International COVID-19 Awareness and Responses Evaluation Study (The iCARE Study): Leveraging an international perspective to better understand COVID-19

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www.iCAREstudy.com
The key to tackling the spread of COVID-19 is adherence to behaviour-based, public health policies (including vaccinations). However, adherence to many policies comes with significant personal, social and economic costs that may undermine adherence. Understanding the determinants of adherence may help inform policy and communication strategies around the world.
The iCARE study

• Core questions:
  • What are the sociodemographic, psychological, behavioural, physical/mental health, and economic determinants of COVID-19-related policy adherence?
  • Which policies, launched where, when, and for whom, are most (and least) associated with adherence and most (and least) effective at reducing infection rates and mortality?

• Main objective:
  • To provide data-driven recommendations to local and international governments on how to optimise policy and communication strategies to improve policy adherence and health, economic, and quality of life outcomes associated with COVID-19
Collaborators/partners

• **Collaborator information:**
  • 200 international collaborators
  • 41 countries
  • Survey is available in 34 languages

• **New collaborators/partners:**
  • Always open to new collaborators and partners
Structure of the study

• Four main components
  • Survey
  • John Hopkins cases data
  • Oxford Policy data
  • Google mobility data
The Survey

• Ongoing, multi-wave Canadian-led international cross-sectional survey* on public awareness, attitudes, concerns and behavioural responses to COVID-19 public health policies

• Includes:
  • A global convenience sample (snowball sampling)
  • Representative sampling in various countries (e.g., Canada, UK, Ireland, Australia)
  • *Canadian longitudinal study
  • All continents
The Survey

- Theoretical Frameworks
  - COM-B and Health Beliefs Model
- Components
  - Socio-demographics
  - Health status and health behaviors
  - Awareness of local public health policies and perceptions of government responses
  - Sources of COVID-19 information
  - Adherence to public health policy measures and behavioral intentions
  - COVID-19-related concerns
  - Use of apps for contact tracing
  - COVID-19 vaccine confidence
  - COVID-19-related impacts (health, mental health, social, work, economic, back to school)
iCARE and COM-B

- Health condition
  - Physical capability
  - Psychological capability
- Awareness
  - Reflective motivation
  - Automatic motivation
- Motivators/concerns
- Impact (emotions)
  - Physical opportunity
  - Social opportunity
- Socio-demogs. (job sector, ins)
- Gov’t policies, info sources

CAPABILITY
  Improves ability to change

MOTIVATION
  Increases desire to change

BEHAVIOUR
  Outcome of importance

Behaviours
iCARE Study Timeline:
Global surveys & representative samples

1) March 27 - May 5 2020
2) May 5 - June 8 2020
3) June 8 - July 22 2020
4) July 22 - Sept 15 2020
5) Sept 15 - Nov 3 2020
6) Nov 3 - Dec 16 2020
7) Dec 16 2020 - Feb 9 2021
8) Feb 9 - March 23 2021
9) March 23 - May 4 2021
10) May 4 - June 15 2021
11) June 15 - July 27 2021
12) July 27 - Sept 7 2021
13) Sept 7 - Oct 19 2021
14) Oct 19 - Nov 30 2021
15) Nov 30 2021 - Jan 11 2022

Green = completed
Blue = coming up
## Where we are at:

<table>
<thead>
<tr>
<th>Survey version</th>
<th>Convenience Sample</th>
<th>Representative Samples</th>
<th>Countries</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey 1 (March 27 – May 5)</td>
<td>28,651</td>
<td>4844</td>
<td>136</td>
<td>33,495</td>
</tr>
<tr>
<td>Survey 2 (May 5 – June 8)</td>
<td>12,845</td>
<td>4010</td>
<td>123</td>
<td>16,855</td>
</tr>
<tr>
<td>Survey 3 (June 8 – July 22)</td>
<td>7654</td>
<td>1000</td>
<td>98</td>
<td>8654</td>
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<tr>
<td>Survey 4 (July 22 – Sept 15)</td>
<td>4102</td>
<td>N/A</td>
<td>81</td>
<td>4102</td>
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<td>Survey 5 (Sept 15 – Nov 3)</td>
<td>3404</td>
<td>3005</td>
<td>87</td>
<td>6409</td>
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<tr>
<td>Survey 6 (Nov 3 – Dec 16)</td>
<td>2451</td>
<td>2084</td>
<td>73</td>
<td>4535</td>
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<tr>
<td>Survey 7 (Dec 16 – Feb 9)</td>
<td>2445</td>
<td>916</td>
<td>70</td>
<td>3361</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>61,552</strong></td>
<td><strong>15,859</strong></td>
<td></td>
<td><strong>77,411</strong></td>
</tr>
</tbody>
</table>
Example results
Exploring the predictors of COVID-19 vaccination hesitancy in Canada
Sample description (N=16,673)*

Mean age:
- Less than 29 years: 19%
- 30-69 years: 71%
- 70 years or more: 10%

Education:
- High school/lower: 23%
- Graduate/Postgraduate: 77%

Living area:
- Urban: 57%
- Suburban: 33%
- Rural: 11%

Sex:
- Male: 25%
- Female: 75%

Perceived income:
- Top third: 34%
- Middle third: 51%
- Bottom third: 15%

*convenience sample data (March 2020-January 2021)
COVID-19 vaccine intentions among Canadians

- Extremely likely: 74.69%
- Somewhat likely: 16.14%
- Unlikely: 4.24%
- Very unlikely: 4.92%

[iCARE Study: n= 61,583, March 27-Nov 4th, 2020](https://mbmc-cmcm.ca/covid19/)
COVID-19 vaccine intentions in Canada: changes over time

% hesitant individuals (iCARE)

COVID new cases per million

March, April, May, June, July, August, September, October, November, December, January
## Profile of Hesitant Individuals

### Age:
- Less than 29 years: 32%
- 30-69 years: 25%
- 70 years or more: 16%

### Education:
- High school/lower: 28%
- Graduate/Postgraduate: 24%

### Living Area:
- Urban: 24%
- Suburban: 25%
- Rural: 28%

### Sex:
- Male: 22%
- Female: 26%

### Employment:
- Employed: 26%
- Student: 34%
- Unemployed: 22%

### Seasonal Flu Vaccination (in the last 5 years):
- 3-5 x: 11%
- 0/1/2 x: 36%

### Health Conditions at Risk:
- Yes: 21%
- No: 27%

### Perceived Income:
- Top third: 17%
- Middle third: 27%
- Bottom third: 35%
Association between COVID-19 related concerns and poor vaccine intentions

<table>
<thead>
<tr>
<th>Concern type</th>
<th>Estimate</th>
<th>SE</th>
<th>p-value</th>
<th>Lower CI</th>
<th>Upper CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-0.8826</td>
<td>0.1801</td>
<td>&lt;.0001</td>
<td>-1.2356</td>
<td>-0.5295</td>
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<tr>
<td>Health for others</td>
<td>0.3839</td>
<td>0.0546</td>
<td>&lt;.0001</td>
<td>0.2769</td>
<td>0.4909</td>
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<tr>
<td>Individual health</td>
<td>0.5694</td>
<td>0.0547</td>
<td>&lt;.0001</td>
<td>0.4622</td>
<td>0.6767</td>
</tr>
<tr>
<td>Individual economic concerns</td>
<td>-0.5112</td>
<td>0.0394</td>
<td>&lt;.0001</td>
<td>-0.5884</td>
<td>-0.434</td>
</tr>
<tr>
<td>Country level concerns</td>
<td>0.0243</td>
<td>0.0475</td>
<td>0.6091</td>
<td>-0.0688</td>
<td>0.1173</td>
</tr>
</tbody>
</table>

- Data coming from survey 2-7
- Logistic regression (adjusted for age, sex, area and period)
- PCA analysis conducted on 15 concern variables (To a great extent.....)
Young Canadians and COVID-19

*We define it as <40 years, you may self-identify as youth at any age*
Cancer patient left inoperable after Covid-19 delay

禁食

Excess mortality due to COVID-19

Coronavirus: case fatality rates by age

Case fatality rate (CFR) is calculated by dividing the total number of confirmed deaths due to COVID-19 by the number of confirmed cases.

Two of the main limitations to keep in mind when interpreting the CFR:
1. Many cases within the population are unconfirmed due to a lack of testing.
2. Some individuals who are infected will eventually die from the disease, but are still alive at time of recording.

Note: Case fatality rates are based on confirmed cases and deaths from COVID-19 as of: 17th February (China); 24th March (Spain); 24th March (South Korea); 17th March (Italy).

Data sources: Chinese Center for Disease Control and Prevention (CDC); Spanish Ministry of Health; Korea Centers for Disease Control and Prevention (KCDC).

Onder G, Rezza G, Brusaferro S. Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. JAMA.

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OurWorldInData.org – Research and data to make progress against the world’s largest problems.
Respondents’ profile

- Total N = 3,185
- Age 29.4 [19 – 40]
- Sex
  - Male – 41%
  - Female – 58%
- Health status
  - Cancer (n = 122)
  - Chronic health condition (n = 698)
  - Healthy (n = 2292)
<table>
<thead>
<tr>
<th>Because of COVID-19...</th>
<th>...I felt nervous, anxious, worried</th>
</tr>
</thead>
<tbody>
<tr>
<td>Because of COVID-19...</td>
<td>...I felt sad, depressed, hopeless</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Because of COVID-19...</td>
<td>...I felt lonely or isolated</td>
</tr>
</tbody>
</table>
Young Canadians and COVID-19 concerns

Young Canadian were equally concerned about catching COVID-19 & the healthcare system becoming overloaded.

Young people with cancer reported more disruptions in their medical care than young people with chronic health conditions.

Young people with cancer or chronic health condition reported more concern about health outcomes related to COVID-19 (OR = 2.29 and OR = 1.34).

*Analyses control for: age, gender, medical insurance, mental health, education, date*
So, what can we do?
Healthcare Professionals

Policy makers

Patients

Researchers
“It is as if we have invented sophisticated techniques to save people from drowning, but once they have been pulled from the water, we leave them on the doc [or riverbank] to cough and splutter on their own in the belief that we have done all that we can.”

F. Mullan, NEJM (1985)
Acknowledgments

Take the survey:  www.mbmc-cmcm.ca/covid19
Keep updated:  @mbmc_cmcm
Contact us:  covid19study@mbmc-cmcm.ca

Financial Support

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  - Fanie St-Jean, MSc
  - Wordcrafting©
iCARE Study - Overall Sample (Surveys 1 through 7)
March 27, 2020 to February 9, 2021
N = 77,411

**Americas:**
- Canada - 28,711
- USA - 22,853
- Colombia - 2,348
- Brazil - 2,325

**Europe:**
- UK - 2,799
- Ireland - 1,786
- France - 3,965
- Spain - 504
- Italy - 2,069
- Serbia - 607

**Middle East:**
- Turkey - 1,427
- Israel - 1,674

**Africa:**
- Kenya - 866

**Asia:**
- Malaysia - 1,730
- Indonesia - 521
- Taiwan - 2,598

**Oceania:**
- Australia - 2,752

**Sex:**
- Women: 71%
- Men: 29%

**Age:**
- 25 and under: 18%
- 26 to 50: 49%
- 51 and older: 33%

**Employment Status:**
- Unemployed: 21%
- Employed: 72%
- Student: 7%

**Income Level:**
- Bottom tertile: 14%
- Middle tertile: 57%
- Top tertile: 29%

**Education Level:**
- Elementary/Secondary: 20%
- Post-secondary: 80%

**Health Conditions:**
- Anxiety: 16%
- Depression: 9%
- Chronic disease: 33%
Other data sources

- The Johns Hopkins University: COVID-19 Dashboard
  - a semi-automated living data stream strategy
  - daily updates
  - COVID-19 cases, deaths, testing, and contact tracing

- Oxford University: Coronavirus Government Response Tracker
  - a systematic tracking of governments' policies and interventions in different countries
  - daily updates
  - COVID-19 governmental policies; COVID-19 Government Response Stringency Index (derived variable)

- Google: Google community mobility reports
  - using anonymized data provided by apps (Google Maps)
  - updates each 48-72 hours
  - movement trends over time by geography, across different categories of places (retail and recreation, groceries and pharmacies, parks, transit stations, workplaces, and residential)
iCARE data integration with external sources

- Epidemiologic surveillance
- Implemented governmental policies
- Population mobility and movements
- Population behaviours

Tagged by date and country
Select iCARE publications

- **Published/submitted/in press**

- **In progress**
iCARE data access

✔ iCARE team fosters continuous collaboration in order to maximize the scientific value of extensive data collected in our study

✔ No fees will be charged for accessing the iCARE research materials nor for statistical analysis/assistance requests

✔ The iCARE Study Analysis Plan (iSAP) Log - a repository of prospective analyses stemming from the work of the iCARE collaborators

✔ Research materials and data agreement (RMDA)

✔ Contact iCARE team: covid19study@mbmc-cmcm.ca
iCARE Study Analysis Plan Log

- https://mbmc-cmcm.ca/covid19/apl/log/

iCARE-VGB-0025 – Physical and mental health impact of the pandemic on healthcare and essential workers – Representative samples

iCARE-LK-0024 – Associations between COVID and mental health in students

iCARE-AGH-0023 – Impact of Covid-19 outbreak on Canadian with mental health disorder

iCARE-FD-0022 – Impacts of COVID-19 on Canadians with Chronic Diseases

iCARE-KLL-0021 – Vaccine intentions in Canadians – April to November – Representative samples

iCARE-KJD-0020 – Examining the Comparability Between the iCARE Canadian Representative and Convenience Samples

iCARE-AMB-0019 – Adherence to Preventative Measures for COVID-19 – Which Canadians are at Highest Risk of Spreading the Virus

iCARE-JS-0018 – Exploring predictors of COVID-19 Vaccination hesitancy across the globe

iCARE-VGB-0017 – Level of concern, vaccination willingness and health behaviour in the context of Covid-19 in France
Media coverage and infographics

How to make COVID-19 mask-wearing a habit: Social scientists offer some suggestions

Port du masque obligatoire: comment rappeler poliment de respecter les règles?

Covid-19: Mengapa ada perubahan sikap soal pemakaian masker di dunia?
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FINDINGS
With the exception of wearing a mask, most (78%) of respondents report adhering to major prevention measures at least most of the time.

More than 16% of people with confirmed or suspected COVID-19 worldwide report **NOT self-isolating** at least most of the time.

Wave 1; N=20,537
Adherence is worse among **younger age groups** compared to older (few are wearing a mask), p<.001

Adherence is better among **higher income groups** compared to lower (few are wearing a mask), p<.001
Association between concern (type) and adherence to COVID-19 preventive measures:

**economic concerns** (personal and about the general economy) & ‘getting back to normal’

↓

significant predictors of better adherence to prevention measures

Wave 1; N=20,537
Adherence is decreasing for basic hygiene measures, and increasing for face mask wearing.

Continuously, over 13% of people with confirmed or suspected COVID-19 worldwide report NOT self-isolating at least most of the time.
Snapshot of Italy

- Adherence to hand washing, social distancing and avoiding social gatherings → over 90%
- 22% of individuals reported NEVER self-quarantining behaviour (if having/believing to have COVID-19)

higher concerns for health of close individuals → higher adherence to hygiene measures
higher concerns about infecting other people in the community → higher practicing both physical and social distancing
Behavioural Trends over time Canada

Proportion of people in Canada engaging in preventive behaviours most of the time

- Hand washing with soap and water
- Wearing a face mask
- Staying at least 6 feet or 1-2 metres away from others
- Self-quarantining if you have or believe you have the virus
- Avoiding all social gatherings

wave 1, wave 2, wave 3