



CANADIAN PUBLIC SUPPORT
FOR THE USE OF MOBILE PHONE DATA
TO FIGHT THE COVID-19 PANDEMIC

May 7, 2020

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	4. ,I DVVXUHG WKDW WKHLU GDWD ZDV NHSW FRQÀGHQWLDO ODUJ... information from contact tracing apps with their physician (96 percent), their family SHUFHQW SXEOLF KHDOWK RIÀFLDOV SHUFHQW DQG KHD...)HZHU ZRXOG VKDUH ZLWK HPSOR\HUV DQG FRZRUNHUV SHUF... (73 percent), law enforcement (68 percent), and social media platforms (35 percent).	
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About the Senators



Senator Rosemary Moodie
Senator for Ontario

Distinguished medical leader, Neonatologist and Paediatrician, who understands the balance between protecting patient privacy, and having timely and accurate patient information to manage an outbreak, based on her front-line experience with SARS.



Senator Donna Dasko
Senator for Ontario

Former national pollster, media commentator, and private sector business leader with considerable public policy experience.



Senator Colin Deacon
Senator for Nova Scotia

Former tech entrepreneur. Focused on advancing entrepreneurship in Canada and ensuring that Canadian privacy legislation protects individuals while empowering a globally competitive economy.

Research Lead



Peter Loewen, PhD
Professor, University of Toronto Senior Fellow, Massey College Fellow, Public Policy Forum

Privacy Advisor



David TS Fraser
Partner with McInnes Cooper practicing privacy, internet and technology law. Part-time faculty at Schulich School of Law at Dalhousie University.

I. Methodology

We partnered with Abacus Data to procure an online sample of ~1,500 members of the general population. The sample was drawn from the Fulcrum platform. Sampling occurred from May 2 to 4, 2020. The survey instrument was presented on the Qualtrics online platform. The sample was weighted to reflect regional breakdowns corresponding to the relative size of each province. Given the small base population in the territories, no respondents were sought in the territories.

Sample was drawn from the Fulcrum platform. Sampling occurred from May 2 to 4, 2020. The survey instrument was presented on the Qualtrics online platform.

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Weighting of data occurred in two fashions. First, marginal values were adjusted using an iterative procedure as provided by the ipfweight command in STATA15, according to census targets on age group and gender within provinces. Once these weights were inspected for reasonable parameters (ie. no weights greater than 5 or less than 0.2), we then relied on Qualtrics' similar interlocking weighting function to weight the results presented in this report. A log of complete crosstabs with STATA weighting (ie "banners") are available in the appendix.

Our survey instrument design was led by Peter Loewen in consultation with Senators Colin Deacon, Donna Dasko, and Rosemary Moodie.



II. Executive Summary

Canada is engaged in a major struggle to control the spread of COVID-19. This pandemic is having devastating effects on the health of Canadians and our economy. Key to combatting this pandemic is a combination of social distancing, widespread testing, and effective contact tracing.

, Q WKL V UHSRUW ZH H[SORUH & DQDGLDQV. YLHZV RQ FRQV capabilities of their mobile phones. We demonstrate that Canadians are on the whole supportive of the use of contact tracing technology and would support its widespread adoption if their privacy is protected with appropriate safeguards.

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1. In the absence of a vaccine or treatment for COVID-19, 90 percent of Canadians believe that it will be necessary to continue contact tracing.
2. 87 percent of Canadians believe that they would share their location data with health researchers if they have been close to someone who has tested positive for COVID-19.
3. 87 percent of Canadians believe contact tracing apps should trigger testing of themselves and others.
4. 87 percent of Canadians would share their location data with health researchers (87 percent). Fewer would share with employers and coworkers (75 percent), other government agencies (71 percent), and family and friends (65 percent).
5. 65 percent of Canadians support the mandatory use of contact tracing apps.
6. The privacy concerns of Canadians tend to align with the privacy safeguards proposed by Canada's Federal Privacy Commissioner.

Canadians are ready for a widespread adoption of contact tracing applications, provided that the applications are designed to protect privacy and are used in a way that respects individual rights.

III. Background

How can we get Canadians out of their homes, back to work, and back into schools while protecting their health and safety in the midst of this pandemic? Canadians have indicated that they are supportive of the use of contact tracing apps, as are being used in several jurisdictions around the world, as a key

In an effort to limit the spread of COVID-19, governments have mandated a combination of social distancing, expanded testing, widespread closures of non-essential services, and border closures. Parallel to this is a truly international effort to develop, test, and deploy a vaccine, a process that many experts expect could take up to 18 months or more. While we wait for a vaccine, it is becoming increasingly clear that a technological solution may help to control the spread of the disease and allow for existing restrictions to be increasingly and safely lifted.

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This analog process, with individuals recalling from memory those with whom they have had contact at places they have been, is not without its shortcomings. However, without such contact tracing, the public health consensus is that we cannot contain the spread of the COVID-19.

This is why technological solutions, which rely on the location and proximity tracking capabilities of mobile phones, are being used in many jurisdictions. For example, a technology might work by logging when two cellphones (and presumably the individuals carrying them) are proximate to one another, as captured by Bluetooth. If one of those individuals later tests positive for the coronavirus, the person with whom they were in contact will increase the speed, accuracy and completeness of contact tracing.

In this report, we demonstrate that Canadians are on the whole supportive of the use of contact tracing apps to control the spread of COVID-19 while protecting their privacy. A complete annex with all results follows our report.

\$ORQJVLGH WKLW VWURQJ VXSSRUW IRU WKH XVH RI FRQWDFW TRACING APPS TO HELP CONTROL THE SPREAD OF COVID-19 WHILE PROTECTING THEIR PRIVACY. A COMPLETE ANNEX WITH ALL RESULTS FOLLOWS OUR REPORT.

* 7 Detailed Survey Findings

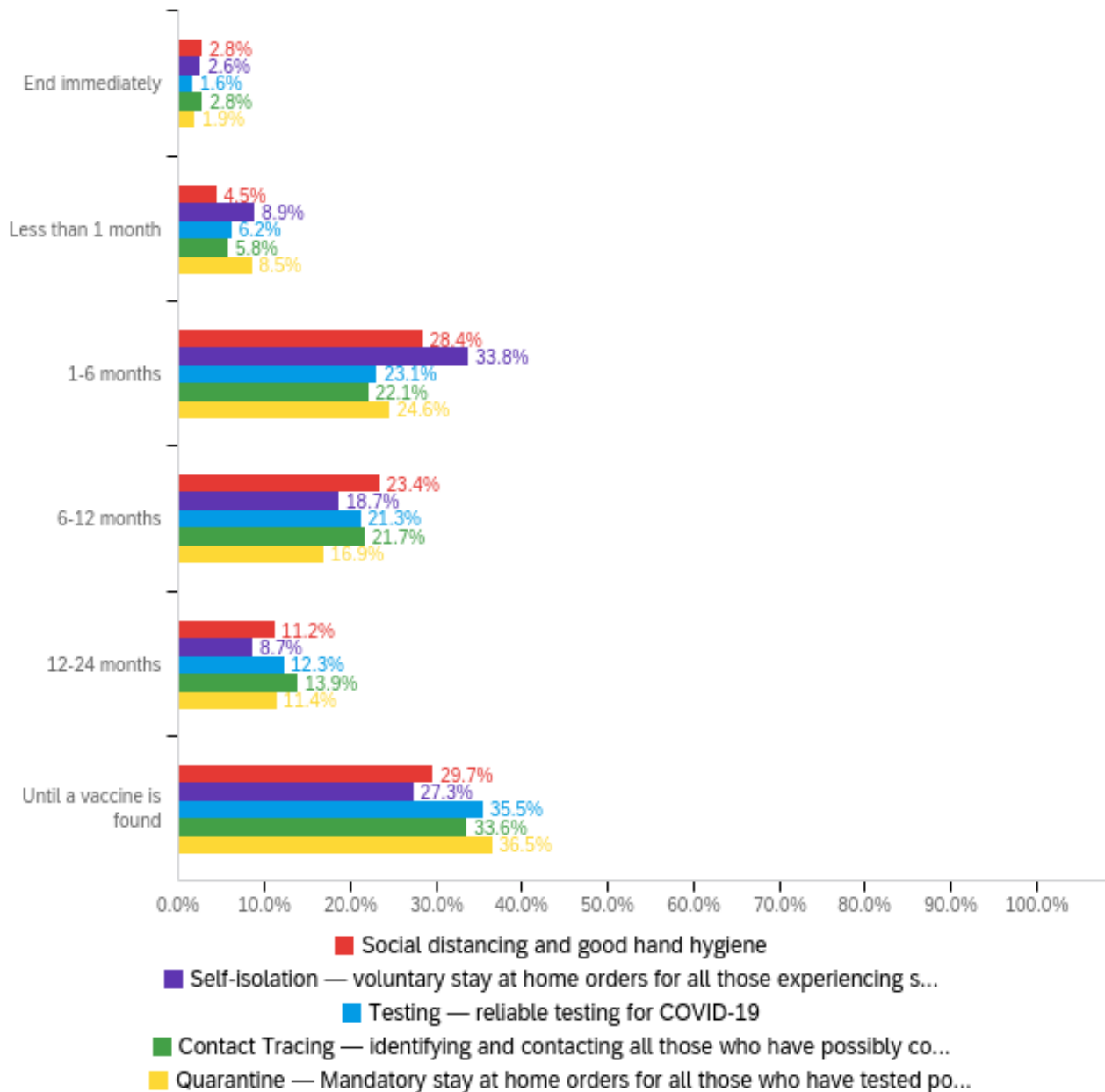
Finding 1:

In the absence of a vaccine or treatment for COVID-19, 90 percent of Canadians believe that it will be necessary to continue contact tracing.

When we ask Canadians how long contact tracing will need to be in place in order to control COVID-19, 36 percent believe it will need to be in place for at least 6 months, while another 34 percent believe it will be necessary until a vaccine is found.

When asked about what will be necessary in the absence of a vaccine or an effective treatment for COVID-19, 90 percent of Canadians believe that it will be necessary to continue contact tracing. Of those who think other measures will be necessary, including social distancing and good hand hygiene (94 percent), self-isolation for those experiencing symptoms (91 percent), reliable testing for COVID-19 (89 percent), and wearing masks (88 percent).

For how long do you think it will be necessary to keep each measure in place to control COVID-19?



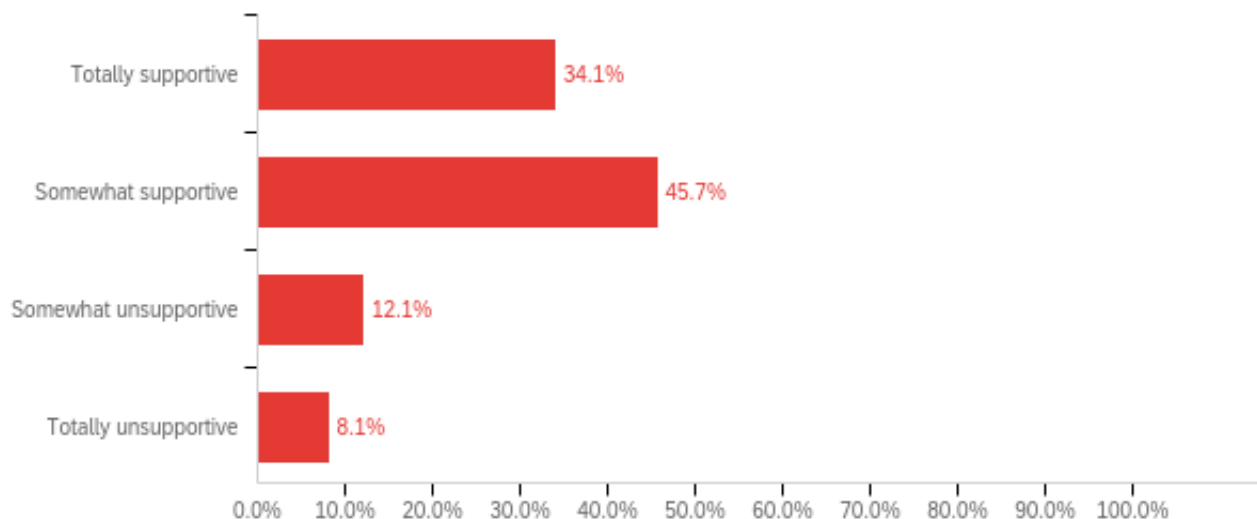
Finding 1 upshot: Canadians understand that contact tracing is necessary as a public health response to COVID-19.

Finding 2:

80 percent of Canadians support the use of mobile device data by public health officials to notify those who have been close to someone who has tested positive for COVID-19.

80 percent of respondents told us they were either totally supportive or somewhat supportive. Just 8 percent took the strongest oppositional position of “totally unsupportive”.

If the tracking capabilities of smart phones provided public health officials with the ability to anonymously and automatically notify all those who have been close to someone who tested positive for COVID-19, how supportive would you be of using this capability in Canada?

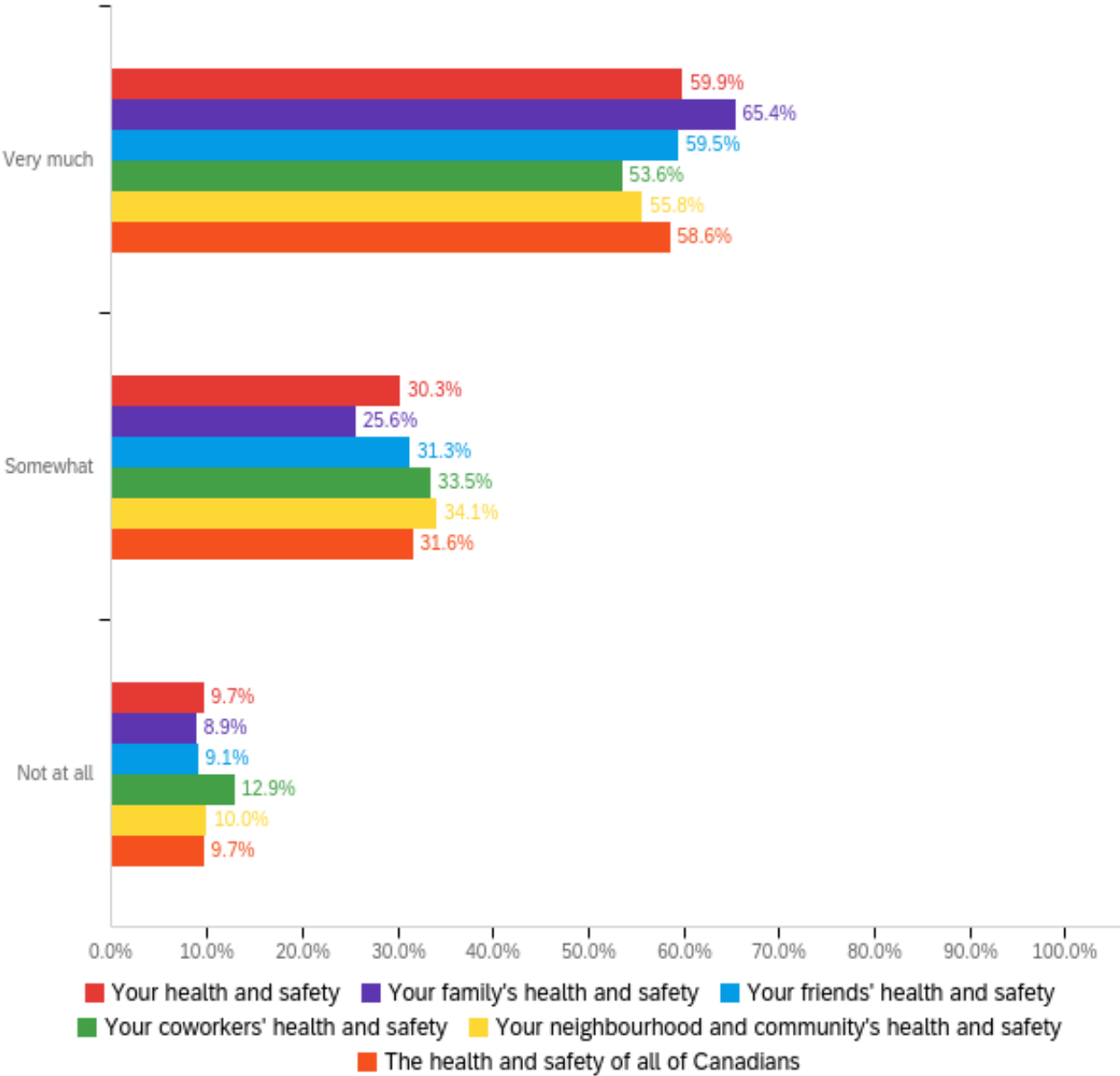


Importantly, this support is shared across major demographic groups. The percentage of respondents who are totally or somewhat supportive was 80 percent in Atlantic Canada, 77 percent in Quebec, 82 percent in Ontario, and 81 percent in the West (79 percent and 81 percent respectively). Finally, Canadians of all age groups are supportive, with 76 percent of those aged under 35, 78 percent of those aged 35-54, and 84 percent of those aged 55 or older being totally or somewhat supportive.

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For example, 60 percent said it would matter very much that such an app could protect their health and safety, while 65 percent and 59 percent respectively said it would matter very much that such an app could protect their family's health and safety and the health and safety of all Canadians.

If this technology helped to decrease the spread of COVID-19, how much would the following considerations motivate you to use it?



Finding 2 upshot: Canadians are willing to use contact tracing apps, and they see them as a part of our collective effort against the coronavirus.

Finding 3:

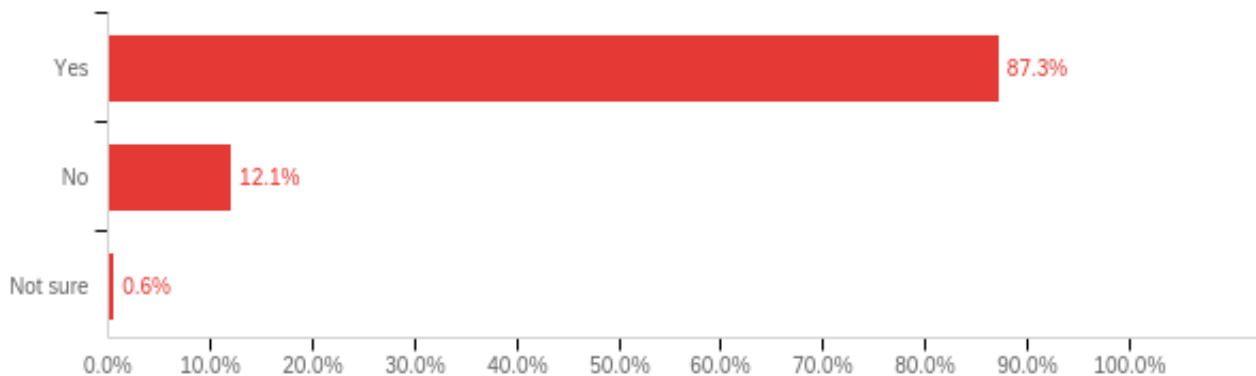
87 percent of Canadians believe contact tracing apps should trigger testing of themselves and others.

THEIR VIEWS ARE IMPORTANT FOR THOSE WHO ARE DESIGNING AND REGULATING SUCH APPS. NEARLY NINE-IN-TEN CANADIANS (87 PERCENT) THINK THAT THOSE WHO TEST POSITIVE FOR COVID-19 SHOULD BE AUTOMATICALLY NOTIFIED AND OFFERED TESTING. WHEN WE EARLIER ASKED CANADIANS IF THEY WOULD BE WILLING TO SHARE A POSITIVE TEST RESULT ANONYMOUSLY, 92 PERCENT AGREED. THIS SUGGESTS BROAD WILLINGNESS OF CANADIANS TO ANONYMOUSLY SHARE THEIR LOCATION HISTORY FROM THE PREVIOUS TWO WEEKS IN ORDER TO ASSIST IN IDENTIFYING OTHERS WHO MAY HAVE BEEN INFECTED.

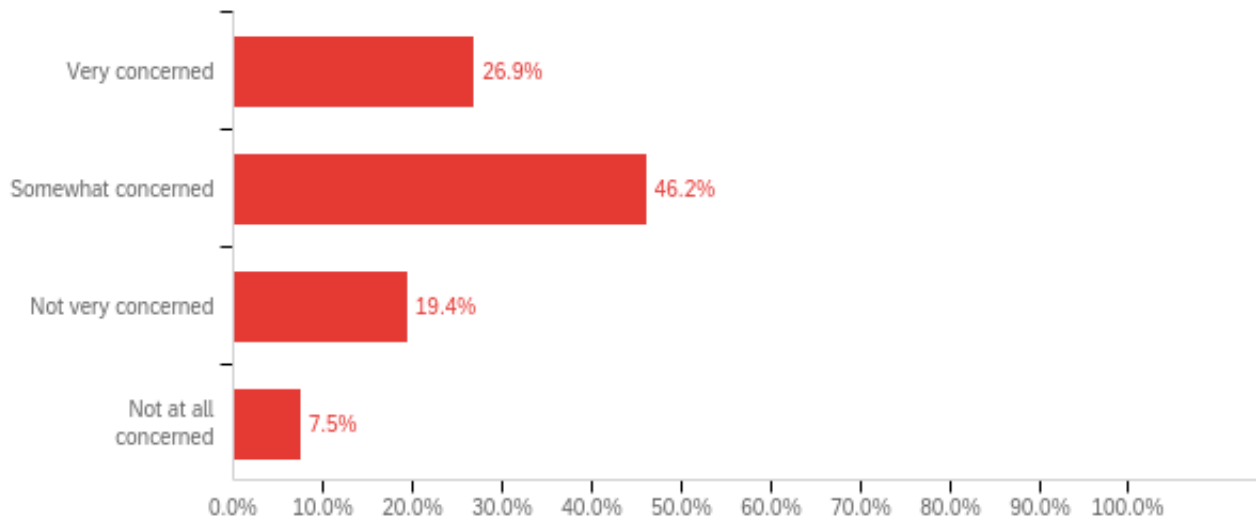
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If you were then tested, would you be willing to anonymously share your results so that others could also be automatically notified if they need to be tested.



How concerned are you that sharing this information would allow you to be identified and/or discriminated against?



Finding 3 upshot: Canadians are willing to anonymously share positive test results WKURXJK D FRQWDFW WUDFLQJ DSS KRZHYHU WKHUH LV VLJQLÀF can result in discrimination and therefore will need to be assured of anonymity.

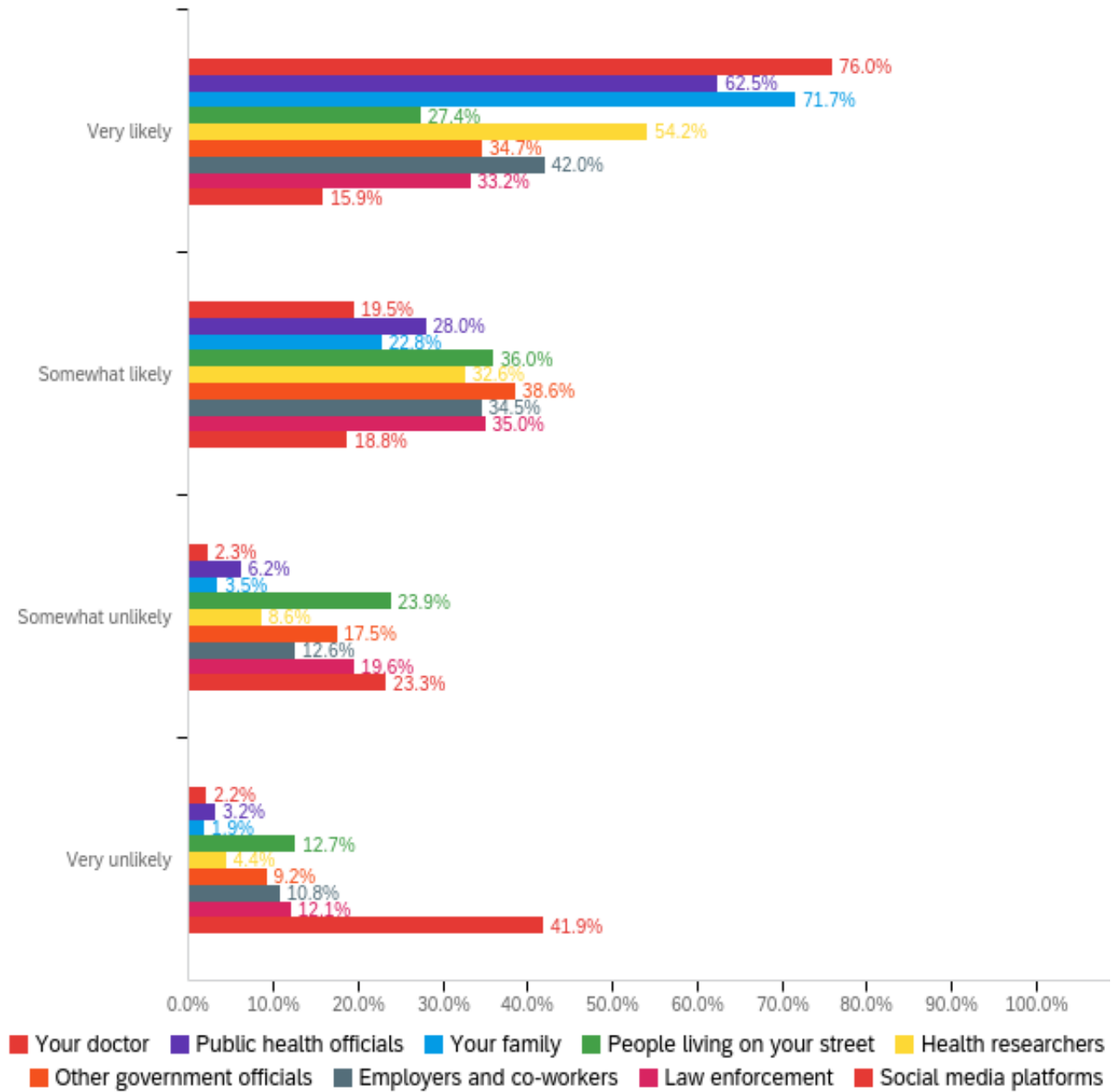
Finding 4:

If assured that their data was kept confidential, large numbers of Canadians would share information from contact tracing apps with their physician (96 percent), their family (95 percent), public health officials (91 percent) and health researchers (87 percent). Fewer would share with employers and coworkers (75 percent), other government officials (73 percent), law enforcement (68 percent), and social media platforms (35 percent).

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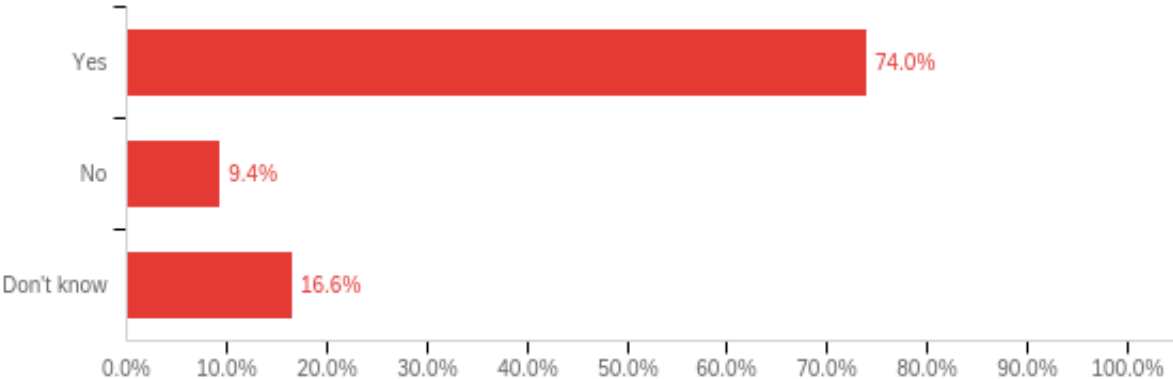
and the police. The only group which a majority of Canadians are somewhat or very unlikely to share their data with are social media platforms.

How likely would be to share this same information with each of the following people or groups, if you knew this information would be kept confidential?

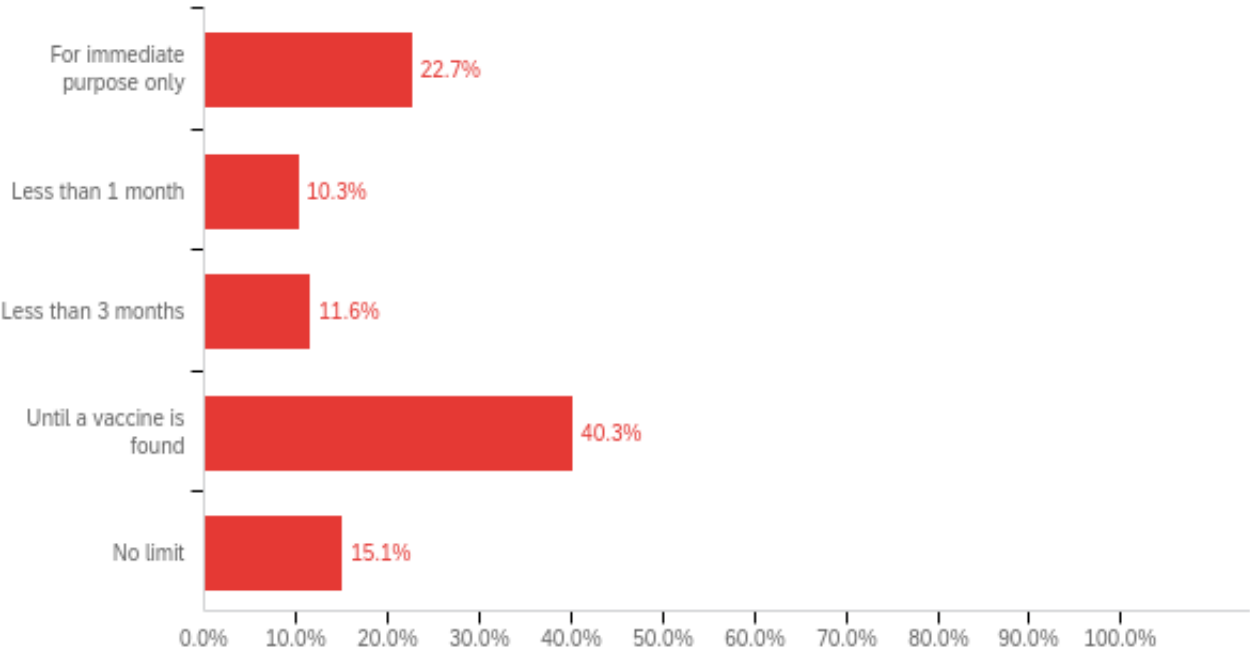


3 URYLGHG WKDW GDWD DUH GHLGHQWLÀHG SHUFHQW RI for use by health researchers. 40 percent believe those data should be kept until a vaccine is found, 15 percent believe there should be no limit on how long such data are retained by health researchers.

If you could be certain that anything that could identify you was fully removed from information, would you be willing to allow it to be saved for use by doctors, health researchers, and other medical scientists who are preparing for the next pandemic?



How long should it be possible for this information to be kept for?



Finding 4 upshot: With proper protections, Canadians are willing to have their data shared

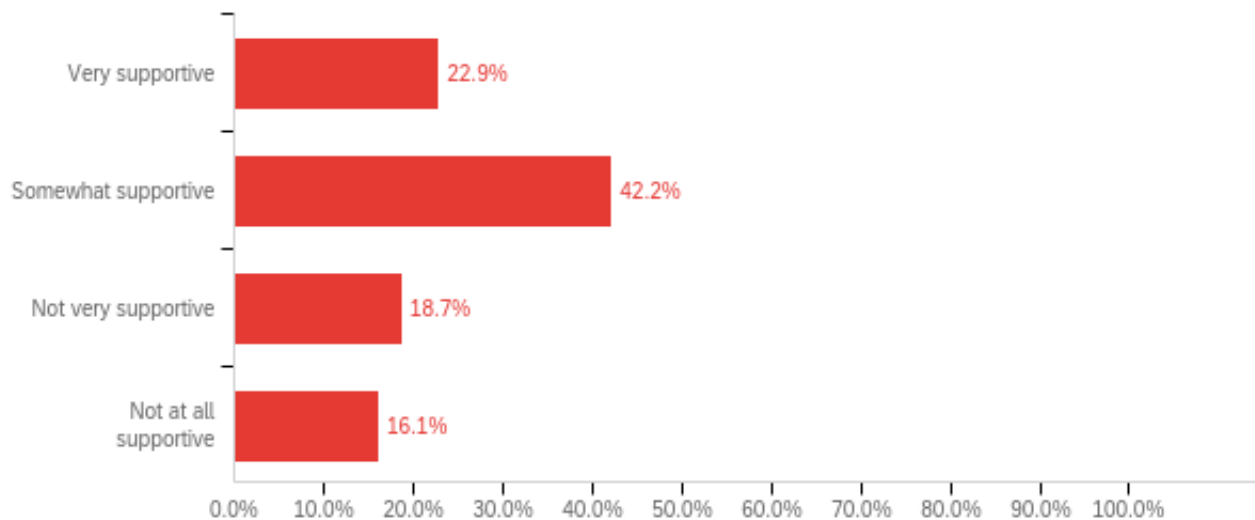
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Finding 5:

65 percent of Canadians support the mandatory use of contact tracing apps.

We asked Canadians if they could be supportive of mandating the use of contact tracing apps. 65 percent of Canadians agree with a mandatory downloading of a contact tracing application.

In some countries, installation of this application is mandatory. How supportive would you be for this to be the case in Canada?



This support for the mandatory use of a contact tracing app is shared across demographic groups. Regionally, the percentage of respondents who are very or somewhat supportive is 65 percent in Atlantic Canada, 65 percent in Quebec, 64 percent in Ontario, 65 percent in the Prairies, and 68 percent in British Columbia. The same percentage of men and women (65 percent) report being very or somewhat supportive.

Finding 5 upshot: There is broad support for mandated contact tracing apps.

Finding 6:

The privacy concerns of Canadians tend to align with the privacy safeguards proposed by Canada’s Federal Privacy Commissioner.

Canada’s Federal Privacy Commissioner Daniel Therrien did not announce his findings while the survey was in market. He stated “the federal government must obtain “meaningful consent” from Canadians if it wants them to use any future smartphone app to digitally track coronavirus cases” and that the “design must be done properly, and meet a series of criteria, in order to balance privacy concerns with public health needs.”

- most importantly that the app only collects location and health data for public health purposes, not for commercial or “state surveillance” purposes
- users should know what they’re signing up for, with the government clearly laying out how their data will be used in order to achieve meaningful consent
- data collected through the app should only be kept for a limited time period — in this case when the threat of the pandemic is over — and destroyed once that time period ends

Mr. Therrien also added that “if Canada chose to make its app mandatory — or felt it had no other choice but to do so — his safeguards would become even more important to gain the public’s trust.”

Our respondents are in broad agreement with these criteria. First, respondents are willing to share the data with law enforcement or commercial social media platforms (see Finding 4). Second, the data individuals say they are willing to share is anonymized data (see Finding 4). Third, individuals are mostly willing to allow their data to be stored for immediate use in addressing the pandemic (see Finding 4).

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Conclusions

Canadians are deeply concerned about the risks associated with COVID-19, both human and economic. While there are many available technologies to help trace and test for the virus, policy makers should consider enabling the use of these sort of apps if the privacy of individual users is protected.



APPENDIX A:
LIST OF SURVEY
QUESTIONS

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):=60/ 1=:8 3:80

9.=0,>0/ 3,9/ B,>3492

A:4/0/ -,=> =0>?,@=,9?> ,9/ :?30= ;7,..0> B4?3 .=:B/>

A:4/0/ 2=:.0=D >?:=0> ,? ;0,6 ?480>

A:4/0/ 49 ;0=>:9 ..9?,.? B4?3 1=409/> 1,847D ,9/ ,.<@,49?,9.0

%?:.60/ @; :9 2=:.0=40> ,9/ ;=:A4>4:9> 7460 3,9/ >,94?4E0=

,49?,490/ 80?0=> :1 /4>?,9.0 1=:8 ;0;;70 ,> 8@.3 ,> ;:>>4-70

:A0/ 49 ;0=>:9 ,;;:49?809?> ? : A4=?@,7 800?492>

9.=0,>0/ 8D =074,9.0 :9 :97490 >3;;;492 1:= ;@=.3,>0>

A:4/0/ /:80>?4. ?=,A07

A:4/0/ ?30 @>0 :1 ;@-74. ?=,9>4?

%?,D0/ ,? 3:80 ,> 8@.3 ,> ;:>>4-70

):=0 , 8,>6

:90 :1 ?30 , -:A0 3,A0 9:? 8,/0 ,9D 7410>?D70 .3,920>

: D:@ 3,A0 , 5:- ?3,? 4> ,? =4>6 -0.,@>0 :1 !(
 *0>

,D-0

:

3,A0 ,7=0,/D -009 7,4/ :11 /@0 ?: ?30 A4=@>

: D:@ 69:B >:80:90 ;0=>:9,77D B3: 3,> 7:>? ?304= 5:- ,> , =

*0>

:

:9 ? 69:B

,A0 D:@ -009 ?0>?0/ 1:= !(
 *0>

:

:

,A0 -009 ?=D492 ?: 20? ?0>?0/ -@? @9,-70

,> >:80:90 49 D:@ = 3:@>03:7/ -009 ?0>?0/ 1:= !(
 *0>

:

:

,A0 -009 ?=D492 ?: 20? ?0>?0/ -@? @9,-70

:= 3:B 7:92 /: D:@ ?3496 4? B477 -0 90.0>> ,=D ?:
!(

9/ 0>> ?3,9 '9?47
4880/4,?078 D:9?3 8:9?3> 8:9?3> 8:9?3> A,...490 4>
1:@9,

%:.4,7 /4>?,9.492 ,9/ 2::/ 3,9/ 3D240	0	0	0	0	0	0
%071 4>:7,?4:9 F A:7 @9?,=D >?,D ,? 3:80 :=/0=> 1:= ,77	0	0	0	0	0	0
?3:>0 0C;0=409.492 >D8;?:8 &0>?49 =074,-70 ?0>?492 1:=	0	0	0	0	0	0
!(:9?,,? &=,.492 F 4/09?41D492 ,9/ .:9?,,?492 ,77 ?3:>0 B3: 3,A0	0	0	0	0	0	0
;>>4-7D .:9?,,?0/ >:80:90 B3: ?0>?> ;>4?4. #@,=,9 F ,9/,?:=D >?,D ,? 3:80 :=/0=> 1:= ,77	0	0	0	0	0	0
?3:>0 B3: 3,A0 ?0>?0/ ;>4?4.						

:B 7:92 /: D:@ ?3496 4? B477 -0 @9?47 B0 3,A0 , ! (

0>> ?3,9 8:9?3>

8:9?3>

8:9?3>

:920= ?3,9 8:9?3>

)309 , A,...490 4> /4>.:A0=0/ B477 D:@ ?,60 4?

*0>

:

:? >@=0

):@7/ D:@ =0.:8809/ ?3,? :?30=> /: ?30 >,80

*0>

,D-0

:

9 ? 30 , -> 09.0 : 1 , A , .. 490 := 0 1 1 0 . ? 4 A B , ? = 0 : , D 8 @ ? ? 3 4 1 9 6 4 ! ? B
- 0 9 0 . 0 > > , = D ? : . : 9 ? 4 9 @ 0 / : 4 9 2

* 0 > ? 3 4 > B 4 7 7 - : ? 3 4 > B 4 7 7 9 : ?

% : . 4 , 7 / 4 > ? , 9 . 4 9
3 , 9 / 3 D 2 4 0 9 0

○

○

% 0 7 4 : 7 , ? 4 : 9 F A
> ? , D , ? 3 : 8 0 := / 0 => 1 : = , 7 7
? 3 : > 0 0 C ; 0 = 4 0 9 . 4 9 2
> D 8 ; ? : 8 >

○

○

& 0 > ? 4 9 2 F = 0 7 4 , -
!(

○

○

: 9 ? , . ? & = , . 4 9 2
4 / 0 9 ? 4 1 D 4 9 2 , 9 / . : 9 ? , . ? 4 9 2 , 7 7
? 3 : > 0 B 3 : 3 , A 0 ; : > > 4 - 7 D
.: 9 ? , . ? 0 / > : 8 0 : 9 0 B 3 : ? 0 > ? >
; : > 4 ? 4 A 0

○

○

@ , = , 9 ? 4 9 0 F ,
> ? , D , ? 3 : 8 0 := / 0 => 1 : = , 7 7
? 3 : > 0 B 3 : 3 , A 0 ? 0 > ? 0 /
; : > 4 ? 4 A 0

○

○

,9D ;@-74. 30,7?3 0C;0=?> ,9/ >.409?4>?> ?34964?3,?? ,9 0110.?4A
70,>? 8:9?3> ,B,D

&: 7484? ?30 >;=0,/ :1 !(,9/ ? : ,A:4/ -@>490>>0> ,9/ >.3::7> -0492
8,9D 0C;0=?> ?3496 ?3,?>B9>9000 ?::,4,,7?/4.0?,9.492 9 ,//4?4:9 >:80
5@=>4>/4.?4:9> ,=0 @>492 ?0.39:7:2D ? : ?=,.6 ?30 >;=0,/ :1

!(?=,.0 4?> .:990.?4:9> -0?B009 ;0;;70 ,9/ 4>:7,?0 ?3:>0 B3: ,=0
-0.:80 -0??0=

&: .30.6 ?3,? D:@ 3,A0 ;=::0=7D @9/0=>?::/ ?34> 491:=8,?4:9 .:@7/ D
B34.3 :1 ?30 1:77:B492 >?,?0809?> 4> 8:>? .:=0.?

)4?349 ?30 90C? >4C 8:9?3> , A,..490 B47,9/>B0;.?30 >;=0,/ :1 !(
=0?@=9 ? : 9:=8,7 7410

&: -0249 ;;09492 @; -@>490>>0> ,9/ >.3::7> .4?4E09> 900/ ? : .:9?
>:.4,7 /4>?,9.492

&: -0249 ;;09492 @; -@>490>>0> ,9/ >.3::7> .4?4E09> 900/ ? : .:9?
>:.4,7 /4>?,9.492 ,9/ 8,D 900/ ? : ,/;;? ?=,.6 ?=,.0 ,9/ 4>:7,?0 ?0.39

&: -0249 ;;09492 @; -@>490>>0> ,9/ >.3::7> B0 900/ ? : ,/;;? ?=,.6
?0.39:7:2D

:9?,.? ?=,.492 4> ?30 ;=:.0>> :1 ?=,.6492 /:B9 ,9/ ?0>?492 ,77 ;0=
.:9?,.? B4?3 ,9 4910.?0/ ;0=>:9 @==09?7D4.237> 4B3/:00?-D=A@0B4. 30
,9 4910.?0/ ;0=>:9 ,9/ ?309 ;3:90 0,.3 ;0=>:9 B3: 30 >30 =0.,77> ?3,? ?
B4?3 :A0= ?30 ;=0A4:@> /,D>

)0=0 D:@ 1,8474,= B4?3 3:B .:9?,.? ?=,.492 B:=6> -01:=0 .:8;70?492 ?3

*0>

:

&:/,D > >8,=? ;3:90> 3,A0 7:.,?4:9 ,9/ ;=:C484?D ?=,.6
 =,;4/ ?0>?492 .,;,-474?40> ?34> ?0.39:7:2D .:@7/ 307; ;@-74. 3
 ,...@=,?07D ,9/ .:8;70?07D ?=,.0 ?30 ;:>34-7 B>@=70,/7:7:B! ?308
 ?: ;:=?0.? ;@-74. 30,7?3 ,9/ 307; ?:-0??0= 8,9,20 ?30 0,>492 :1

1 ?30 ?=,.6492 .,;,-474?40> :1 >8,=? ;3:90> ;=:A4/0/ ;@-74.
 ?: ,9:9D8:@>7D ,9/ ,@?:8,?4.,77D 9:?41D ,77 ?3:>0 B3: 3,A0 -00
 ;:>4?4A0 1:= !(3:B >@; ;:=?4A0 B:@7/ D:@ -0 :1 @>492 ?34

- &:?,77D >@; ;:=?4A0
- %:80B3,? >@; ;:=?4A0
- %:80B3,? @9>@; ;:=?4A0
- &:?,77D @9>@; ;:=?4A0

1 ?34> ?0.39:7:2D 307;0/ ?:/0.=0,>30: B 300@>3=B ;@:71/ ?!0
 1:77:B492 .:9>4/0=,?4:9> 8:?4A,?0 D:@ ?:@>0 4?

	(0=D 8@.3	%:80B3,?	:? ,? ,77
*:@ = 30,7?3 ,9/ >,10?D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*:@ = 1,847D ,9/ >,10?D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*:@ = 1=409/ ,9/ >,10?D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*:@ = .:B:=6 30,7?3 ,9/ >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*:@ = 90423-: ,9/ .:88@94?D > 30,7?3 ,9/ >	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
&30 30,7?3 ,9/ >,10?D :1 ,77 :1 ,9/,4,9>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

):@7/ D:@ B,9? ? : -0 ,@?48, D4@7BD=0:0C14>0/ ? : >:80 07>0 B3: ?0
;:>4?4A0 >: ?3,? D:@ .:@7/ -0 =,;4/7D ?0>?0/

- *0>
- :
- :9 ? 69:B

1 D:@ B0=0 ?309 ?0>?0/ B:@7/ D:@ -0 B477492 ? : ,9:9D8:@>7D
: ?30=> .:@7/ ,7>: -0 ,@?:8,?4.,77D 9:?4140/ 41 ?30D 900/ ? : -0 ?0>?

- *0>
- :
- :9 ? 69:B

:B 74607D B:@7/ -0 ? : >3,=0 ?34> >,80 491:=8,?4:9 B4?3 0,..3 :1
2=:@;> 41 D:@ 690B ?34> 491:=8,?4:9 B:@7/ -0 60;? .:914/09?4,7

(0=D 74607D B0B3,? 74607D @97460 (0=D @974607D

*:@ = /:?.?:=	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
"@-74.3 :114.4,7>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
*:@ = 1,847D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
"0:;70 74A D:@ = >?=00?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
0,7?3 =0>0,=.30=>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
! ?30= 2:A0=9809? :114.4,7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8;7:D0=> .: B:=60=>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
,B 091:=-.0809?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
%:.4,7 80 ;7,?1:=8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

:B .:9.0=90/ ,=0 D:@ ?3,? >3,=492 ?34> 491:=8,?4:9
,9/ := /4>.=4849,?0/ ,2,49>?

- (0=D .:9.0=90/
- %:80B3,? .:9.0=90/
- :? A0=D .:9.0=90/
- :? ,? ,77 .:9.0=90/

1 D:@ .:@7/ -0 .0=? ,49 ?3,? D9D?@4B2>?B@77:D@708:/A0/?4≠:8
491:=8,?4:9 B:@7/ D:@ -0 B477492 ? : ,77:B 4? ? : -0 >,A0/ 1:=
,9/ :?30= 80/4.,7 >.409?4>?> B3: ,=0 ;=0; ,=492 1:= ?30 90C? ; ,9

- *0>
- :
- :9 ? 69:B

:B 7:92 >3:@7/ 4? -0 ;:>>4-70 1:= ?34> 491:=8,?4:9 ? : -0 60

- := 4880/4,?0 ;@=;:>0 :97D
- 0>> ?3,9 8:9?3
- 0>> ?3,9 8:9?3>
- '9?47 , A,..490 4> 1:@9/
- : 7484?

:B B477492 B:@7/ D:@ -0 ? : 49>?,77 ,9 ,;;74.:@?4:9:.,94D9@ = ;3:90 ?
:A0= ?30 ;=0A4:@> /,D> 1:= @>0 -D ;@-74. 30,7?3 :114.4,7>

- (0=D B477492
- %:80B3,? B477492
- :? A0=D B477492
- :? ,? ,77 B477492

9 >:80 .:@9?=40> 49>?,77,?4:9 :1 ?34> ,;;74.,?4:9 4> 8,9/,?:=D
-0 1:= ?34> ? : -0 ?30 .,>0 49 ,9,/,

- (0=D >@;::=?4A0
- %:80B3,? >@;::=?4A0
- :? A0=D >@;::=?4A0
- :? ,? ,77 >@;::=?4A0

1 D:@ ?0>?0/ ;:>4?4A0 1:= !(/: D:@ ?3496 D:@ >3:@7/ -0 =0
>3,=0 D:@ = 7:.,?4:9 34>?:=D 1=:8 ?30 ;=0A4:@> ?B: B006> 49 :=/0= ?:
B3: ,=0 ,? =4>6 :1 4910.?4:9 -0., @>0 ?3@D/B=0,94/7-DD?@?9/ ?3,? ?30

- *0>
- :
- :9 ? 69:B

\$0.09?7D @>?=?,74, 3,> 49?=@/ @.0/ , .:9?,.? ?=,.492 ,;;74.,?4:9
/:B97:,/0/ 8:=0 ?3,9 84774:9 ?480> 49 ?30 14=>? B006 '9/0= @>?
A4:7,?0> :?30=> ;=4A,?0 /,?, :9 ?30 ,;; 4> >@-50.? ? : >0A0=0 149,9
8:=0 B477492 ? : @>0 , .:9?,.? ?=,.492 ,;;74.,?4:9 1:= >8,=? ;3:90> 4
;7,.0

- *0>
- :
- '9> @ = 0

```

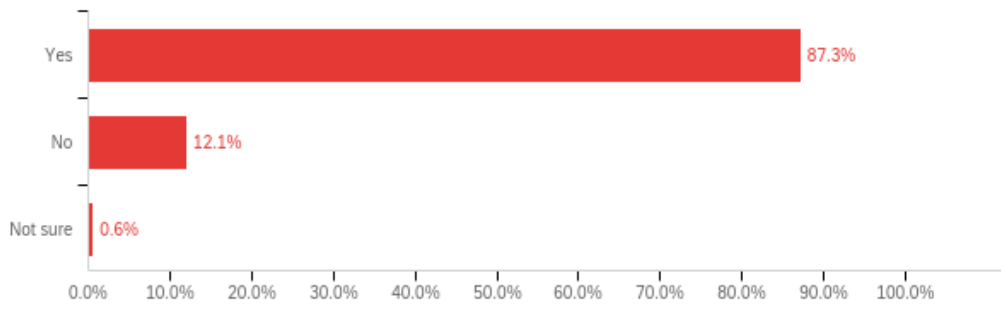
#      :B 8@.3 /: D:@ ,2=00 := /4>,2=00 B4?3 0,.3 :1 ?30 1:77:B492 >?
      %?=:92      2=00      04?30=      4>,2=00 %?=:92
      ,2=00      9:= /4>,      /4>,2=(
)0 >3:@
@>0 ,77 ?30
?0.39:7:2D
,A,47,-70 ?:
@> ? : >?:: ?30
!(
;,9/084
/:9 ? ?
2:A0=9809?
?: ;=?0.? 8D
;0=>:9,7
491:=8,?4:9
09:@23 ? : @>0
, ?=,.49.
B:@7/
? =,.492 ,;; 41
,9/ :97D 41
;@-74. 30,7?3
:114.4,7> 3,A0
,..0>> ? : ?30
/,?,
1 @>4$
,;; B:@7/
09/ >.3 :7
,9/ -@>490>>
.7:>@=0>
>::90=
B:@7/ -0
B477492 ? : /:
>:

```

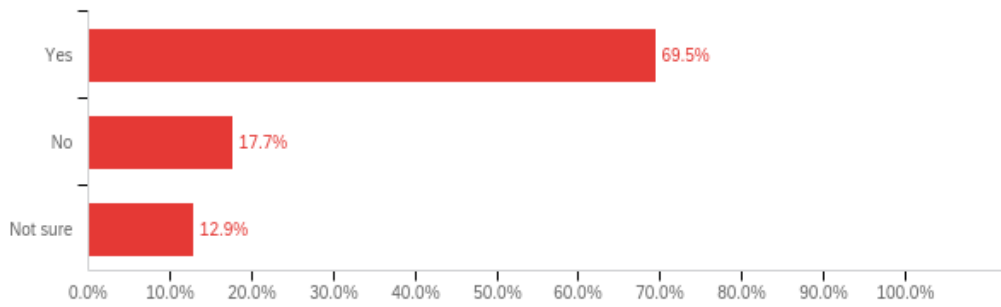


APPENDIX B:
TOPLINE RESULTS
AND GRAPHS

1 ;17 75' # 5/#46 2*10'



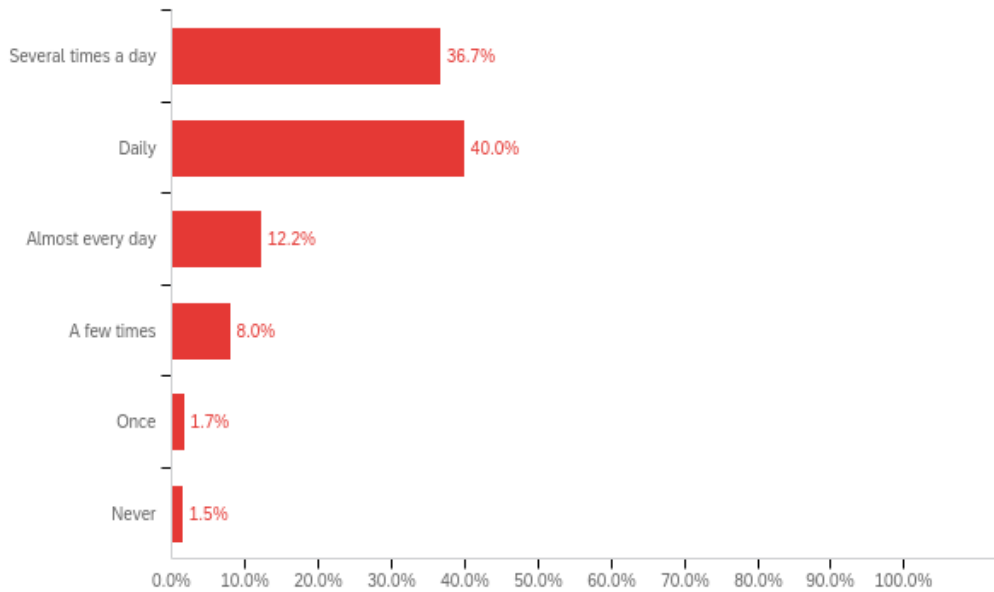
4' ;17 (#/.+ #4 9+6* 6*' .1%#6+10 64#%+0) #\$.+.+6+'5 1(5/#46 2*10'5



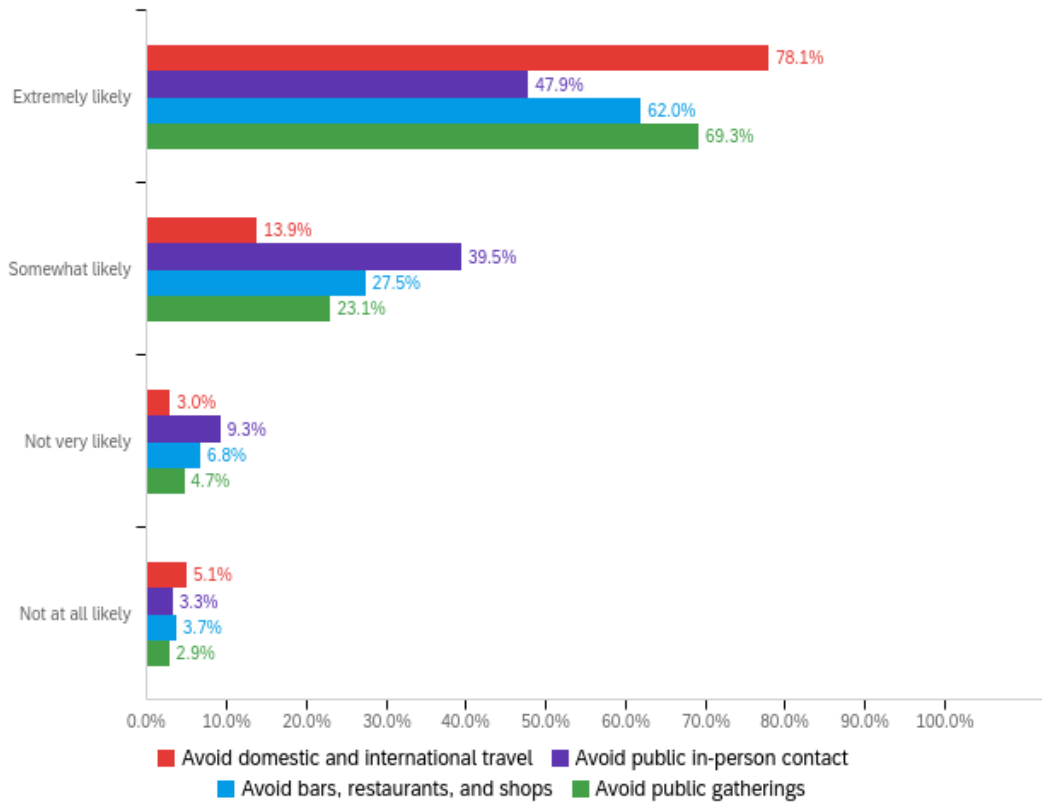
1 ;17 75' #0; 1(6*' (1..19+0) 51%+#. /'&+# #6 .' #56 10%' # 9''-

< '.19 +5 # .+56 1()41725 #0& +056+676+105 +0 51%+'6; .'#5' 6'.. 75 6
;17 64756 14 &+564756 /'/\$'45 1(6*'5')41725 14 +056+676+105

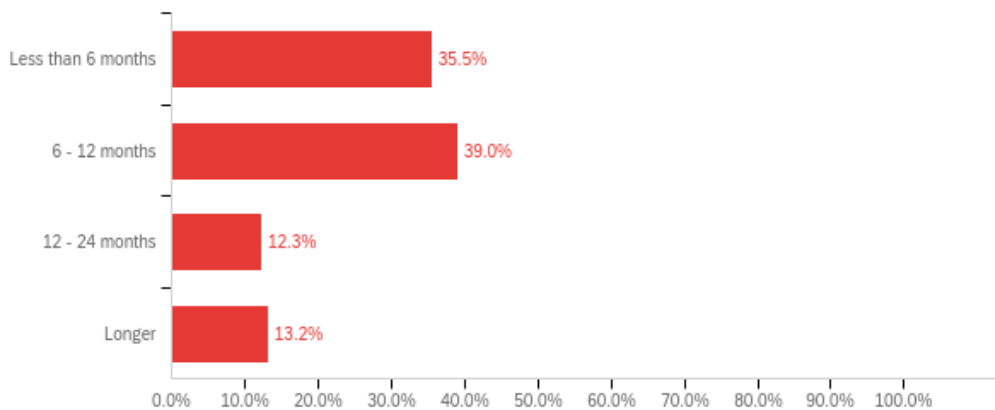
19 1(6'0 *#8' ;17 4'#& .+56'0'& 61 14 9#6%*'& 0'95 4'.#6'& 61 6*' 2#0&' /+% 18'4 6*' 2#56 9''-



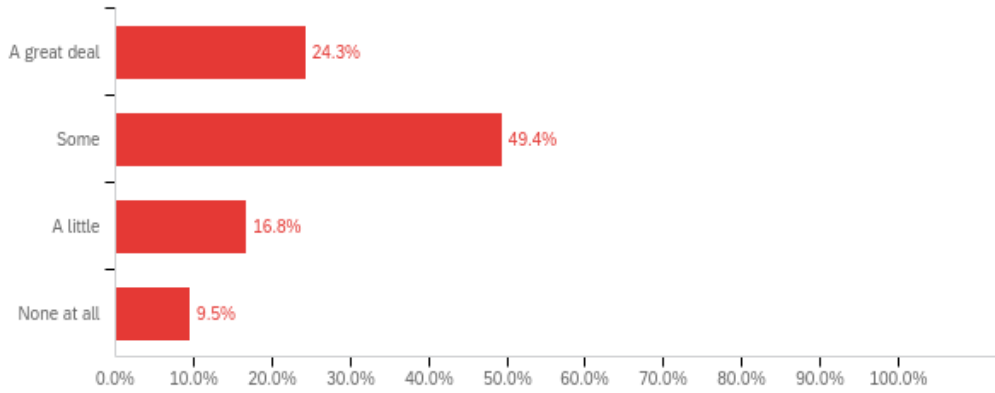
19 .+ -'.; +5 +6 6* #6 ;17 9+.. '0)#)' +0 6*' (1..19+0) # %6+105 (14 6*' 0':6
 '8'0 +(;17 #4'0=6 5+% -



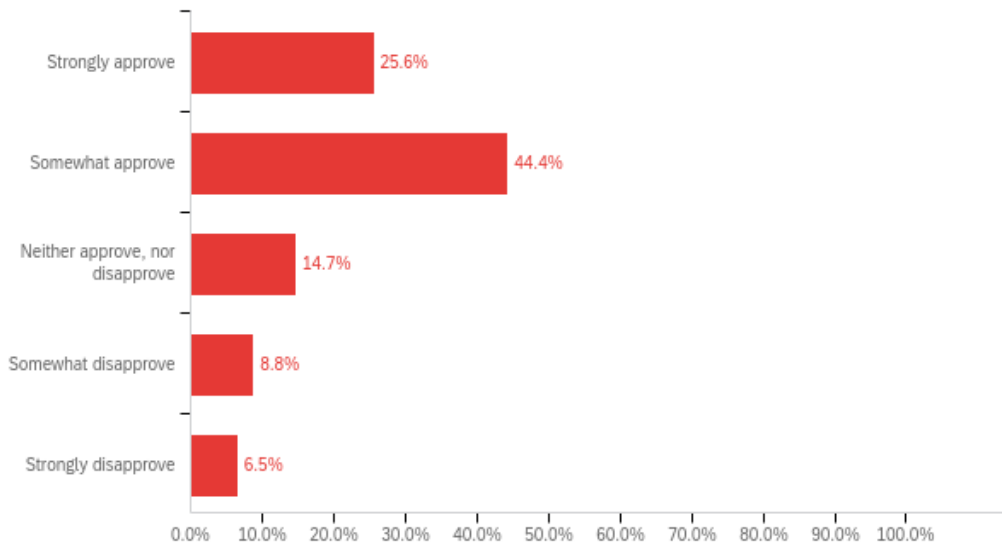
14 *19 /#0; /14' /106*5 #4' ;17 9+..+0) 61 '0)#)' +0 51%+#. &+56#0%+0)
 #5 4'37+4'& 61 5612 6*' 524' #& 1(57%* #5 #81+&+0) 2'4510#. %106#9
 27\$.+ %)#6*'4+0)5 #0& %419&'& 2.#%'5



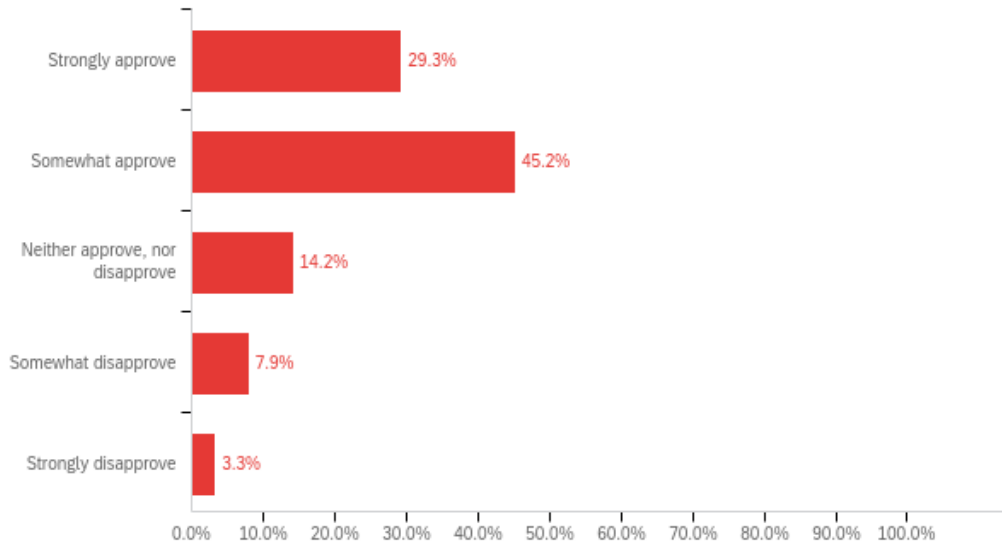
19 / 7% * % 10 (+ & '0%' & 1 ; 17 * # 8' + 0 6 *' (' & '4# .) 18' 40 / '06 61 % 10 6 # + 0 6 *
 2 # 0 & ' / + %



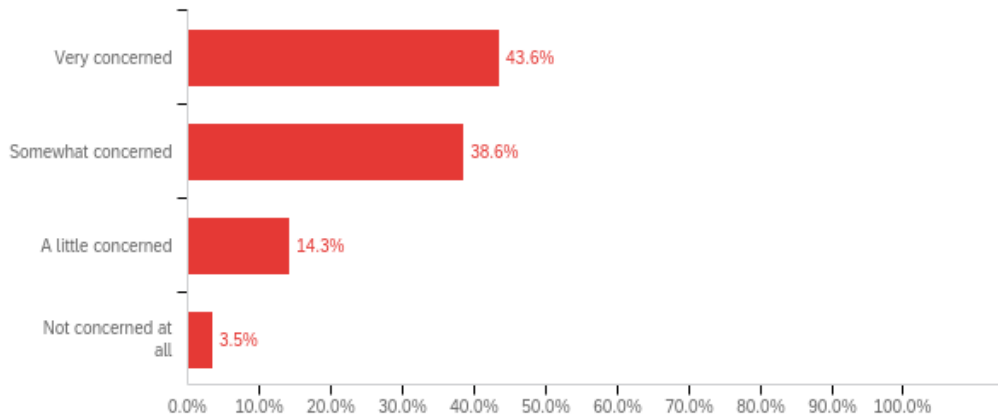
1 9 * # 6 ' : 6 ' 06 & 1 ; 17 # 22 4 18' 14 & + 5 # 22 4 18' 1 (6 *' (' & '4# .) 18' 40 / '06 5 * ;
 1 (6 *' 2 # 0 & ' / + % 5 1 (# 4



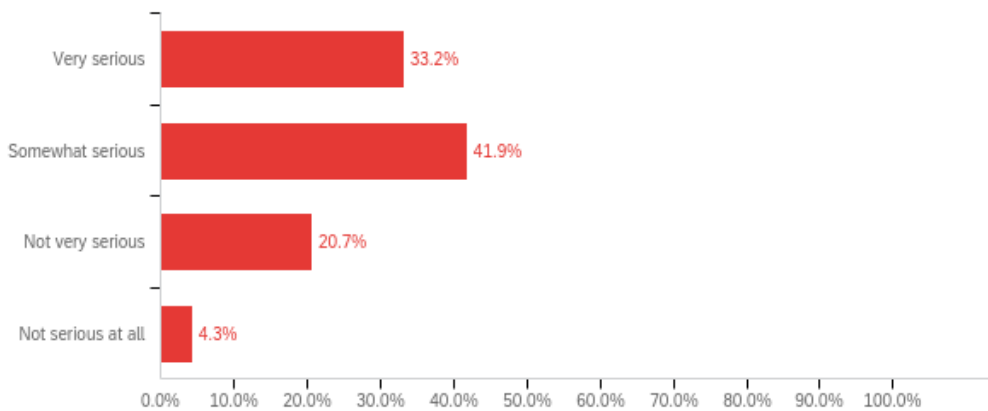
1 9 * # 6 ' : 6 ' 0 6 & 1 ; 1 7 # 2 2 4 1 8 ' 1 4 & + 5 # 2 2 4 1 8 ' 1 (; 1 7 4 2 4 1 8 + 0 % + # . 1 4 6 ' 4 4) 1 8 ' 4 0 / ' 0 6 5 * # 0 & . + 0) 1 (6 * ' 2 # 0 & ' / + % 5 1 (# 4



1 9 % 1 0 % ' 4 0 ' & # 4 ' ; 1 7 # \$ 1 7 6 6 * ' 2 # 0 & ' / + %

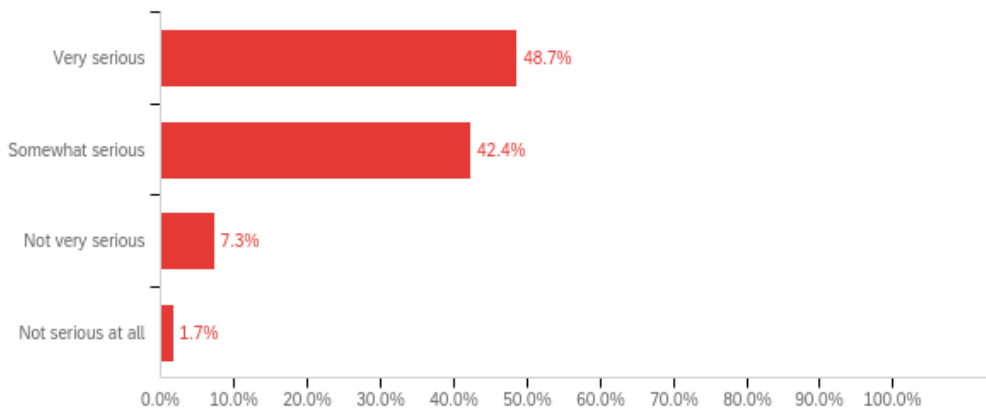


1 9 5 ' 4 + 1 7 5 1 (# 6 * 4 ' # 6 & 1 ; 1 7 6 * + 0 - + 5 6 1 " * ' # . 6 *

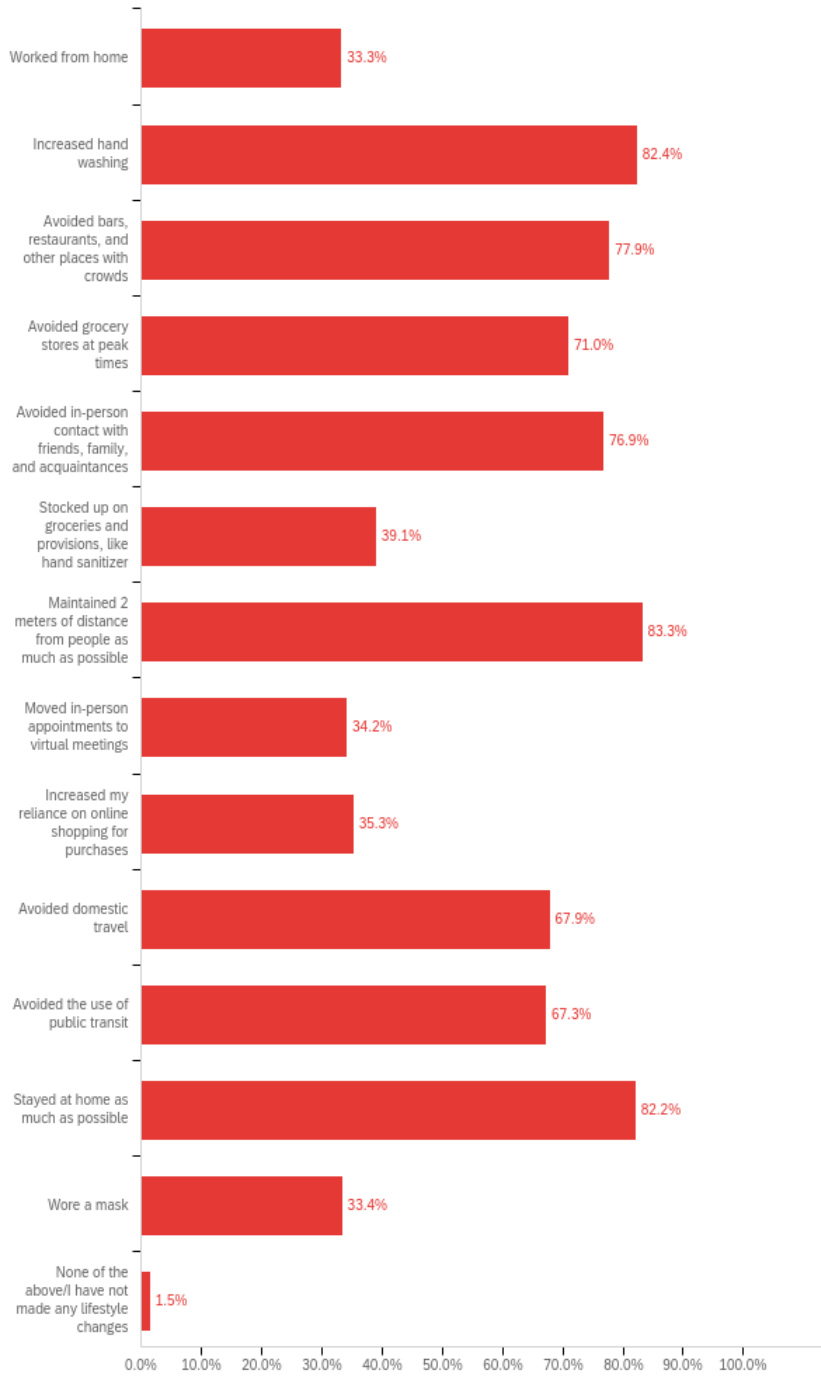


19 5'4+175 1(# 6*4'#6 &1 ;17 6*+0- 6*'

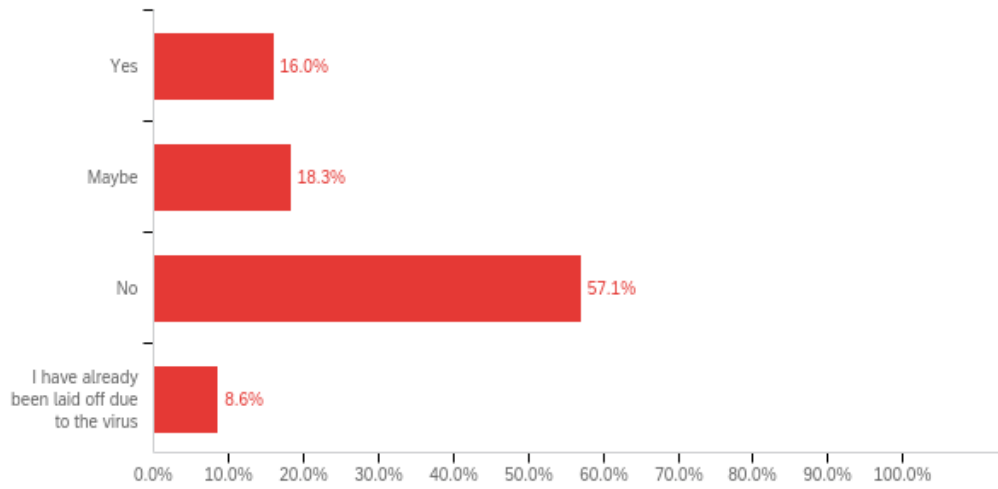
+5 61 6*' *'#.6* 1(#0#&



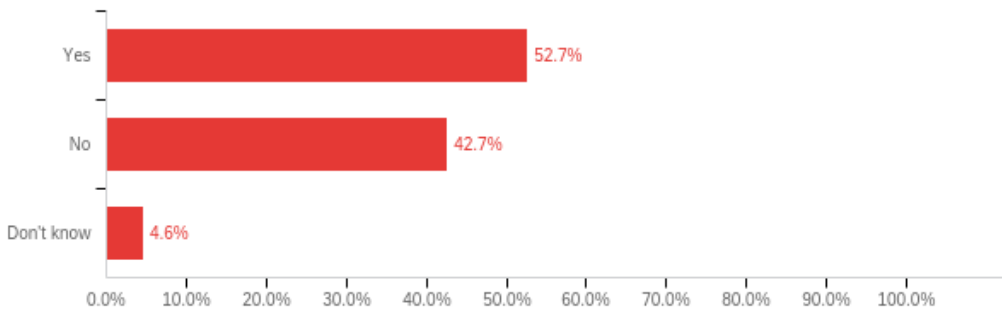
8 '4 6 *' 2 #56 9 ''- 9 *+%* 1(6*' (1..19+0) # %6+105 *#8' ;17 6#-'0
 2 #0 &' /+% . '#5' 5'.'%6 #.. 6*#6 #22.;



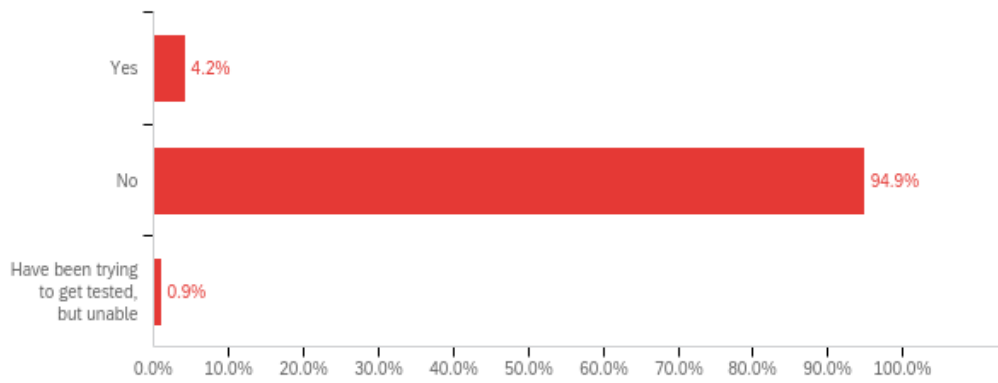
1 ; 17 * # 8 ' # , 1 \$ 6 * # 6 + 5 # 6 4 + 5 - \$ ' % # 7 5 ' 1 (



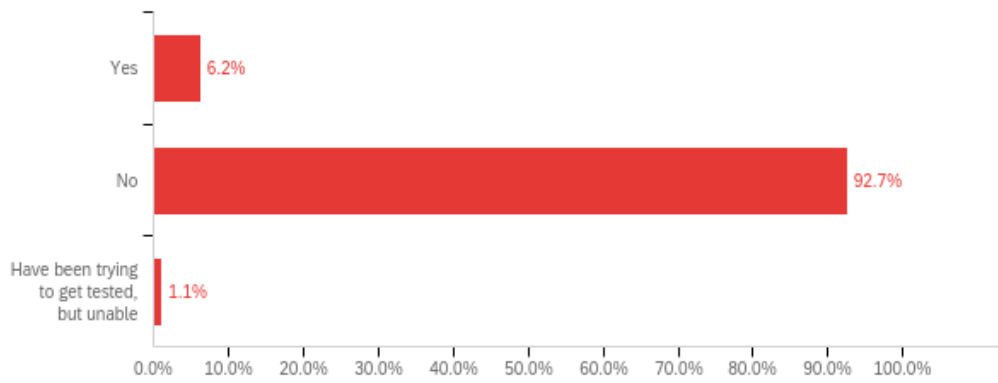
1 ; 17 - 0 1 9 5 1 / ' 1 0 ' 2 ' 4 5 1 0 # . . ; 9 * 1 * # 5 . 1 5 6 6 * ' + 4 , 1 \$ # 5 # 4 ' 5 7 . 6 1 (



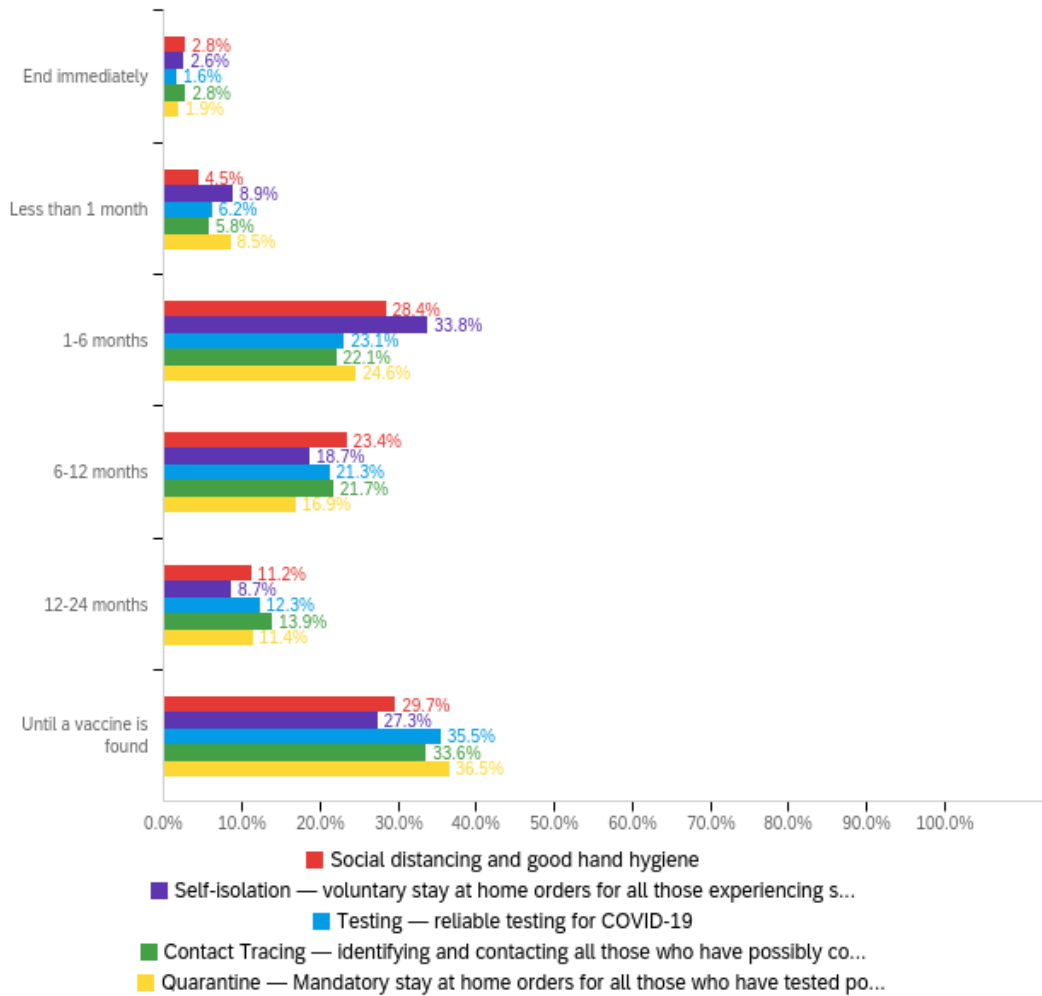
8' ; 17 \$ ' ' 0 6 ' 5 6 ' & (1 4



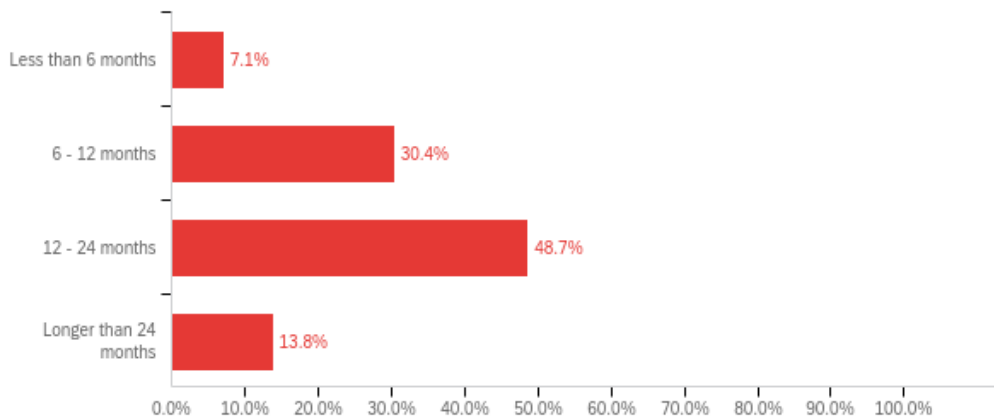
5 5 1 / ' 1 0 ' + 0 ; 1 7 4 * 1 7 5 ' * 1 . & \$ ' ' 0 6 ' 5 6 ' & (1 4



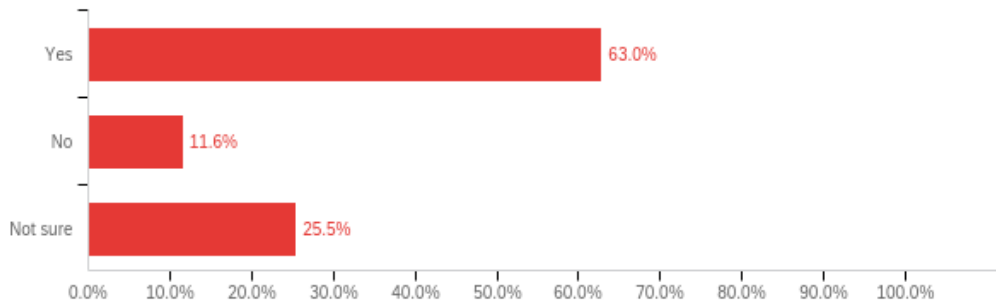
14 * 19 .10) & 1 ;17 6*+0- +6 9+.. \$' 0%'55#4; 61 -'2 '#%*
 % 10641.



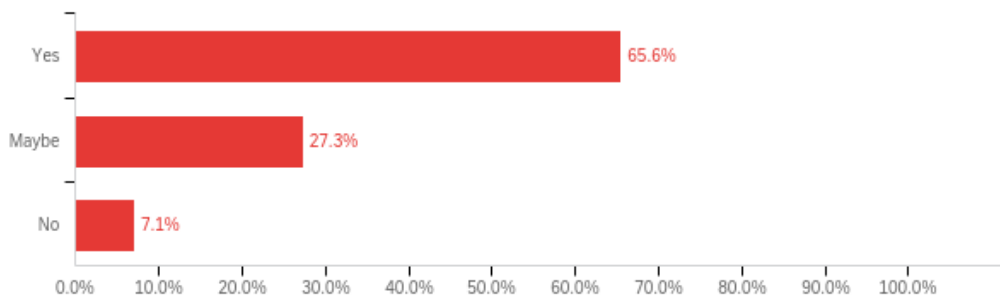
19 .10) & 1 ;17 6*+0- +6 9+.. \$' 706+. 9' *#8' # 8#%



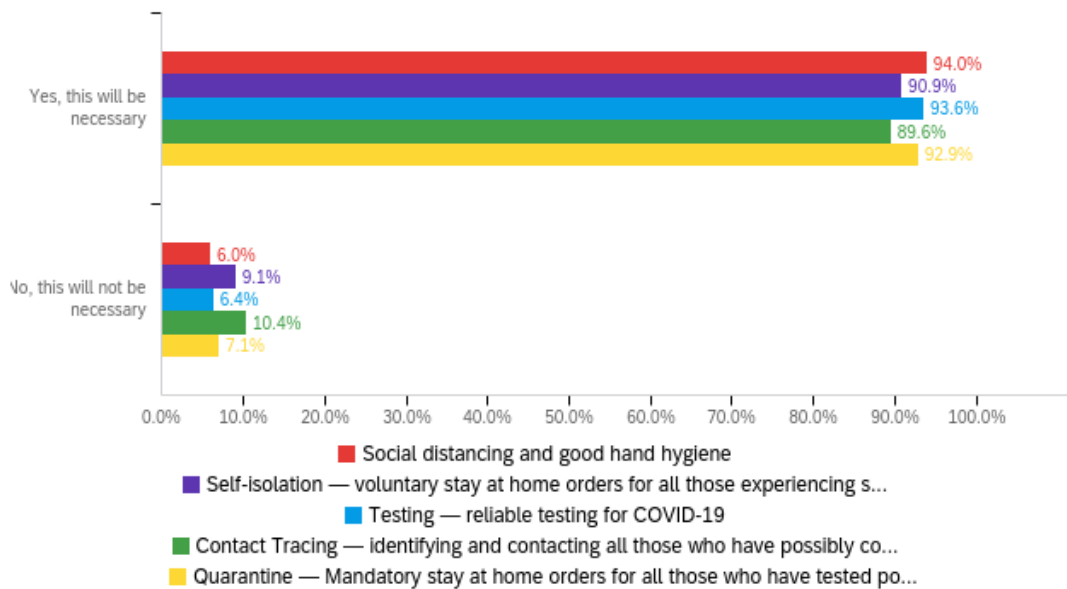
! * ' 0 # 8 # % % + 0 ' + 5 & + 5 % 1 8 ' 4 ' & 9 + . . ; 1 7 6 # - ' + 6



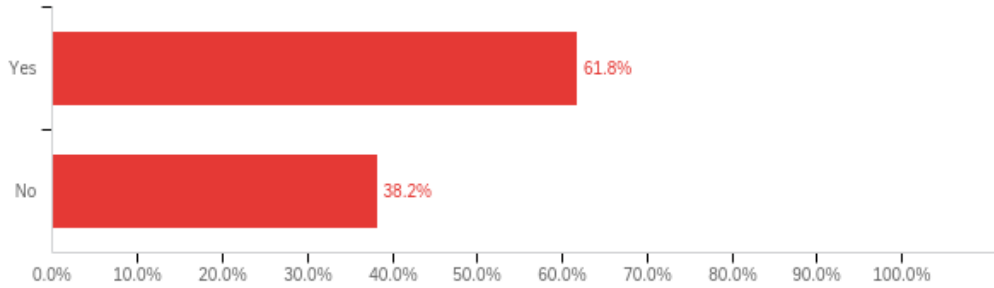
! 1 7 . & ; 1 7 4 ' % 1 / / ' 0 & 6 * # 6 1 6 * ' 4 5 & 1 6 * ' 5 # / / '



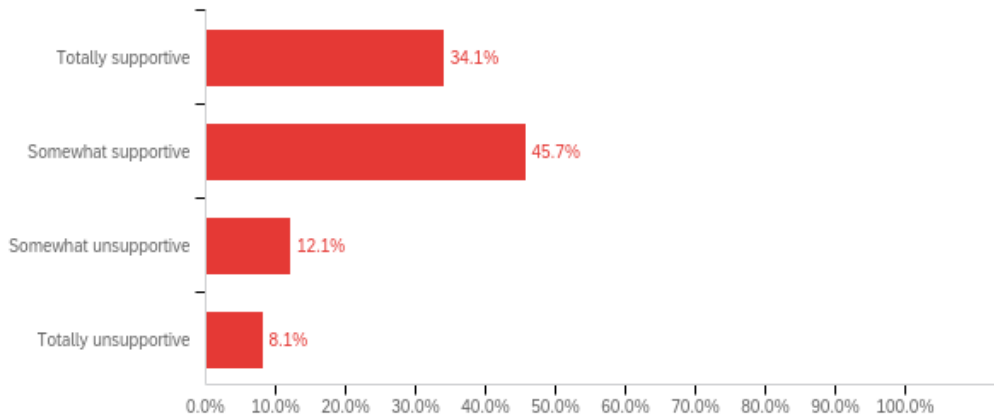
0 6 * ' # \$ 5 ' 0 % ' 1 (# 8 # % % + 0 ' 1 4 ' ((' % 6 + 8 9 * 6 # 4 ' # 6 1 / ' 0 1 6 7 5 6 (* 1 4 0 - + 6 9 + . . \$ ' 0 ' % ' 5 5 # 4 ; 6 1 % 1 0 6 + 0 7 ' & 1 + 0)



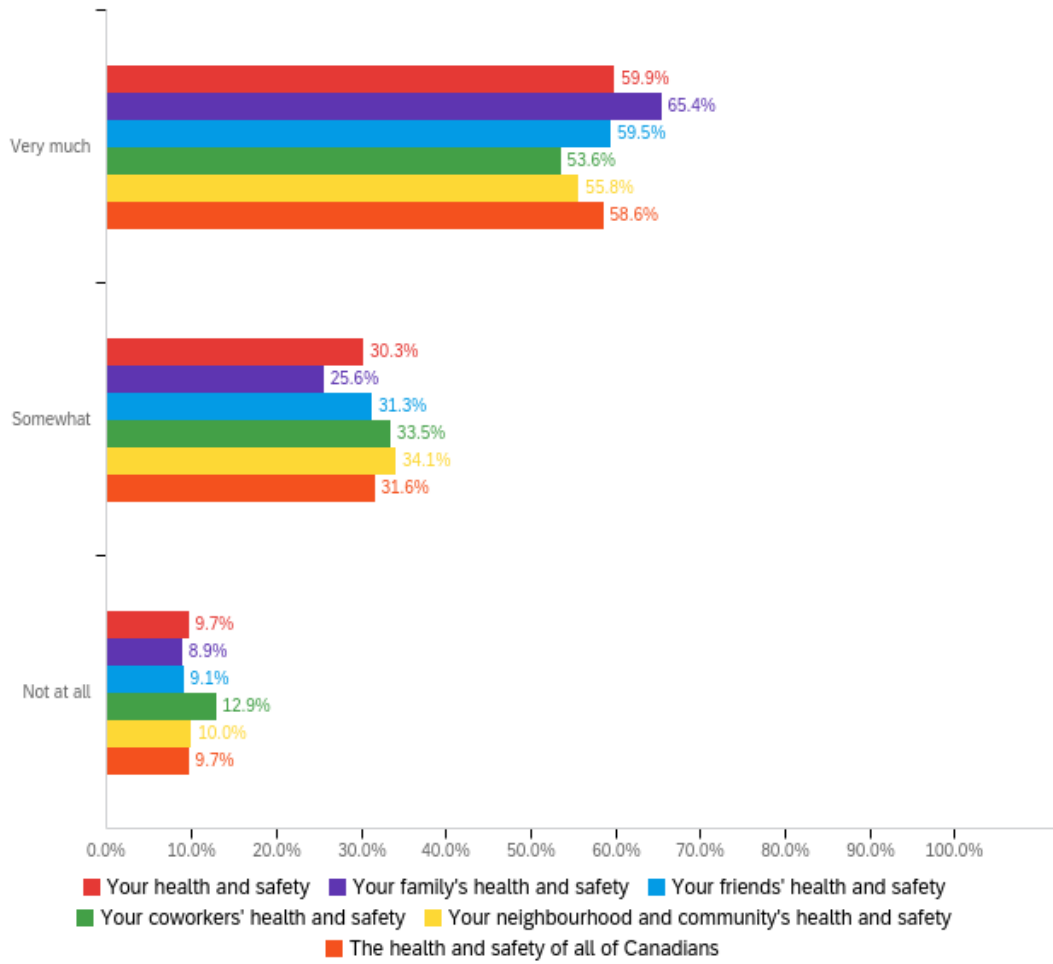
106#%6 64#%+0) +5 6*' 241%'55 1(64#%-+0) &190 #0& 6'56+0) #.. 2'45
 \$''0 +0 %106#%6 9+6* #0 +0('%6'& 2'4510 744'06.; 6*+5 +5 &10' \$; 27\$.+%
 9*1 +06'48+'9 #0 +0('%6'& 2'4510 #0& 6*'0 2*10' '#%* 2'4510 9*1 *' 5*' 4'%#..
 #8' \$''0 +0 %106#%6 9+6 18'4 6*' 24'8+175 &#;5 !'4' ;17 (#/+.#4 9+6*
 64#%+0) 914-5 \$(14' %1/2.'6+0) 6*+5 5748';



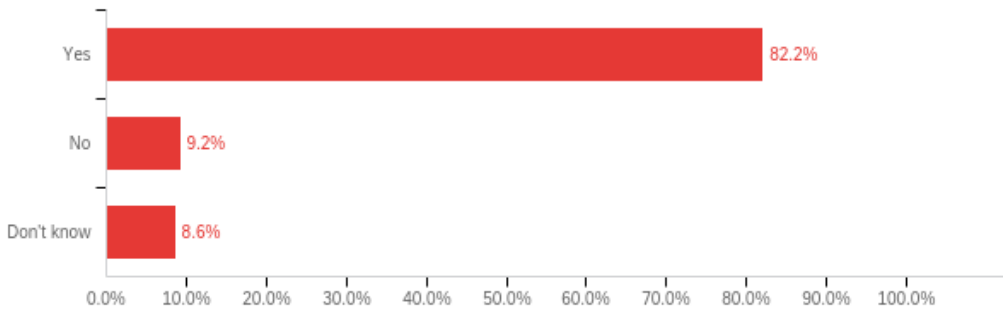
(6*' 64#%-+0) %#2#\$+.+6+'5 1(5/#46 2*10'5 2418+&'& 27\$.+% *'#.6* 1(
 #\$.+.+6; 61 #010;/175.; #0& #761/#6+%#..; 016+(; #.. 6*15' 9*1 *#8' \$''0 %.15
 9*1 6'56'& 215+6+8' (14 *19 5722146+8' 917.& ;17 \$' 1(75+0) 6*+5 %
 #0#&#



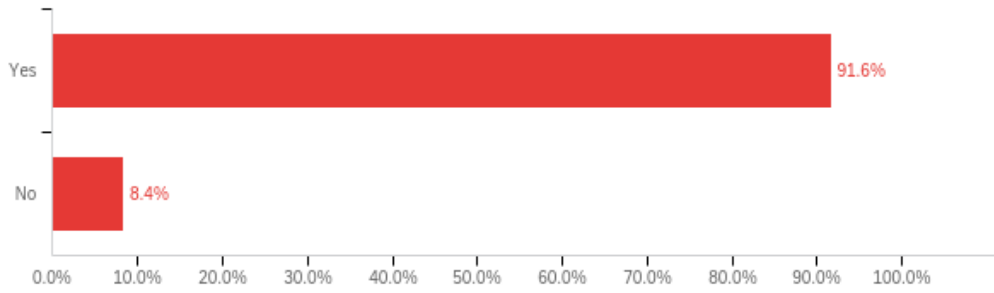
(6*+5 6'%*01.1); *.2'& 61 &'%4'#5' 6*' 524'#& 1((1..19+0) %105+&'4#6+105 /16+8#6' ;17 61 75' +6



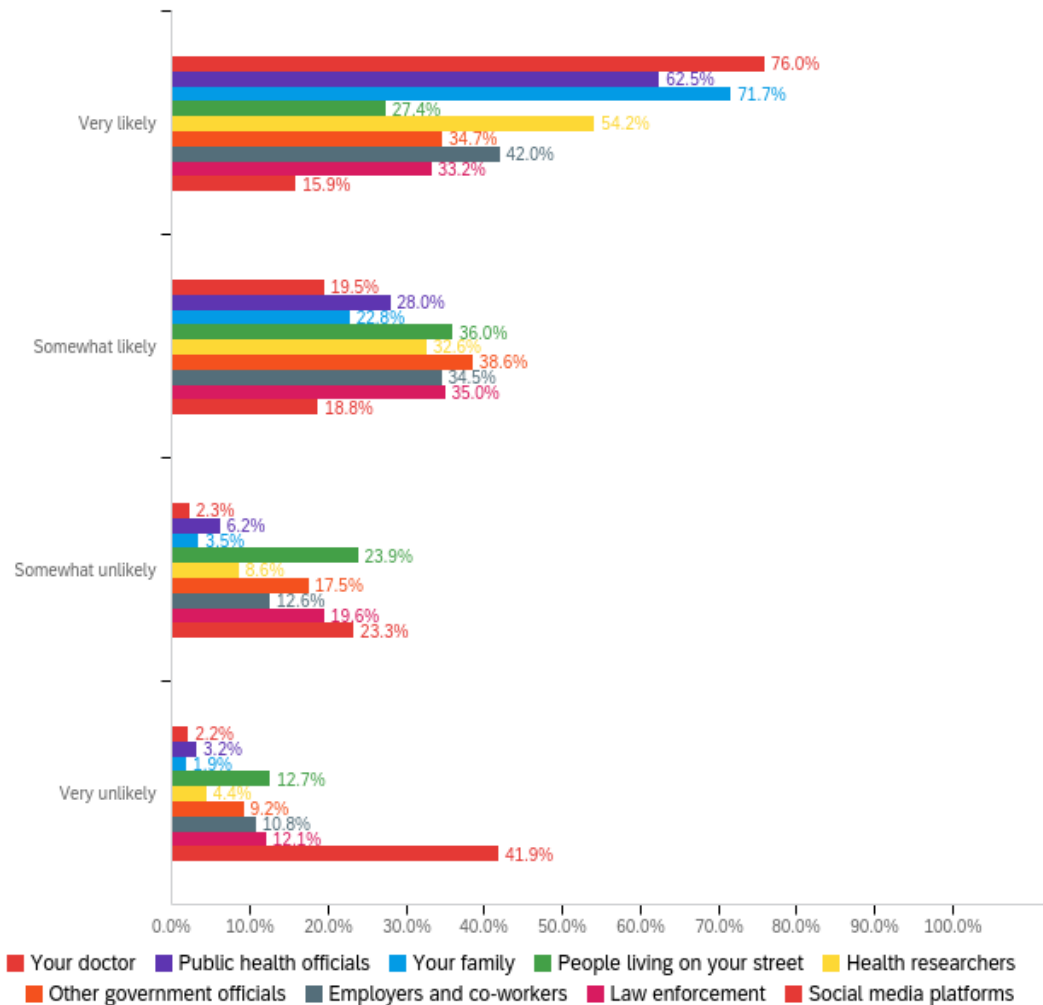
!17.& ;17 9#06 61 \$' #761/#6+%#..; 016+(+'& +(;17 9'4' ': 6'56'& 215+6+8' 51 6*#6 ;17 %17.& \$' 4#2+&.; 6'56'&



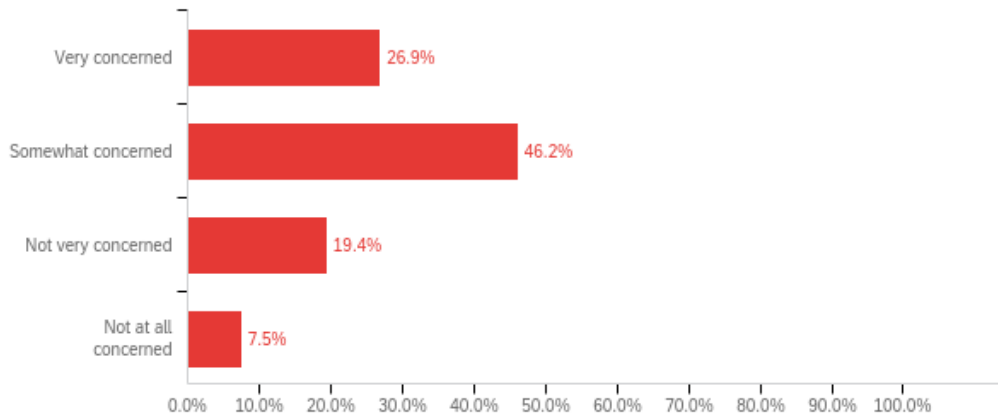
(;17 9'4' 6*'0 6'56'& 917.& ;17 '\$' 9+..+0) 61 #010;/175.;
 6*#6 16*'45 %17.& #.51 '\$' #761/#6+%#..; 016+(+'& +(6*'; 0''& 61 '\$' 6'56'&



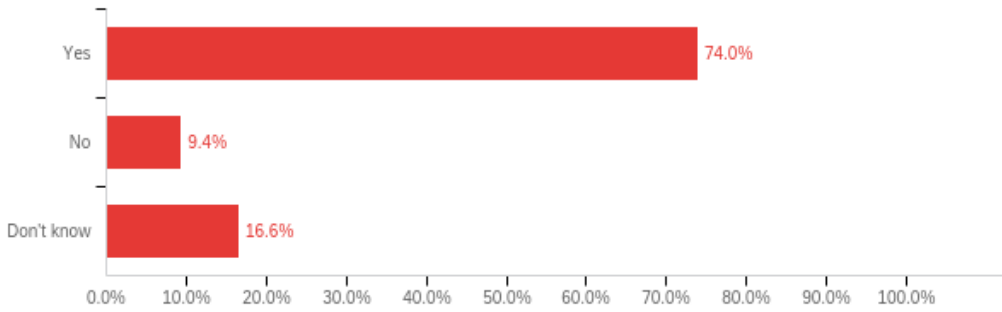
19 .+-.'.; 917.& '\$' 61 5*#4' 6*+5 5#/' +0(14/#6+10 9+6* '#%* 1(6*' (1..19
 14)41725 +(;17 -0'9 6*+5 +0(14/#6+10 917.& '\$' -'26 %10(+&'06+#.



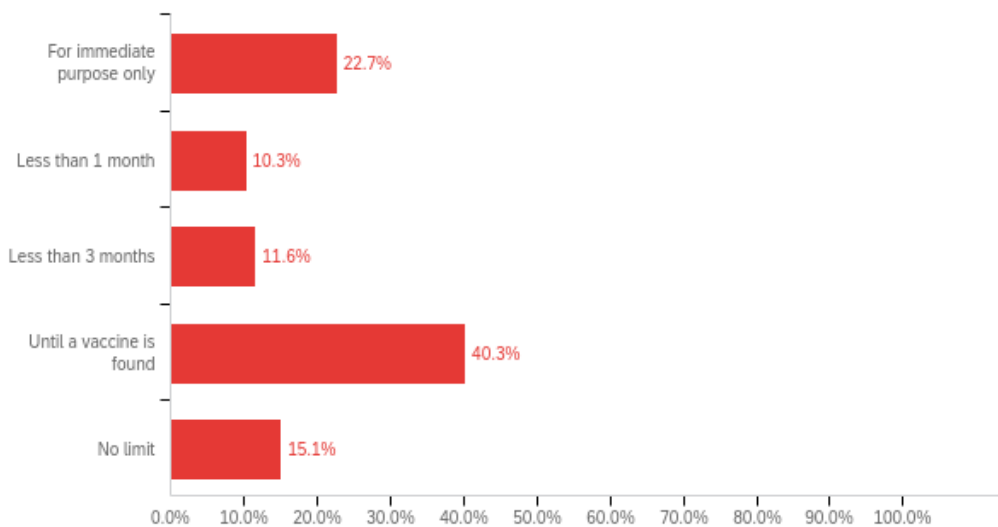
19 % 10% '40' & #4' ; 17 6*#6 5*#4+0) 6*+5 +0(14/#6+10 917
 + &'06+(+'& #0& 14 &+5%4+/#6'& #)#+056



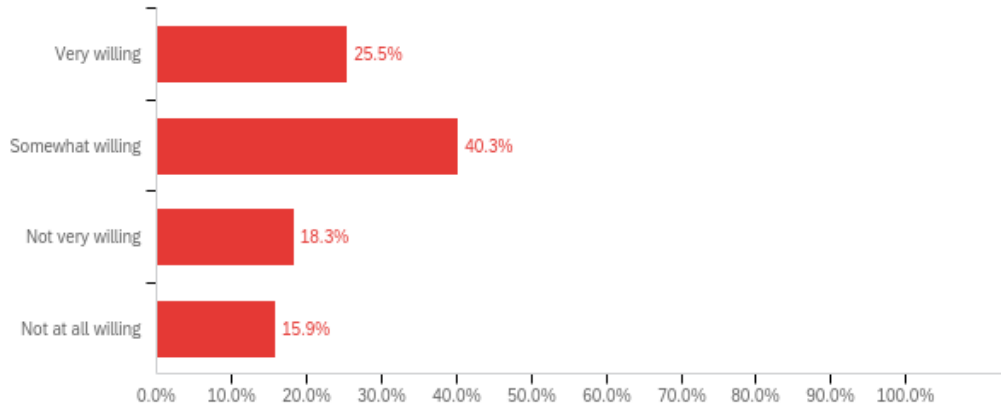
(; 17 % 17.& \$' %'46# +0 6*#6 #0; 6*+0) 6*#6 %17.& +&'06+(; ; 17 9#5 (7.. ;
 +0(14/#6+10 917.& ; 17 \$' 9+..+0) 61 #..19 +6 61 \$' 5#8'& (14 75' \$; &1%6145
 4'5'#4%*'45 #0& 16*'4 /'&+%#. 5%+'06+565 9*1 #4' 24'2#4+0) (14 6*'0':6 2#0



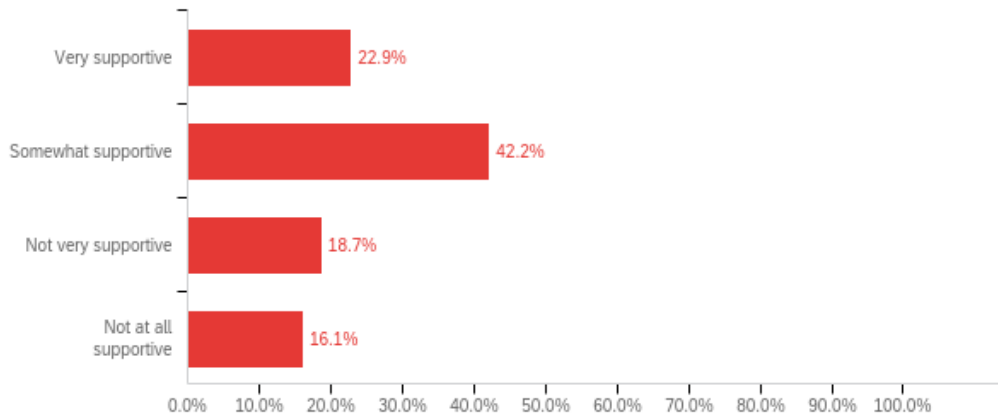
19 .10) 5*17.& +6 \$' 2155+\$. ' (14 6*+5 +0(14/#6+10 61 \$'



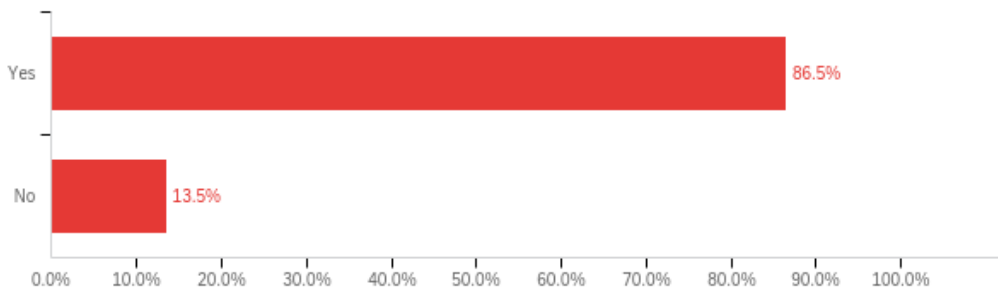
19 9+..+0) 9 17.& ;17 \$' 6 1 +056#.. #0 #22.+%#6+10 10 ;1
 .1%#6+10 18'4 6*' 24'8+175 &#;5 (14 75' \$; 27\$.+% *'#.6* 1((+%+#.5



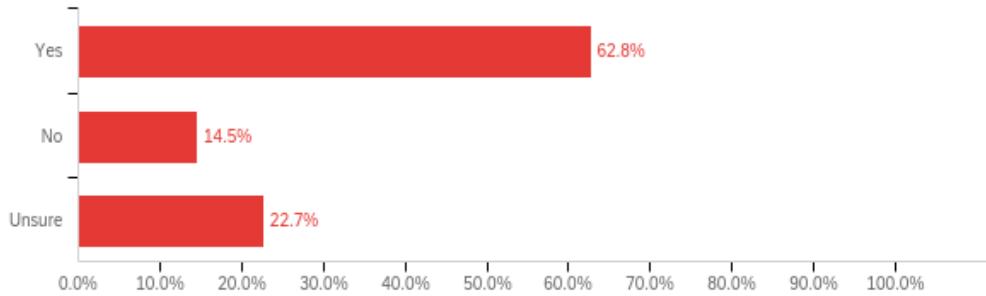
0 51/' %17064+'5 +056#..#6+10 1(6*+5 #22.+%#6+10 +5 /#0ɦ 19
 9 17.& ;17 \$' (14 6*+5 61 \$' 6*' %5' +0 #0#&#



(;17 6'56'& 215+6+8' (14 &1 ;17 6*+0- ;17 5*17.& \$' 4'37+4'& 61
 #010;/175.; 5*#4' ;174 .1%#6+10 *+5614; (41/ 6*' 24'8+175 691 9''-5 +0 14&'4
 +&'06+(;+0) 6*15' 9*1 #4' #6 4+5- 1(+0('6+10 \$'%#75' 6*'; 9'4' 0'#4 ;17 51
 \$' 4#2+&. ; 6'56'&



'%'06.; 7564#.#*#5 +0641&7%'& # %106#%6 64#%+0) #22.+%#6+10 (1
 9#5 &190.1#&'& /14' 6*#0 /+..+10 6+/'5 +0 6*' (+456 9''- 0&'4 7564#.#+0 .
 9*1 8+1.#6'5 16*'45 24+8#6' # 10 6*' #22 +5 57\$,%'6 61 5'8'4' (+0#0%+#.
 ;17 \$' /14' 9+..+0) 61 75' # %106#%6 64#%+0) #22.+%#6+10 (14 5/#46 2*10'5
 9'4' +0 2.#%'



19 /7%* &1 ;17 #)4'' 14 &+5#)4'' 9+6* '#%* 1(6*' (1..19+0) 56#6''/065

