0.9, 3.7)	705	7.8 (4.8, 11.8)	1.0 (0.5, 2.1)
Male	869	2.9 (1.5, 5.1)	(Ref.)	448	7.6 (4.4, 12.1)	(Ref.)
Age group, years						
18–24	500	5.2 (2.9, 8.5)	1.7 (0.9, 3.4)	273	10.7 (6.0, 17.2)	1.8 (0.8, 4.0)
25–29	640	4.6 (2.7, 7.4)	1.5 (0.8, 3.0)	369	7.1 (3.3, 12.9)	1.2 (0.5, 2.9)
30–34	956	3.1 (2.0, 4.6)	(Ref.)	517	6.2 (3.6, 9.7)	(Ref.)

Sources: 2020 Survey on COVID-19 and Mental Health; 2021 Survey on COVID-19 and Mental Health.

Abbreviations: CI, confidence limit; OR, odds ratio; Ref., reference group in logistic regression.

<sup>a</sup> Data for the 2020 cycle of the Survey on COVID-19 and Mental Health were collected between 11 September and 4 December 2020, and for the 2021 cycle of the Survey on COVID-19 and Mental Health were collected between 1 February through 7 May 2021.

<sup>b</sup> Owing to the small number of samples, gender-diverse respondents were excluded from gender-stratified analyses, but were included in other analyses.

**TABLE 2**  
**Prevalence and odds ratios of suicidal ideation during the COVID-19 pandemic,<sup>a</sup> by sociodemographic characteristics and pandemic-related stressors, population aged 18–34 years, Canada**

Variable	n (%)	Prevalence, % (95% CL)	OR (95% CL)	aOR <sup>b</sup> (95% CL)
<b>Overall</b>	3255 (100.0)	6.0 (4.8, 7.5)	—	—
<b>Sociodemographic characteristics</b>				
<b>Gender<sup>c</sup></b>				
Female	1915 (50.5)	6.4 (4.8, 8.5)	1.3 (0.8, 2.2)	1.3 (0.8, 2.2)
Male	1317 (49.5)	5.1 (3.3, 7.3)	(Ref.)	(Ref.)
<b>Age group, years</b>				
18–24	773 (34.4)	7.9 (5.2, 11.3)	1.8 (1.1, 3.1)*	1.8 (1.0, 3.2)*
25–29	1009 (28.8)	5.8 (3.6, 8.8)	1.3 (0.7, 2.4)	1.2 (0.7, 2.2)
30–34	1473 (36.8)	4.5 (3.1, 6.2)	(Ref.)	(Ref.)
<b>Racialized group member<sup>d</sup></b>				
Yes	935 (36.8)	3.9 (2.4, 6.0)	0.6 (0.3, 0.9)*	0.6 (0.3, 1.0)*
No	2293 (63.2)	6.9 (5.2, 9.0)	(Ref.)	(Ref.)
<b>Immigrant status</b>				
Yes	661 (25.7)	2.7 (1.1, 5.4)	0.4 (0.2, 0.8)*	0.4 (0.2, 0.9)*
No	2588 (74.3)	7.2 (5.6, 9.0)	(Ref.)	(Ref.)
<b>Income tertile<sup>e</sup></b>				
Low	960 (30.8)	6.6 (4.5, 9.3)	2.0 (1.1, 3.9)*	1.9 (1.0, 3.7)
Middle	1006 (35.1)	6.8 (4.5, 9.8)	2.1 (1.1, 4.5)*	2.0 (1.1, 4.0)*
High	982 (34.1)	3.3 (1.9, 5.5)	(Ref.)	(Ref.)
<b>Area of residence</b>				
Population centre	2625 (87.2)	6.3 (4.9, 7.9)	1.3 (0.6, 2.8)	1.3 (0.6, 2.9)
Rural area	580 (12.8)	4.9 (2.3, 8.9)	(Ref.)	(Ref.)
<b>Educational attainment</b>				
High school or less	887 (32.8)	10.1 (7.2, 13.8)	2.7 (1.7, 4.3)***	3.0 (1.8, 5.2)***
Postsecondary	2362 (67.2)	4.0 (2.9, 5.3)	(Ref.)	(Ref.)
<b>Living alone</b>				
Yes	524 (7.9)	7.5 (5.0, 10.7)	1.3 (0.8, 2.1)	1.3 (0.8, 2.2)
No	2723 (92.1)	5.9 (4.6, 7.5)	(Ref.)	(Ref.)
<b>Have children &lt;18 years old at home</b>				
Yes	873 (21.1)	3.5 (2.2, 5.3)	0.5 (0.3, 0.9)*	0.6 (0.4, 1.2)
No	2379 (78.9)	6.7 (5.1, 8.5)	(Ref.)	(Ref.)
<b>Material deprivation<sup>f</sup></b>				
Least deprived area	1542 (42.5)	4.4 (3.1, 6.0)	(Ref.)	(Ref.)
Moderately deprived area	566 (18.1)	7.0 (4.0, 11.2)	1.6 (0.9, 3.1)	1.7 (0.9, 3.4)
Most deprived area	950 (39.4)	7.7 (5.2, 10.9)	1.8 (1.1, 3.0)*	1.8 (1.1, 3.0)*
<b>Social deprivation<sup>f</sup></b>				
Least deprived area	909 (35.6)	5.5 (3.2, 8.7)	(Ref.)	(Ref.)
Moderately deprived area	549 (16.5)	7.3 (4.0, 11.9)	1.4 (0.6, 3.0)	1.4 (0.6, 3.1)
Most deprived area	1600 (48.0)	6.3 (4.6, 8.3)	1.2 (0.6, 2.1)	1.2 (0.6, 2.1)
<b>Pandemic-related experience</b>				
<b>Loss of job/income</b>				
Yes	990 (35.5)	7.6 (5.4, 10.4)	1.5 (0.9, 2.4)	1.5 (0.9, 2.4)
No	2248 (64.5)	5.2 (3.7, 7.0)	(Ref.)	(Ref.)

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**TABLE 2 (continued)**  
**Prevalence and odds ratios of suicidal ideation during the COVID-19 pandemic,<sup>a</sup> by sociodemographic characteristics and pandemic-related stressors, population aged 18–34 years, Canada**

Variable	n (%)	Prevalence, % (95% CL)	OR (95% CL)	aOR <sup>b</sup> (95% CL)
<b>Difficulty meeting financial obligations/essentials</b>				
Yes	648 (22.0)	9.3 (6.3, 13.0)	1.9 (1.2, 3.1)*	1.9 (1.2, 3.2)*
No	2607 (78.0)	5.1 (3.8, 6.7)	(Ref.)	(Ref.)
<b>Death of family/friend/colleague</b>				
Yes	248 (8.6)	7.5 (4.1, 12.3)	1.3 (0.7, 2.4)	1.2 (0.6, 2.4)
No	2990 (91.4)	5.9 (4.6, 7.5)	(Ref.)	(Ref.)
<b>Feelings of loneliness/isolation</b>				
Yes	1846 (56.7)	10.0 (7.8, 12.5)	12.4 (6.9, 22.0)***	11.1 (6.1, 20.2)***
No	1392 (43.3)	0.9 (0.5, 1.5)	(Ref.)	(Ref.)
<b>Emotional distress</b>				
Yes	1727 (51.2)	10.4 (8.1, 13.1)	7.8 (4.0, 15.1)***	7.7 (3.7, 16.2)***
No	1511 (48.8)	1.5 (0.8, 2.6)	(Ref.)	(Ref.)
<b>Physical health problem</b>				
Yes	1059 (34.3)	11.1 (8.3, 14.5)	3.6 (2.1, 6.0)***	3.1 (1.8, 5.5)***
No	2179 (65.7)	3.4 (2.2, 5.0)	(Ref.)	(Ref.)
<b>Challenges in personal relationship</b>				
Yes	848 (26.7)	9.7 (7.0, 12.9)	2.2 (1.3, 3.5)**	2.1 (1.3, 3.5)**
No	2390 (73.3)	4.7 (3.3, 6.5)	(Ref.)	(Ref.)
<b>Number of COVID-19-related impacts experienced</b>				
0 or 1	1203 (37.3)	1.2 (0.4, 2.7)	(Ref.)	(Ref.)
2	691 (20.0)	5.1 (2.5, 9.3)	4.4 (1.4, 13.9)*	4.3 (1.3, 13.9)*
3	545 (15.4)	7.1 (3.7, 12.0)	6.2 (2.1, 18.2)***	5.2 (1.7, 16.2)**
4	423 (13.2)	10.0 (6.3, 14.9)	9.0 (3.3, 25.0)***	8.3 (2.9, 23.7)***
5+	376 (14.0)	15.3 (10.4, 21.5)	14.8 (5.5, 40.2)***	14.1 (4.8, 41.6)***
<b>Substance use</b>				
<b>Increased alcohol consumption</b>				
Yes	643 (16.6)	8.6 (5.6, 12.4)	1.6 (1.0, 2.7)	1.7 (1.0, 2.9)
No	2608 (83.4)	5.5 (4.1, 7.1)	(Ref.)	(Ref.)
<b>Ever used cannabis</b>				
Yes	1503 (41.4)	8.6 (6.5, 11.2)	2.1 (1.3, 3.6)**	2.1 (1.2, 3.5)**
No	1748 (58.6)	4.2 (2.7, 6.2)	(Ref.)	(Ref.)
<b>Increased cannabis use</b>				
Yes	377 (27.2)	11.7 (7.2, 17.6)	1.7 (0.9, 3.1)	1.6 (0.8, 2.9)
No	1129 (72.8)	7.4 (5.1, 10.3)	(Ref.)	(Ref.)
<b>Moderate or severe symptoms of mental illness</b>				
<b>Generalized anxiety disorder</b>				
Yes	687 (21.4)	15.4 (11.5, 19.9)	5.0 (3.0, 8.3)***	4.7 (2.7, 8.1)***
No	2527 (78.6)	3.5 (2.3, 5.0)	(Ref.)	(Ref.)
<b>Major depressive disorder</b>				
Yes	833 (26.9)	17.1 (13.2, 21.6)	9.4 (5.4, 16.3)***	8.5 (4.8, 15.2)***
No	2342 (73.1)	2.1 (1.3, 3.3)	(Ref.)	(Ref.)
<b>Post-traumatic stress disorder</b>				
Yes	331 (9.8)	19.7 (14.2, 26.1)	5.3 (3.2, 8.7)***	4.6 (2.6, 8.2)***
No	2836 (90.2)	4.4 (3.2, 6.0)	(Ref.)	(Ref.)

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**TABLE 2 (continued)**  
**Prevalence and odds ratios of suicidal ideation during the COVID-19 pandemic,<sup>a</sup> by sociodemographic characteristics and pandemic-related stressors, population aged 18–34 years, Canada**

Variable	n (%)	Prevalence, % (95% CI)	OR (95% CI)	aOR <sup>b</sup> (95% CI)
<b>Other factors</b>				
Experienced stressful/traumatic event during life				
Yes	1860 (54.4)	8.5 (6.6, 10.8)	2.9 (1.5, 5.6)**	2.9 (1.5, 5.6)**
No	1392 (45.6)	3.1 (1.6, 5.2)	(Ref.)	(Ref.)
Concern about violence in respondent's home				
Yes	125 (4.6)	11.4 (3.3, 26.2)	2.1 (0.6, 7.7)	2.1 (0.5, 7.9)
No	3124 (95.4)	5.8 (4.5, 7.2)	(Ref.)	(Ref.)
Work status				
Frontline worker	338 (7.9)	4.1 (1.9, 7.6)	0.6 (0.3, 1.3)	0.6 (0.3, 1.4)
Essential non-frontline worker	830 (25.2)	4.6 (2.7, 7.3)	0.7 (0.4, 1.2)	0.6 (0.4, 1.1)
Other <sup>g</sup>	2081 (67.0)	6.8 (5.1, 8.8)	(Ref.)	(Ref.)

**Sources:** 2020 Survey on COVID-19 and Mental Health; 2021 Survey on COVID-19 and Mental Health.

**Abbreviations:** CI, confidence limit; OR, odds ratio; aOR, adjusted odds ratio; SCMH, Survey on COVID-19 and Mental Health; Ref., reference group in logistic regression.

**Note:** Missing data are 9% for income, 6% for social or material deprivation and <3% for others.

<sup>a</sup> Data from the 2020 SCMH cycle, collected between 11 September and 4 December 2020, and from the 2021 SCMH, collected between 1 February and 7 May 2021, were combined.

<sup>b</sup> Logistic regression adjusted for age and survey year in analysis by gender; adjusted for gender and survey year in analysis by age group; adjusted for gender, age group and survey year in analyses for other characteristics.

<sup>c</sup> Owing to the small number of samples, gender-diverse respondents were excluded from gender-stratified analysis, but were included in other analyses.

<sup>d</sup> Racialized group members include people classified as visible minorities or who identified as Indigenous; people who identified as White were coded as non-racialized.

<sup>e</sup> Income tertile was computed based on all populations in the survey aged 18 years or over.

<sup>f</sup> Least deprived areas are those in first and second quintiles of the deprivation index; moderately deprived areas are those in the third quintile; and most deprived areas are those in fourth and fifth quintile.

<sup>g</sup> All other respondents who were not frontline or essential workers, including those who were not employed.

\*  $p < 0.05$ .

\*\*  $p < 0.005$ .

\*\*\*  $p < 0.001$ .

odds of suicidal ideation compared with those in the least deprived areas. No significant differences were observed across levels of social deprivation.

Most of the pandemic-related experiences examined were associated with higher odds of suicidal ideation, and particularly feelings of loneliness (aOR = 11.1; 95% CI: 6.1–20.2) and emotional distress (aOR = 7.7; 95% CI: 3.7–16.2). A dose-response relationship was evident; the odds of young adults with 5 or more pandemic-related experiences reporting suicidal ideation were 14 times that of the odds reported by those with 0 or 1 of these experiences.

## Discussion

Using data from the 2020 and 2021 SCMH, we analyzed suicidal ideation among young adults aged 18 to 34 years in Canada. The prevalence of suicidal ideation tended to be higher in younger age

groups and some sociodemographic subgroups. Pandemic-related stressors were associated with a higher prevalence of suicidal ideation.

In 2021 in Canada, the prevalence of suicidal ideation was 10.7% for young adults 18 to 24 years old; this was more than double the prevalence of suicidal ideation for adults overall, 4.2%.<sup>5</sup> Our findings on disparities in suicidal ideation between sociodemographic groups and associations with pandemic-related stressors experienced by young adults aged 18 to 34 are consistent with those of a recent study of adults 18 years and older.<sup>18</sup> The results also align with the findings of a United States study that reported the prevalence of seriously considering suicide in the past 30 days in June 2020 as higher among respondents aged 18 to 24 years than among older age groups, with prevalence decreasing with age.<sup>9</sup>

During the pandemic, young adults were more likely than older adults to develop

anxiety and depressive symptoms<sup>6,20-22</sup> and experience loneliness;<sup>7,23</sup> they also had the largest increase in psychological distress over time.<sup>8</sup> School and university closures may have played a role by restricting opportunities to form and maintain social relationships.<sup>24</sup> Surveys conducted in Germany found a high prevalence of suicidal ideation among university students compared with before or during the early months of the pandemic.<sup>25,26</sup> A national survey of students aged 18 to 35 years in Norway found a negative correlation between time spent in person on campus and suicidal ideation.<sup>27</sup> Job loss could also be a factor; 15- to 24-year-olds experienced unemployment more than other age groups during the pandemic.<sup>28,29</sup> Those living in the most deprived areas had high prevalence of suicidal ideation, which supports previous findings that the rise in suicidal ideation is most likely to occur among young people living in poverty.<sup>30</sup>

Our analysis used data derived from survey cycles with modest sample sizes,

which limits the statistical power needed to detect significant differences between subgroups. In addition, the cross-sectional design does not allow for examination of causal relationships. Nevertheless, the results of this study indicate that young adults in Canada had a higher risk of suicidal ideation than older adults, and that modifiable factors, including loneliness, emotional distress and symptoms of mental illness, played important roles in increasing this risk. These findings suggest that age-specific clinical and population interventions that target key risk factors may help decrease suicidal thinking among young adults during the COVID-19 pandemic.

## Acknowledgements

The editorial assistance provided by Mary Sue Devereaux is gratefully acknowledged.

## Conflicts of interest

The authors have no conflicts of interest.

## Authors' contributions and statement

All authors conceived the project. LL and GC drafted the article, and all authors contributed to its revisions. LL conducted the statistical analyses and all authors interpreted the results. All authors critically reviewed every draft of the article and approved the final submission.

The content and views expressed herein are those of the authors and do not necessarily reflect those of the Government of Canada.

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