

# PSYCHOSOCIAL IMPACTS OF THE COVID-19 PANDEMIC: RESULTS OF A BROAD INVESTIGATION IN QUÉBEC

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## BRIEF DESCRIPTION OF THE INVESTIGATION

**Context:** This is a two-year project financed by the CIHR (\$500,000) and carried out by an interdisciplinary team from the Université de Sherbrooke and other national and international partners. The Québec investigation is a supplement to this project, which is funded by the seven regional public health departments.

**Why:** Like other types of catastrophes, the pandemic is likely to trigger serious consequences in the population in the short, medium and long terms. It is important to fully grasp the nature, scope and distribution of the psychosocial impacts of the pandemic and the related risk and protection factors, to support decision making and public health interventions.

**Who:** Representative sample of 6,261 adults living in one of the seven participating social-health regions of Québec (Mauricie–Centre-du-Québec, Estrie, Montréal, Laval, Lanaudière, Laurentides, Montérégie), with a recruitment goal of 750 to 1,000 adults per region. These regions, all located in central and southern Québec, comprise just over 70% of the entire population of Québec. For information purposes, for a random sample of 6,261 participants, the margin of error is 1.24% within a confidence interval of 95% (19 times out of 20).

**Distribution of the sample**

| Region       | n           |
|--------------|-------------|
| Mauricie-CDQ | 751         |
| Estrie       | 750         |
| Montréal     | 1003        |
| Laval        | 751         |
| Lanaudière   | 1003        |
| Laurentides  | 1001        |
| Montérégie   | 1002        |
| <b>Total</b> | <b>6261</b> |

**Why:** The psychological and behavioural response during the pandemic is studied, along with its associations with various risk and protection factors, some related to communication strategies and media discourse (see themes addressed in Appendix 1). The questionnaire contains just over 80 closed questions (average completion time: 21 minutes).

**When:** The data were collected from September 4 to 14, 2020, in seven regions. This investigation follows:

- An initial investigation conducted from April 8 to 11, 2020, with 600 Canadian adults (300 in Québec)<sup>1</sup>
- A second investigation conducted from May 29 to June 12, 2020, with 1,501 Canadian adults (435 in Québec, including 321 in the seven regions that participated in the September 2020 investigation)

**How:** All the participants of this study are drawn from the Léger web panel. They were recruited using a variety of strategies (random recruitment, in social media or through campaigns or partners), in order to accurately represent the population. For maximum representativity, the data for the seven regions were weighted based on age, sex, language and region of residence.

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<sup>1</sup> The data for the April investigation were not used for comparison purposes due to the smaller number of participants.

## RESULTS OF THE INVESTIGATION

In this section, the principal results concerning the psychological and behavioural responses of the adults from the seven participating regions of Québec will be presented and discussed.

### PSYCHOLOGICAL RESPONSE

#### Prevalence

##### **In Canada and the United States (before the pandemic)**

Before the pandemic, Pelletier et al. (2017) estimated the prevalence of symptoms consistent with generalized anxiety disorder in the Canadian adult population (23,709 Canadians aged 15 and over; CCHS 2012; WHO-CIDI scale) at 2.5% in the preceding 12 months. In the United States, that proportion was estimated at 2.7% (9,282 adults; National Comorbidity Survey Replication 2001–2003; DSM-IV/WMH-CIDI scale).

Lukmanji et al. (2019) estimated the prevalence of probable major depression in youth and adults in Canada (53,000 Canadians aged 12 and over; CCHS 2015–2016; PHQ-9 scale with score  $\geq 10$ ) at 6.8%. The proportion is higher in people aged 12 to 24 than in those 25 and over (9.9% and 6.1%, respectively). In the United States, according to Shim et al. (2011), before the pandemic, 6.9% of adults reported moderate to severe symptoms of major depression (4,836 adults; National Health and Nutrition Examination Survey 2005–2008; PHQ-9 scale with score  $\geq 10$ ).

##### **In Québec (during the pandemic)**

In September 2020, in Québec, in the seven regions that participated in the investigation, one in five adults presented with a probable mental health disorder (generalized anxiety or major depression) and one in seven adults reported thoughts of death or suicidal ideation in the last two weeks. The results of the regional investigation presented in Table 1 suggest a slight reduction of the symptoms of major depression and post-traumatic stress from June to September 2020. No significant improvement was noted, however, in terms of symptoms of generalized anxiety or in terms of thoughts of death or suicidal ideation.

Using exactly the same measurement scales, there is evidence that the levels of depression in Québec are considerably higher than was observed pre-pandemic in Canada (no Québec data are available). A similar finding applies to generalized anxiety. The current levels of anxiety and depression are similar to those observed in the community of Fort McMurray six months after the devastating forest fires of 2016 (generalized anxiety: 19.8%; Agyapong et al., 2018; major depression: 14.8%; Agyapong et al., 2019).

**Table 1. Distribution of psychological response (or mental health disorders) in the adult population of the seven regions of Québec, by phase of the investigation (May 29 – June 12, 2020; September 4–14, 2020)**

| Mental health disorders  | May 29–June 12<br>(n=321) | September 4–14<br>(n=6,261) |
|--|---------------------------|-----------------------------|
| Probable generalized anxiety ( <i>GAD-7</i> $\geq 10$ ) <sup>2</sup>         | 15.6%                     | 14.6%                       |
| Probable major depression ( <i>PHQ-9</i> $\geq 10$ ) <sup>3</sup>            | 22.9%                     | 17.4% (–)                   |
| Probable generalized anxiety or major depression                             | 26.6%                     | 21.8% (–)                   |
| Thoughts of death or suicidal ideation ( <i>item 9, PHQ-9</i> ) <sup>4</sup> | 15.1%                     | 14.8%                       |
| Probable post-traumatic stress ( <i>PC-PTSD-5</i> $\geq 3$ ) <sup>5</sup>    | 19.0%                     | 14.0% (–)                   |

(–) Proportion statistically declining compared to May-June 2020 ( $p < 0.05$ )

Only the region of Montréal posted a significantly higher prevalence of mental health disorders, compared to the other regions. One in four Montréalers present with a probable mental health disorder (generalized anxiety or major depression) and one in five Montréalers has thoughts of death or suicidal ideation. In contrast, three regions (Lanaudière, Laurentides and Mauricie–Centre-du-Québec) seem to be doing better in terms of mental health during the pandemic.

**Table 2. Distribution of the psychological response (or mental health disorders) in the adult population in the seven regions of Québec (September 4–14, 2020)**

| Social-health region | Probable generalized anxiety (%) | Probable major depression (%) | Probable anxiety or depression (%) | Thoughts of death or suicidal ideation (%) |
|----------------------|----------------------------------|-------------------------------|------------------------------------|--|
| Mauricie-CDQ         | 10.1% (–)                        | 13.0% (–)                     | 15.3% (–)                          | 12.4%                                      |
| Estrie               | 14.5%                            | 15.3%                         | 20.3%                              | 13.1%                                      |
| Montréal             | 17.8% (+)                        | 21.5% (+)                     | 26.5% (+)                          | 20.1% (+)                                  |
| Laval                | 16.9%                            | 19.3%                         | 24.0%                              | 17.6%                                      |
| Lanaudière           | 11.9%                            | 12.7% (–)                     | 16.2% (–)                          | 7.4% (–)                                   |
| Laurentides          | 10.2% (–)                        | 13.8% (–)                     | 17.2% (–)                          | 9.5% (–)                                   |
| Montérégie           | 13.9%                            | 16.3%                         | 21.1%                              | 12.6% (–)                                  |

(+) Region significantly higher than the other regions ( $p < 0.05$ )

(–) Region significantly lower than the other regions ( $p < 0.05$ )

Table 3 shows that the psychological response differs greatly by sex and age; women and young adults are at higher risk of presenting with symptoms of anxiety or depression, while men are at higher risk of presenting with thoughts of death or suicidal ideation. Having children at home is only related to anxiety, while a low level of education is only related to depression. Moreover, the psychological profile of Anglophones (that is, those who chose to complete the questionnaire in English) is clearly less favourable than that of Francophones, with a risk approximately **two times higher** of presenting symptoms of anxiety, symptoms of depression or thoughts of death or suicidal ideation. Finally, essential workers, including workers in the health and social services sector, are at greater risk of presenting symptoms of anxiety or depression or thoughts of death or suicidal ideation. Symptoms of depression and thoughts of death or suicidal ideation are especially common in healthcare workers (24.5% and 20.5%, respectively).

<sup>2</sup> The GAD-7 scale (7 items) is based on the diagnostic criteria of the DSM-IV. The score for this scale is between 0 and 21. A score of 10 or higher indicates a probable generalized anxiety disorder that requires assessment by a clinician.

<sup>3</sup> The PHQ-9 scale (9 items) is based on the diagnostic criteria of the DSM-IV. The score for this scale is between 0 and 27. A score of 10 or more indicates a probable major depression that requires assessment by a clinician.

<sup>4</sup> Thoughts of death and suicidal ideation correspond to one of the nine items on the PHQ-9 scale. They are defined as the person having thought they would be better off dead or having considered hurting themselves in some way over the last two weeks.

<sup>5</sup> The PC-PTSD-5 scale (5 items) is based on the diagnostic criteria of the DSM-V. The score for this scale is between 0 and 5. A score of 3 or more indicates a probable post-traumatic stress disorder (PTSD) that requires assessment by a clinician.

**Table 3. Psychological response based on certain sociodemographic characteristics in seven regions of Québec (September 4–14, 2020)**

| Sociodemographic characteristic   | Probable generalized anxiety (%) | Probable major depression (%) | Probable anxiety or depression (%) | Thoughts of death or suicidal ideation (%) |
|-----------------------------------|----------------------------------|-------------------------------|------------------------------------|--|
| <b>Sex</b>                        |                                  |                               |                                    |  |
| Female                            | 17.3%                            | 18.5%                         | 24.3%                              | 12.6%                                      |
| Male                              | 11.6%                            | 16.2%                         | 19.0%                              | 17.0%                                      |
| <b>Age</b>                        |                                  |                               |                                    |  |
| 18–24 years old                   | 25.8%                            | 30.6%                         | 36.8%                              | 27.3%                                      |
| 25–34 years old                   | 19.5%                            | 22.5%                         | 28.1%                              | 21.4%                                      |
| 35–44 years old                   | 19.8%                            | 22.3%                         | 27.9%                              | 19.3%                                      |
| 45–64 years old                   | 12.7%                            | 16.2%                         | 20.3%                              | 14.1%                                      |
| 55–64 years old                   | 11.5%                            | 13.8%                         | 17.4%                              | 10.0%                                      |
| 65 years old or older             | 6.2%                             | 7.9%                          | 10.5%                              | 5.4%                                       |
| <b>Child(ren) at home</b>         |                                  |                               |                                    |  |
| Yes                               | 17.4%                            | 17.1% (NS)                    | 23.0% (NS)                         | 15.0% (NS)                                 |
| No                                | 13.6%                            | 17.4% (NS)                    | 21.3% (NS)                         | 14.7% (NS)                                 |
| <b>Education<sup>6</sup></b>      |                                  |                               |                                    |  |
| High school or less               | 14.2% (NS)                       | 17.7%                         | 21.8% (NS)                         | 13.6% (NS)                                 |
| College                           | 13.7% (NS)                       | 16.8%                         | 20.8% (NS)                         | 12.6% (NS)                                 |
| University                        | 12.7% (NS)                       | 14.3%                         | 18.8% (NS)                         | 13.6% (NS)                                 |
| <b>Anglophones<sup>7</sup></b>    |                                  |                               |                                    |  |
| Yes                               | 23.9%                            | 25.5%                         | 31.8%                              | 21.6%                                      |
| No                                | 11.8%                            | 14.9%                         | 18.7%                              | 12.7%                                      |
| <b>Immigrants</b>                 |                                  |                               |                                    |  |
| Yes                               | 14.4% (NS)                       | 20.4%                         | 23.4%                              | 18.9% (NS)                                 |
| No                                | 14.3% (NS)                       | 16.7%                         | 21.2%                              | 13.9% (NS)                                 |
| <b>Essential workers</b>          |                                  |                               |                                    |  |
| Yes                               | 18.4%                            | 22.4%                         | 27.2%                              | 21.1%                                      |
| No                                | 13.3%                            | 15.7%                         | 20.0%                              | 12.7%                                      |
| <b>Healthcare workers</b>         |                                  |                               |                                    |  |
| Yes                               | 19.6%                            | 24.5%                         | 29.8%                              | 20.5%                                      |
| No                                | 14.0%                            | 16.5%                         | 20.8%                              | 14.0%                                      |
| <b>At-risk groups<sup>8</sup></b> |                                  |                               |                                    |  |
| Yes                               | 12.4%                            | 16.8% (NS)                    | 20.1% (NS)                         | 13.6% (NS)                                 |
| No                                | 14.7%                            | 16.4% (NS)                    | 21.3% (NS)                         | 14.3% (NS)                                 |

NS = No significant differences among the groups ( $p \geq 0.05$ )

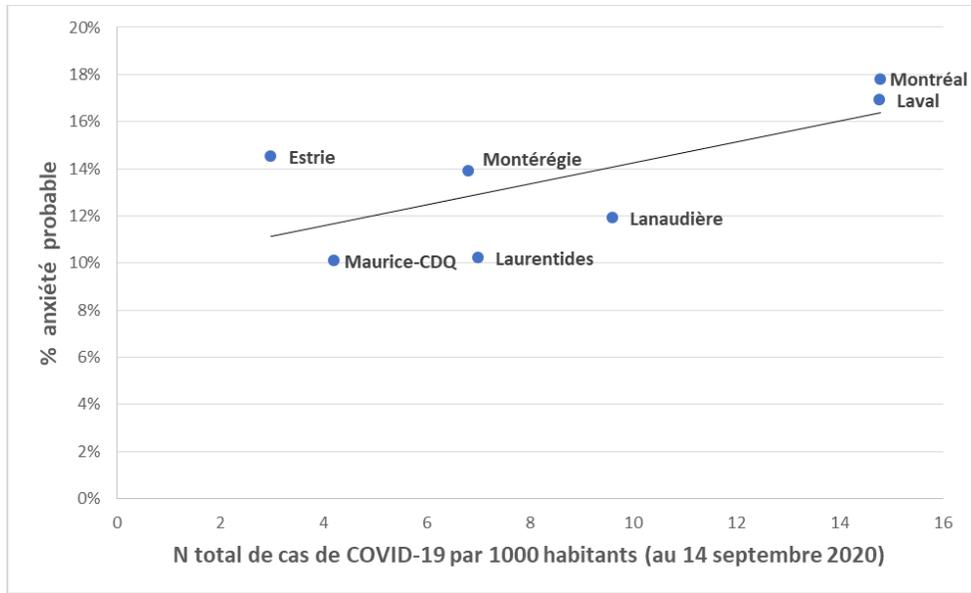
## Factors that influence the psychological response

The relationship between the number of cases of COVID-19 per 1,000 inhabitants (or cumulative incidence) and mental health disorders is clear, as shown in Figures 1a and 1b. The regions with a higher incidence of COVID-19 (especially Montréal and Laval) are also the regions with the highest prevalence of probable generalized anxiety or major depression.

<sup>6</sup> 18–24 group excluded, as studies are often underway in this age group.

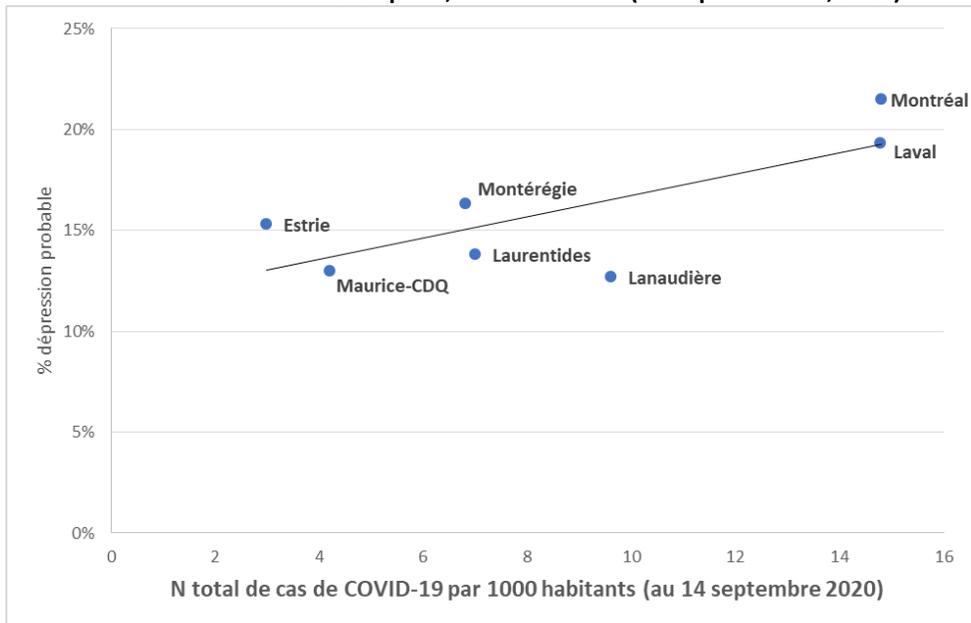
<sup>7</sup> People who chose to complete the questionnaire in English.

<sup>8</sup> People at greater risk of complications from COVID-19, including people aged 70 or over and people living with one of the following conditions: cardiac disease, hypertension, diabetes, COPD, immunosuppression.



**% probable anxiety**

**Total no. cases of COVID-19 per 1,000 inhabitants (on September 14, 2020)**



**% probable depression**

**Total no. cases of COVID-19 per 1,000 inhabitants (on September 14, 2020)**

**Figure 1. Association between the cumulative incidence of COVID-19 and a) the prevalence of probable generalized anxiety disorder and b) the prevalence of probable major depressive disorder, by region (September 4–14, 2020)**

The epidemiological situation of COVID-19 in a given region does not entirely explain the psychological response of the population, however. Other factors explain these different psychological reactions. This is what this study seeks to understand. Several risk and protection factors that may be potentially involved in the psychological response during the pandemic were examined. Their frequency in the population and development over time are presented in Table 4. Overall, there is no statistically significant difference in the frequency of these factors between June and September 2020.

**Table 4. Distribution of risk and protection factors in seven regions of Québec, by phase of the investigation (May 29–June 12, 2020; September 4–14, 2020)**

| Risk or protection factors                                       | May 29–June 12<br>(n=321) | September 4–14<br>(n=6261) |
|--|---------------------------|----------------------------|
| <b>Factors related to the pandemic</b>                           |                           |                            |
| Perception of a high threat for self/family                      | 36.7%                     | 36.3%                      |
| Perception of a high threat for country/world                    | 70.1%                     | 68.5%                      |
| Voluntary or mandatory isolation                                 | NA                        | 56.6%                      |
| Experience with COVID <sup>9</sup>                               | 12.1%                     | 14.2%                      |
| Financial losses   | 41.5%                     | 39.1%                      |
| Victim of stigmatization   | 10.6%                     | 8.5%                       |
| <b>Factors related to information</b>                            |                           |                            |
| High confidence in the government <sup>10</sup>                  | 27.7%                     | 23.5%                      |
| High confidence in national health agencies <sup>10</sup>        | 40.2%                     | 38.4%                      |
| High confidence in scientists and health experts <sup>10</sup>   | 50.3%                     | 50.1%                      |
| Median score regarding confidence in authorities <sup>11</sup>   | 32                        | 32                         |
| Use of media (television) as source of information <sup>12</sup> | 54.5%                     | 52.5%                      |
| Use of acquaintances as source of information <sup>12</sup>      | 27.5%                     | 29.6%                      |
| Use of social networks as source of information <sup>12</sup>    | 20.3%                     | 19.6%                      |
| Use of the Internet as source of information <sup>12</sup>       | 12.1%                     | 14.5%                      |
| Use of online sources of information <sup>12,13</sup>            | 24.7%                     | 25.9%                      |
| Median score regarding erroneous beliefs <sup>14</sup>           | 35                        | 32                         |
| <b>Individual psychological resources</b>                        |                           |                            |
| High sense of coherence <sup>15</sup>                            | 40.4%                     | 44.0%                      |

NA=Not available because the formulation of the question was changed between the two phases of the investigation.

The principal factors associated with generalized anxiety, major depression or thoughts of death or suicidal ideation are presented in Table 5. The five principal stressors for generalized anxiety and major depression are, in decreasing order:

1. Low sense of coherence (3–4 times more risk)
2. High level of erroneous beliefs (2–3 times more risk)
3. Being a victim of stigmatization (2 times more risk)
4. Low level of confidence in the authorities (2 times more risk)
5. Perception of a high threat for self or family (2 times more risk)

With regard to thoughts of death or suicidal ideation, four of the five principal stressors are the same, but the use of the Internet as a regular source of information replaces the perception of a high threat for self or family. There is

<sup>9</sup> Person who had to isolate due to symptoms or contact with a case of COVID-19 or those diagnosed with COVID-19.

<sup>10</sup> Confidence level of 9 or 10 on a scale of 0 to 10

<sup>11</sup> The score for confidence in authorities ranges from 4 to 40 and depends on the level of confidence in four types of authorities (government, international health agencies, national health agencies, health experts). The level of agreement is measured using a scale ranging from 1 (very low) to 10 (very high). For the remainder of the analyses, the total score was converted into quartiles (Q1 = low level, Q4 = high level).

<sup>12</sup> Source used often or always for information about the coronavirus.

<sup>13</sup> Social networks or the Internet (other than online newspapers).

<sup>14</sup> The score for erroneous beliefs ranges from 12 to 120 and is based on the level of agreement with twelve erroneous statements (see Appendix 2). The level of agreement is measured using a scale ranging from 1 (complete disagreement) to 10 (complete agreement). For the remainder of the analyses, the total score was converted into quartiles (Q1 = low level, Q4 = high level).

<sup>15</sup> The SOC-3 scale (3 items) relies on three questions that each target one of the three components of sense of coherence (comprehensibility, meaningfulness and manageability). A score from 0 to 6 is possible. A score of 4 or more indicates a high sense of coherence. The three questions are as follows:

1. Do you usually feel that the things that happen to you in your daily life are hard to understand? (comprehensibility)
2. Do you usually feel that your daily life is a source of personal satisfaction? (meaningfulness)
3. Do you usually see a solution to problems and difficulties that other people find hopeless? (manageability)

also evidence that erroneous beliefs and a low sense of coherence strongly influence the presence of suicidal ideation during the pandemic (four and five times more risk, respectively).

**Table 5. Association between psychological response and risk and protection factors in seven regions of Québec (September 4–14, 2020)<sup>16</sup>**

| Risk or protection factors                               | Influence on the risk of generalized anxiety (ratio) | Influence on the risk of major depression (ratio) | Influence on the risk of thoughts of death or suicidal ideation (ratio) |
|--|--|---|---|
| <b>Factors related to the pandemic</b>                   |  |   |   |
| Perception of a high threat for self/family              | 2.14   | 1.83  | 1.33  |
| Perception of a high threat for country/world            | 1.46   | 1.26  | 0.84  |
| Voluntary or mandatory isolation                         | 1.47   | 1.55  | 1.38  |
| Experience with COVID                                    | 1.75   | 1.73  | 1.98  |
| Financial losses   | 1.94   | 1.64  | 1.67  |
| Victim of stigmatization                                 | 2.16   | 2.14  | 3.06  |
| <b>Factor related to information</b>                     |  |   |   |
| Low score regarding confidence in authorities (Q1 v. Q4) | 2.17   | 1.87  | 2.28  |
| Use of acquaintances as source of information            | 1.22   | 1.18  | 1.28  |
| Use of social networks as source of information          | 1.69   | 1.62  | 2.06  |
| Use of the Internet as source of information             | 1.59   | 1.82  | 2.32  |
| Use of online sources of information                     | 1.75   | 1.71  | 2.12  |
| High score regarding erroneous beliefs (Q4 v. Q1)        | 2.23   | 2.46  | 4.53  |
| <b>Individual psychological resources</b>                |  |   |   |
| Low sense of coherence                                   | 3.16   | 3.97  | 5.07  |

Note: The ratio corresponds to the prevalence of each mental health disorder in people with a risk factor compared to those without one.

## Sense of coherence and erroneous beliefs about the coronavirus

Sense of coherence (SoC) is the capacity to understand, make meaning of and deal with a stressful event. The higher a person's SoC, the greater their capacity to handle adversity. Of all the factors examined in this study, SoC is by far the one most strongly linked to psychological health during the pandemic.

Here are the data found in the seven regions:

- Generalized anxiety: 6.6% in people with a high SoC vs. 20.9% in those with a low SoC
- Major depression: 6.5% in people with a high SoC vs. 25.8% in those with a low SoC
- Thoughts of death or suicidal ideation: 4.5% in people with a high SoC vs. 22.8% in those with a low SoC

People with a high SoC have **four and five times less risk** of presenting with a major depression and thoughts of death or suicidal ideation, respectively, than those with a low SoC.

To better explain the role of SoC in the internalization of information conveyed over various channels (traditional, digital, interpersonal) about the coronavirus, an erroneous belief score was created, based on the level of agreement with 12 erroneous statements (see Appendix 2). It shows that a high SoC is closely related with a lower propensity to have erroneous beliefs about the coronavirus:

- High erroneous belief score (Q4): 31.6% in people with a low SoC vs. 16.1% in those with a high SoC
- Low erroneous belief score (Q1): 18.2% in people with a low SoC vs. 32.5% in those with a high SoC

<sup>16</sup> Only the factors with a statistically significant association were retained ( $p < 0.05$ ).

It may even partly be through this mechanism that a high SoC plays a protective role for mental health. Table 6 suggests that the higher the level of erroneous beliefs, the greater the risk of having symptoms compatible with generalized anxiety or major depression.

**Table 6. Psychological response (or mental health disorders) by level of erroneous beliefs in seven regions of Québec (September 4–14, 2020) (differences all statistically significant)**

|                               | Probable generalized anxiety (%) | Probable major depression (%) | Thoughts of death or suicidal ideation (%) |
|-------------------------------|----------------------------------|-------------------------------|--|
| <b>Erroneous belief score</b> |                                  |                               |  |
| Quartile 1 (low)              | 9.9%                             | 11.4%                         | 7.0%                                       |
| Quartile 2                    | 11.2%                            | 13.3%                         | 8.7%                                       |
| Quartile 3                    | 15.4%                            | 16.8%                         | 11.9%                                      |
| Quartile 4 (high)             | 22.1%                            | 28.1%                         | 31.7%                                      |

About four adults in ten (44.0%) and a proportion of adults ranging from 39.3% (Montréal) to 51.5% (Laurentides) have a high SoC, in the regions studied. This “capacity to adapt to stress” is therefore not uniformly distributed among the various social groups, with older adults and more educated people presenting higher proportions of high SoC (see Table 7). It is also evident that many social groups with a lower SoC report more erroneous beliefs.

**Table 7. Sense of coherence and erroneous beliefs, by sociodemographic characteristics in seven regions of Québec (September 4–14, 2020)**

| Sociodemographic characteristics | High sense of coherence | High erroneous belief score |
|----------------------------------|-------------------------|-----------------------------|
| <b>Sex</b>                       |                         |                             |
| Female                           | 43.4% (NS)              | 23.1%                       |
| Male                             | 44.7% (NS)              | 26.1%                       |
| <b>Age</b>                       |                         |                             |
| 18–24 years old                  | 26.8%                   | 36.7%                       |
| 25–34 years old                  | 40.0%                   | 28.7%                       |
| 35–44 years old                  | 39.6%                   | 30.6%                       |
| 45–54 years old                  | 42.2%                   | 27.9%                       |
| 55–64 years old                  | 49.3%                   | 20.7%                       |
| 65 years old or over             | 54.8%                   | 13.0%                       |
| <b>Education</b>                 |                         |                             |
| High school or less              | 36.8%                   | 32.4%                       |
| College                          | 45.0%                   | 26.0%                       |
| University                       | 51.2%                   | 17.2%                       |
| <b>Anglophones</b>               |                         |                             |
| Yes                              | 37.1%                   | 35.4%                       |
| No                               | 46.1%                   | 21.5%                       |
| <b>Immigrants</b>                |                         |                             |
| Yes                              | 35.1%                   | 35.5%                       |
| No                               | 45.4%                   | 22.9%                       |
| <b>Essential workers</b>         |                         |                             |
| Yes                              | 42.6% (NS)              | 32.8%                       |
| No                               | 44.7% (NS)              | 22.1%                       |
| <b>Healthcare workers</b>        |                         |                             |
| Yes                              | 43.4% (NS)              | 33.3%                       |
| No                               | 44.1% (NS)              | 24.0%                       |
| <b>At-risk groups</b>            |                         |                             |
| Yes                              | 45.4% (NS)              | 21.9%                       |
| No                               | 44.2% (NS)              | 24.8%                       |
| <b>Total</b>                     | <b>44,0%</b>            | <b>24.7%</b>                |

NS = No significant difference among the groups ( $p \geq 0.05$ )

## Considerations regarding psychological response

The first observations seem to suggest a relationship between SoC, erroneous beliefs and psychological health in a pandemic situation, which could be conceptualized as follows.



In addition to having an influence on erroneous beliefs that fosters an adverse psychological response, SoC may influence other psychological or behaviour issues that may also increase the risk of developing a psychological disorder, as SoC influences health through a variety of mechanisms (Super et al., 2016):

- First, it favourably influences our assessment of a stressful situation (causes, effects, actions to take), thereby reducing its emotional impact.
- It also positively influences our perception of a situation so we can view it as less serious and less stressful.
- Finally, it favourably influences our actions by allowing us to choose the appropriate adaptation strategies and use more of the resources at our disposal to compensate for the stressors we are exposed to.

Since SoC turns out to be a key protective factor associated with better psychological health during a pandemic, additional work is required to better understand its relationships with other stressors and to develop and assess ways to reinforce it.

## At-risk groups

Stigmatization, which affects nearly one in ten people in Québec, doubles the risk of depression and triples the risk of thoughts of death or suicidal ideation. But who are these people who say they have been stigmatized during the pandemic? Stigmatization was cited more often by people in the following groups (significantly so):

- People who received a COVID-19 diagnosis: 32.1% (vs. 7.8% of others)
- People who had to isolate due to contact with a case of COVID-19: 19.9% (vs. 7.6% of others)
- People who had to isolate due to symptoms of COVID-19: 15.1% (vs. 7.8% of others)
- People aged 18 to 24: 16.3% (vs. 7.7% of others)
- People who work in the health or social services sector: 13.9% (vs. 8.0% of others)
- Immigrants: 12.9% (vs. 8.0% of others), especially those from Asia (24.4%)
- Anglophones: 12.1% (vs. 7.5% of others)
- People living in Montréal: 11.1% (vs. 7.2% others)

Moreover, supplemental analyses reveal that, compared to other adults, young adults (18–24 years old) and Anglophones more directly experienced the impacts of the pandemic (e.g., isolation), felt they were more stigmatized, have a lower level of confidence in the authorities, do not use the same sources of information (e.g., greater use of acquaintances and social networks), have more erroneous beliefs and have a lower sense of coherence. These differences seem to explain the differences observed in their psychological health.

## BEHAVIOURAL RESPONSE

### Consumption of alcohol and cannabis

Behavioural response may take the form of stress management strategies that are sometimes appropriate (e.g., physical activity) and sometimes less appropriate (e.g., consumption of alcohol or cannabis). The consumption of alcohol seems to have been chosen as a stress management strategy by a great many Québécois, as shown by the data presented in Table 8. There are no significant differences between the levels observed in May–June and September 2020 in the seven participating regions, which suggests that the adoption of these behaviours continued through this period.

**Table 8. Behavioural response (or stress management strategies) of the adult population in seven regions of Québec, by phase of the investigation (May 29–June 12, 2020; September 4–14, 2020)**

| Stress management strategies | May 29–June 12 (n=321) | September 4–14 (n=6261) |
|------------------------------|------------------------|-------------------------|
| Alcohol consumption          | 38.0%                  | 41.6%                   |
| Cannabis consumption         | 15.5%                  | 12.0%                   |

This behavioural response varies somewhat among the regions, with stress management using cannabis more frequent in Montréal (Table 9). These data do not allow us to conclude that the behaviours are problematic, however, as neither the quantity nor the frequency of consumption were examined for this investigation.

**Table 9. Behavioural response (or stress management strategies) of the adult population in seven regions of Québec, by region studied (September 4–14, 2020)**

| Social health region | Alcohol consumption (%) | Cannabis consumption (%) |
|----------------------|-------------------------|--------------------------|
| Mauricie-CDQ         | 39.1%                   | 9.3%                     |
| Estrie               | 40.3%                   | 10.3%                    |
| Montréal             | 42.0%                   | 16.2% (+)                |
| Laval                | 34.4% (–)               | 11.2%                    |
| Lanaudière           | 44.3%                   | 8.6% (–)                 |
| Laurentides          | 44.5%                   | 9.4% (–)                 |
| Montérégie           | 42.2%                   | 10.4% (–)                |

(+) Region significantly higher than the other regions ( $p < 0.05$ )

(–) Region significantly lower than the other regions ( $p < 0.05$ )

### Inclination to receive vaccination

Despite the fear and disruptions the pandemic has caused in the public, only two-thirds of the adults surveyed in the seven regions of Québec are prepared to take an approved COVID-19 vaccine; 16% would refuse it and 19% would hesitate to take it. It is worth noting that for regular childhood vaccinations, fewer than 5% of parents refuse to have their children receive the recommended vaccinations, while about one-third hesitate to have their children take them (Guay et al., 2019; Kiely et al., 2016). Another phenomenon of interest: between May–June and September

2020, there was a significant increase in the proportion of adults who would refuse to take an approved COVID-19 vaccine (see Table 10).

**Table 10. Inclination to receive an approved COVID-19 vaccine among the adult population of seven regions of Québec, by phase of the investigation (May 29–June 12, 2020; September 4–14, 2020)**

| Inclination to receive the vaccine | May 29–June 12<br>(n=321) | September 4–14<br>(n=6261) |
|------------------------------------|---------------------------|----------------------------|
| Accept                             | 69.6%                     | 65.2%                      |
| Refuse                             | 11.8%                     | 15.6% (+)                  |
| Hesitate <sup>17</sup>             | 18.7%                     | 19.1%                      |

(+) Proportion significantly higher than in May-June 2020 ( $p < 0.05$ )

The data presented in Table 11 show a large difference in the inclination to receive the vaccination in the regions studied, with the regions of Estrie and Mauricie-Centre-du-Québec noticeably set apart.

**Table 11. Inclination to receive an approved COVID-19 vaccine among the adult population of seven regions of Québec, by region studied (September 4–14, 2020)**

| Social health region | Accept (%) | Refuse (%) | Hesitate (%) |
|----------------------|------------|------------|--------------|
| Mauricie-CDQ         | 60.1% (-)  | 18.9% (+)  | 21.0%        |
| Estrie               | 60.7% (-)  | 18.3%      | 21.1%        |
| Montréal             | 64.2%      | 14.5%      | 21.3% (+)    |
| Laval                | 62.4%      | 17.6%      | 20.1%        |
| Lanaudière           | 65.1%      | 16.5%      | 18.4%        |
| Laurentides          | 64.8%      | 18.7% (+)  | 16.5%        |
| Montérégie           | 71.4% (+)  | 12.9% (-)  | 15.8% (-)    |

(+) Region significantly higher than the others

(-) Region significantly lower than the others

We can see in Table 12 that the sociodemographic characteristics associated with refusing or hesitating to take the vaccine are approximately the same as those associated with anxiety, depression and thoughts of death or suicidal ideation (e.g., young adults). It is also notable that many healthcare workers do not wish to receive the COVID-19 vaccine (18.1%) or hesitate to receive it (19.6%).

<sup>17</sup> Uncertain or prefer not to answer.

**Table 12. Sociodemographic characteristics associated with the inclination to receive an approved COVID-19 vaccine in seven regions of Québec (September 4–14, 2020)**

| Sociodemographic characteristics | Accept (%) | Refuse (%) | Hesitate (%) |
|----------------------------------|------------|------------|--------------|
| <b>Sex</b>                       |            |            |              |
| Female                           | 61.5%      | 16.2% (NS) | 22.3%        |
| Male                             | 69.4%      | 14.8% (NS) | 15.7%        |
| <b>Age</b>                       |            |            |              |
| 18–24 years old                  | 61.3%      | 17.8%      | 20.9%        |
| 25–34 years old                  | 58.0%      | 21.2%      | 20.8%        |
| 35–44 years old                  | 60.4%      | 17.8%      | 21.9%        |
| 45–54 years old                  | 58.6%      | 19.7%      | 21.7%        |
| 55–64 years old                  | 67.6%      | 13.4%      | 19.0%        |
| 65 years old and older           | 79.1%      | 7.6%       | 13.3%        |
| <b>Child(ren) at home</b>        |            |            |              |
| Yes                              | 61.0%      | 18.2%      | 20.8%        |
| No                               | 66.8%      | 14.6%      | 18.5%        |
| <b>Education</b>                 |            |            |              |
| High school or less              | 59.6%      | 20.9%      | 19.6%        |
| College                          | 63.4%      | 15.6%      | 21.0%        |
| University                       | 70.5%      | 12.8%      | 16.7%        |
| <b>Anglophones</b>               |            |            |              |
| Yes                              | 61.1%      | 15.8% (NS) | 23.1%        |
| No                               | 66.5%      | 15.5% (NS) | 17.9%        |
| <b>Immigrants</b>                |            |            |              |
| Yes                              | 53.9%      | 22.6%      | 23.4%        |
| No                               | 67.0%      | 14.6%      | 18.5%        |
| <b>Essential workers</b>         |            |            |              |
| Yes                              | 62.0%      | 18.7%      | 19.3% (NS)   |
| No                               | 66.5%      | 14.7%      | 18.8% (NS)   |
| <b>Healthcare workers</b>        |            |            |              |
| Yes                              | 62.4% (NS) | 18.1% (NS) | 19.6% (NS)   |
| No                               | 65.5% (NS) | 15.4% (NS) | 19.1% (NS)   |
| <b>At-risk groups</b>            |            |            |              |
| Yes                              | 72.9%      | 10.9%      | 16.2%        |
| No                               | 60.9%      | 18.4%      | 20.7%        |

NS = Lack of significant differences among the groups ( $p \geq 0.05$ )

It is also interesting to note that the factors associated with refusing or hesitating to take the COVID-19 vaccine are similar to the factors associated with psychological health problems.

**People who would refuse to receive an approved vaccine are more often:**

- Women: 53.9% (vs. 48.7% of those who would accept)
- Adults aged 25–54: 63.0% (vs. 45.5% of those who would accept)
- People with a high school education: 29.3% (vs. 19.5% of those who would accept)
- People at low risk:<sup>18</sup> 71.2% (vs. 55.0% of those who would accept)
- People who do not perceive a high threat for themselves or their family: 77.1% (vs. 60.3% of those who would accept) or for their country/the world: 50.2% (vs. 26.6% of those who would accept)
- People with little confidence in the authorities: 55.6% (vs. 15.4% of those who would accept)
- People with a lot of erroneous beliefs: 52.1% (vs. 15.9% of those who would accept)
- People who get more of their information online:<sup>19</sup> 34.2% (vs. 23.9% of those who would accept)
- People with a low SoC: 61.1% (vs. 53.9% of those who would accept)

<sup>18</sup> People not in one of the groups at risk of COVID-19 complications

<sup>19</sup> Social networks or the Internet (other than online newspapers)

## WHAT TO RETAIN: HIGHLIGHTS

- 1) Anxiety, depression and thoughts of death (or suicidal ideation) affect many Québécois, and one adult in five appears to have had symptoms compatible with generalized anxiety disorder or major depression and one adult in seven, thoughts of death or suicidal ideation in the last two weeks.
- 2) The situation seems to be of even greater concern in urban areas, especially Montréal, where one adult in four appears to have had symptoms compatible with generalized anxiety disorder or major depression and one adult in five, thoughts of death or suicidal ideation in the last two weeks.
- 3) In all the regions studied, anxiety or depression affects certain groups more, particularly adults aged 18–24 (37%), Anglophones (32%) and healthcare workers (30%).
- 4) Several stressors appear to be exacerbating mental health disorders during the pandemic, the principal ones being (in order of importance) 1–having a low sense of coherence, 2–having a high level of false beliefs, 3–being a victim of stigmatization, 4–having a low level of confidence in the authorities, 5–perceiving COVID-19 as a high threat for self or family, and 6–regularly using the Internet as a source of information about the coronavirus.
- 5) Sense of coherence, which is our capacity to understand, manage and make meaning of stressful events, is by far the factor most strongly linked to psychological health during the pandemic. Québécois who have a high sense of coherence are four times less at risk of major depression and five times less at risk of having thoughts of death or suicidal ideation.
- 6) Sense of coherence plays a role in the way people internalize information about the coronavirus that is conveyed through various communications channels. People with a low sense of coherence are twice as likely to have false beliefs, which feeds their anxiety and depression.
- 7) Stigmatization currently affects nearly one adult in ten. The principal victims of stigmatization are people who have had COVID-19 or have had to isolate due to symptoms or contact with a case of COVID-19, young adults, healthcare workers, Anglophones, immigrants (especially those of Asian origin) and Montréalais. Stigmatization doubles the risk of anxiety or depression and triples the risk of thoughts of death or suicidal ideation.
- 8) The psychologically disadvantageous situation of young adults and Anglophones seems to be explained primarily by greater direct repercussions of the pandemic (e.g., isolation), more stigmatization, greater distrust in the authorities, the use of different sources of information (e.g., acquaintances, social networks), more false beliefs and a lower sense of coherence.
- 9) At present, only two adults in three are prepared to receive an approved COVID-19 vaccine, while 16% would refuse it and 19% would hesitate to receive it. The proportion of refusal is higher since the beginning of summer and is clearly higher than that observed for early childhood vaccinations (less than 5%).
- 10) The factors associated with mental health disorders during the pandemic are practically the same as those associated with the refusal to be vaccinated. These stressors may ultimately become detrimental to physical health as well as mental health.

## COURSES OF ACTION

**Overall, in strategies to counter the COVID-19 pandemic, it is important to seek balance between biological risks and psychosocial risks.** Moreover, as suggested by the INSPQ in its recent publication on resilience and social cohesion during the pandemic (Roberge et al., 2020), a multi-prong intervention model should be adopted, in every community in Québec. This model proposes the four following prongs:

- 1) **Specialized psychiatry services:** Interdisciplinary teams specialized in mental health and dependence (e.g., doctors, nurses, psychologists, social workers) that are accessible and equipped to deal with the specific context of the pandemic.
- 2) **Frontline services:**
  - a. Frontline mental health and dependence workers accessible in both the clinical and community setting (that is, outreach intervention) and equipped to deal with the specific context of the pandemic.
  - b. Social prescription to break isolation (that is, a doctor's prescription to take an outdoor yoga class, do a volunteer activity, etc.).<sup>20</sup>
  - c. A sentinel network of citizens trained in psychological first aid<sup>21</sup> to identify, initiate the care of and refer people at higher risk to qualified resources.
- 3) **Reinforcement of community support:**<sup>22</sup>
  - a. The creation of favourable social environments in each of the 87 RCMs and the 14 cities/agglomerations in Québec, drawing on local leadership, networking, collaboration, citizen participation and innovation.
  - b. Practical actions to reinforce sense of coherence, particularly through individual or group interventions based in sports and recreation, artistic and cultural activities, meditation and mindfulness or self-expression (Généreux et al., in press).
  - c. Support for essential workers, especially healthcare workers.
- 4) **Inclusion of psychosocial needs in basic services** (*mental health in all policies*):
  - a. Mechanisms in place to meet the social needs of people and communities (e.g., food security, housing, child protection, grief support).
  - b. National and regional communications strategies:
    - i. To promote a health lifestyle (healthy diet, physical activity, screen time, adequate sleep, low-risk alcohol consumption)
    - ii. To promote mental health and self-care in order to maintain, reinforce or improve psychological wellness
    - iii. To reduce stigmatization, distrust, erroneous beliefs and fear
    - iv. To more effectively reach certain at-risk groups (e.g., young adults, Anglophones), particularly through a strong digital strategy

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<sup>20</sup> For more details on social prescription: <https://www.kingsfund.org.uk/publications/social-prescribing>

<sup>21</sup> Training modules available at: <https://santemontreal.qc.ca/en/professionnels/drsp/sujets-de-a-a-z/coronavirus-sars-cov-2-ou-covid-19/maladie-a-coronavirus-copie-1/#c45036>

<sup>22</sup> By way of reference, the outreach team set up in the RCM of Granit after the rail tragedy in July 2013 in Lac-Mégantic (Généreux et al., 2020) had a recurring annual budget of \$250,000. To allocate such a budget to each RCM or city/agglomeration in Québec, an annual provincial budget of \$25,250,000 would be required.

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# APPENDIX 1

List of themes addressed in the questionnaire for the investigation conducted in seven regions of Québec:

## **Psychological health**

- Level of daily stress
- Sleep problems in the last two weeks
- Probable generalized anxiety disorder (based on 7 items)
- Probable major depressive episode (based on 9 items)
- Probable post-traumatic stress disorder (based on 5 items)
- Thoughts of death or suicidal ideation in last two weeks

## **Stress management strategies used during the pandemic**

- Positive: new hobby, reading, meditation, singing or music, social contact on digital platforms, physical activity, healthy meals
- Negative: consumption of alcohol or cannabis

## **Sociodemographic characteristics**

- Age, sex and level of education
- Composition of household
- Chronic diseases
- Immigrant status (with continent of origin)
- Language spoken
- Being an essential worker
- Being a health and social services worker

## **Risk or protection factors**

- Perceived threat level for self, family, country and world
- COVID-19 experience (diagnosis, symptoms without diagnosis, contact with a case)
- Voluntary isolation or quarantine
- Financial losses due to the pandemic
- Being a victim of stigmatization due to the pandemic
- Level of confidence in the government, the health authorities and health experts
- Level of information available on the subject of the coronavirus
- Source of information used (traditional media, acquaintances, social networks, Internet)
- Level of erroneous beliefs about COVID-19 (based on 12 items)
- Sense of coherence (based on 3 items)

## APPENDIX 2

The twelve statements considered erroneous used as the basis for calculating the erroneous belief score:

1. I think that my government is hiding important information about the coronavirus.
2. I think that the coronavirus was intentionally developed in a laboratory.
3. I think that the coronavirus was unintentionally developed in a laboratory.
4. I think that the pharmaceutical industry is involved in the propagation of the coronavirus.
5. I think that there is already a drug to prevent or treat the coronavirus.
6. I think that once you catch the novel coronavirus, you have it for the rest of your life.
7. I think that there is a connection between 5G technology and the coronavirus.
8. I think that the coronavirus is not transmitted in hot countries.
9. I think that the coronavirus is no more dangerous than the seasonal flu (influenza).
10. I think that the sun or temperatures above 25 degrees Celsius can prevent the coronavirus (COVID-19).
11. I think that the novel coronavirus can be spread by mosquito bites.
12. I think that spraying alcohol or bleach on my entire body will kill the novel coronavirus.