YOUTH SCIENCE SURVEY

Final Report

Canada Foundation for Innovation

2021-12-03

INNOVATION
Canada Foundation for Innovation
Fondation canadienne pour l'innovation

Acfas Faire avancer les savoirs

Ipsos

Contents

Background

The Canada Foundation for Innovation, in partnership with Acfas, conducted a survey that examines the attitudes of youth toward science, as well as the conditions and people who shape them. The overarching research objective is to shed light on the relationship of Canada's youth to science and their preferred sources of scientific information.

KEY RESEARCH OBJECTIVES:

- What sources of information are youth (defined as ages 18-24) accessing?
- Which sources have the greatest influence on youth's attitudes and behaviours toward science-related issues as reflected by the following topics:
  - COVID-19 vaccine safety
  - sustainability/recycling
  - climate change
  - importance of STEM for the future

Survey Methodology

WHO WAS INTERVIEWED? AND HOW?

- A nationally representative sample of Canadian youth ages 18-24.
  - A total of n=1500 youth were surveyed.
  - The data has been weighted by age, gender, and region to reflect Statistics Canada 2016 Census data.
  - The sample for the survey was drawn from Ipsos' proprietary online panel.
- The accuracy of online surveys using panel sample is measured using a credibility interval. For this survey, the overall data is accurate to within +/-2.9, 19 times out of twenty. The credibility interval will be larger for sub-groups of the data.

FIELDWORK DATES

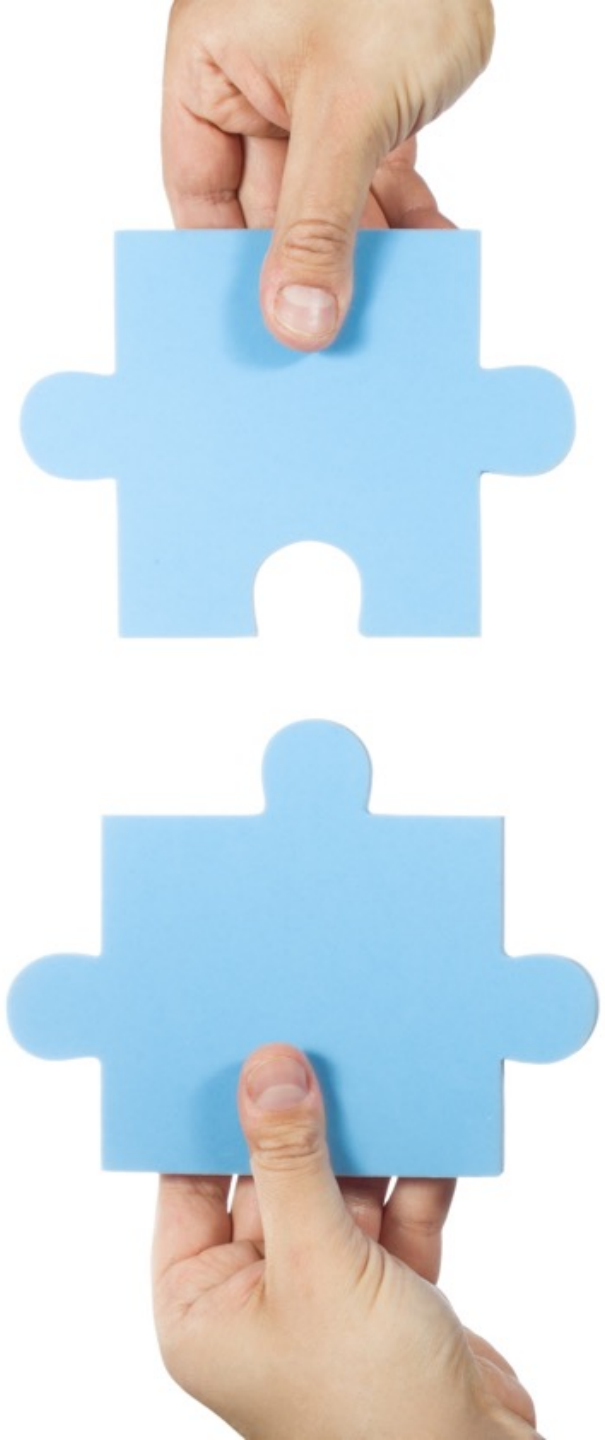
- October 12 to 26, 2021

NOTES

Throughout the report totals may not add up to 100% owing to rounding or because the question allowed for multiple responses.

For some questions, the data has been re-based to exclude don't know and/or not applicable responses. This is indicated on the relevant slide. The purpose of rebasing is to facilitate a better comparison between statements with unequally sized don't know or n/a percentages

KEY FINDINGS



Science matters

Majorities of youth hold opinions consistent with science

- 68% agree COVID-19 vaccines approved for use in Canada are safe
- 63% agree that single use plastics should be banned
- 55% disagree that curbing the use of fossil fuels will not help reduce the impacts of climate change
- 57% disagree it is not critical for Canadian politicians and governments to rely on science when making policy decisions for the benefits of Canadians (e.g., health, wellbeing, economy)

influences

...but many are influenced by other factors

Many come to a view of science-led issues that is consistent with science despite coming across influences that are NOT aligned with science

The most impactful influences on youth are peers and people around them, news and media and their own beliefs or culture

influencers

Social media influencers holding anti-science views are prevalent and pervasive

73% of youth follow at least one social media influencer that has expressed anti-science views*

*Represents the calculated aggregate "agree" score across 3 statements: "At least one of the influencers I follow…"

- …has expressed the view COVID-19 vaccines approved for use in Canada are not safe or not safe for certain people (within the approved age group of 12 and up
- …has expressed climate change is not the result of human behaviours and activities
- …argues against using single-use plastic

at risk

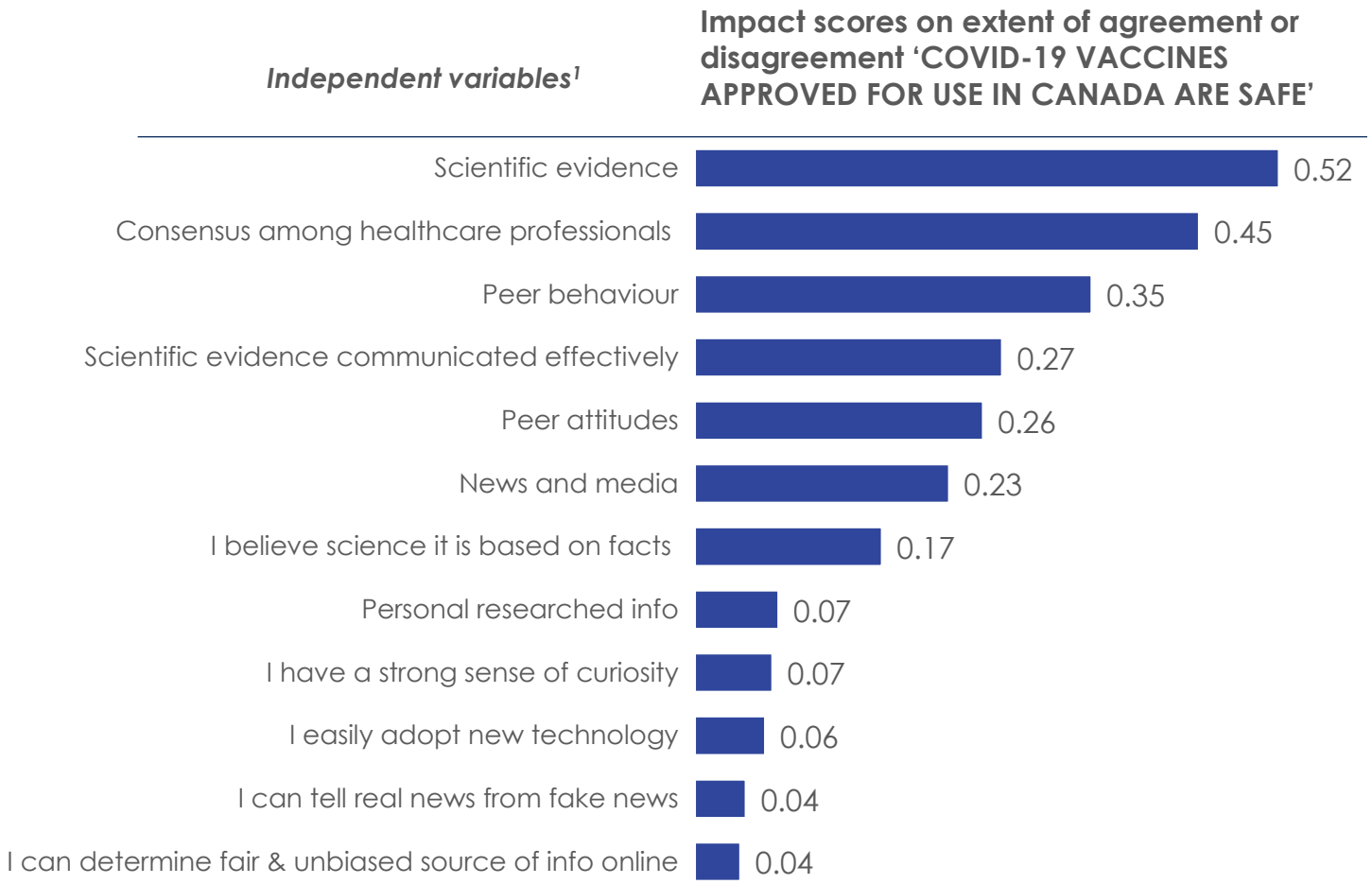
Young males are at greater risk of supporting views that do not align with science

- 54% of men 18-24 strongly agree that at least one of the social media influencers they follow has expressed anti-science views. (vs.46% of women)
- 37% of men 18-24 agree it is not critical for Canadian politicians and governments to rely on science when making policy decisions for the benefits of Canadians (e.g., health, wellbeing, economy (vs. 24% of women)

THE EVIDENCE

Science is the #1 influence on youth views of COVID-19 vaccine safety, but other non-science factors also have influence

- Youth opinions can be influenced by many factors. The survey identified 7 main factors.
- Of them, scientific evidence is the greatest or most powerful factor. For the science community and educators this must be reassuring.
- The second most powerful influence is the opinions of healthcare professionals (practitioners, not officials).
- Third is peer behaviour (if family and friend got the vaccine quickly).
- Fourth through seventh reflect how well youth feel the scientific evidence has been communicated, presumably in a way that they interpret as credible and consistent, peer attitudes or culture (my family and friends also think vaccines are safe), what the news or media are saying and a personal belief that science is based on facts.



IBN ANALYSIS WAS USED TO MODEL ATTITUDES – see Appendix for details

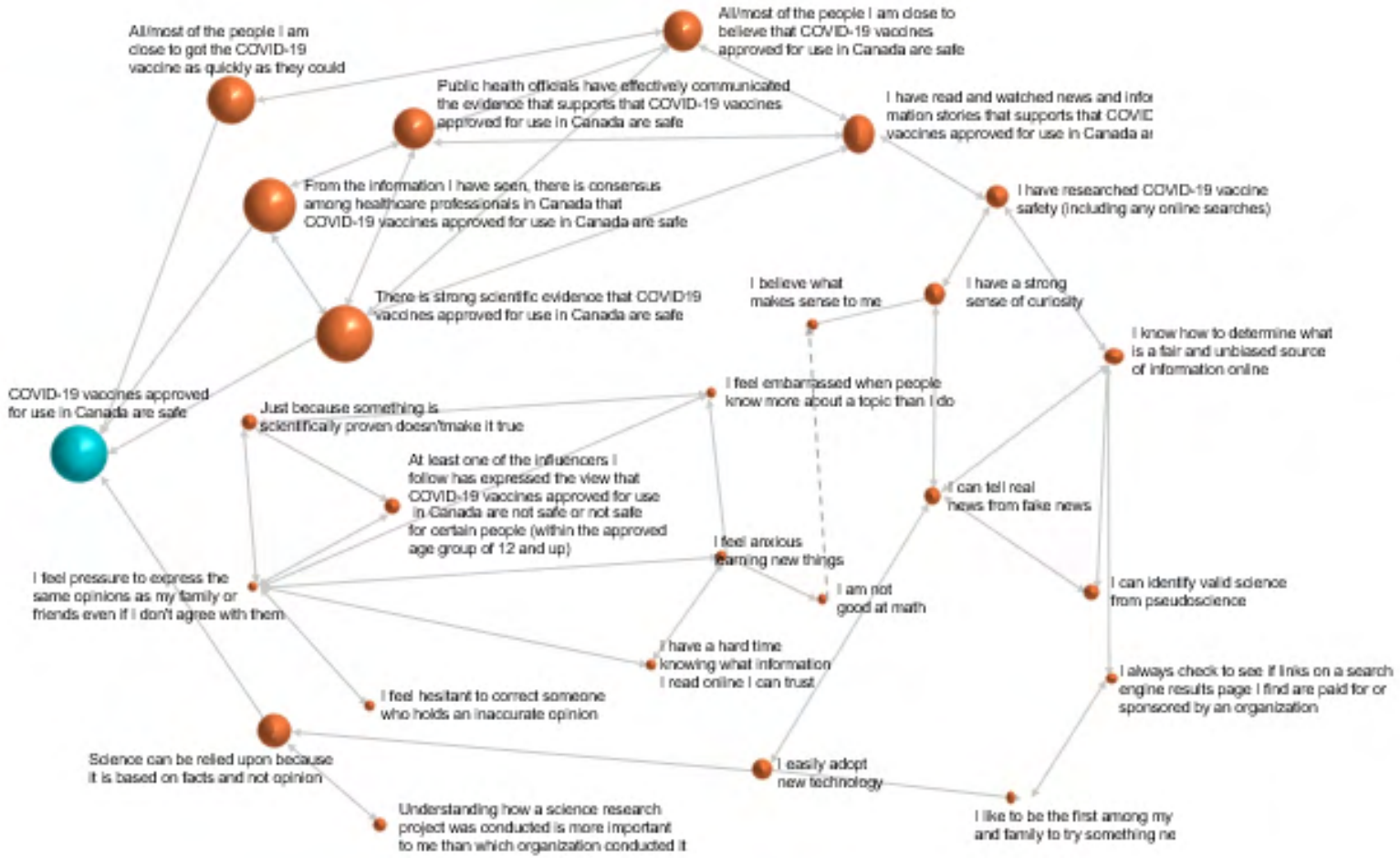
Impact scores:

Designed to be interpreted similar to regression coefficients – the impact score is the expected change in the outcome measure based on a 1-unit change in a specific driver

[1] Statements have abbreviated. The full statements, and the full list of independent variables included in the model are shown in the Appendix.

There are four direct paths to views of COVID-19 vaccine safety

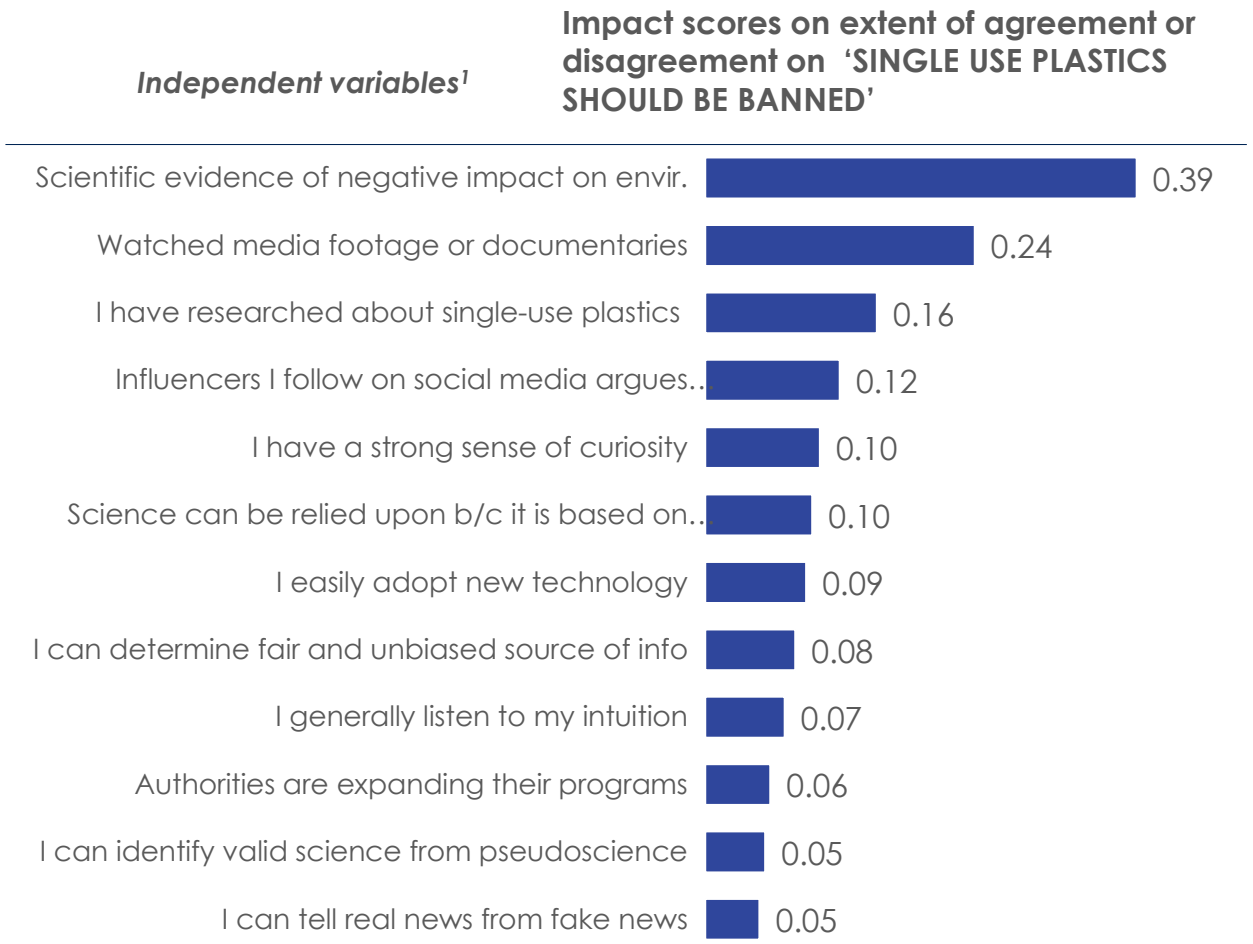
1. Scientific evidence supports safety
2. Whether family and friends got a vaccine
3. Consensus among health professionals
4. Belief that science can be relied upon because it is based on facts



- **What does the map show?** The map is a **visual aggregation of the most consistent links** between variables, across 500 separate, individual bootstrapped models
- **What do the circle sizes mean?** The circles (nodes) for each of the driver variables are sized to reflect the relative size of the driver impact (larger circles reflect larger impact scores). These are relative within the particular map and should not be compared with other studies.

Science is the #1 influence of youth views of single-use plastics, but other non-science factors also have influence

- Youth opinions can be influenced by many factors. The survey identified 6 main factors.
- Of them, scientific evidence is the greatest or most powerful factor.
- The second most powerful influence watching media and documentary footage on the issue.
- Third is personal research.
- Fourth is the is persuasiveness of social media influencers.
- Fifth and sixth are a strong sense of curiosity and belief that science can be relied upon because it is based on fact.



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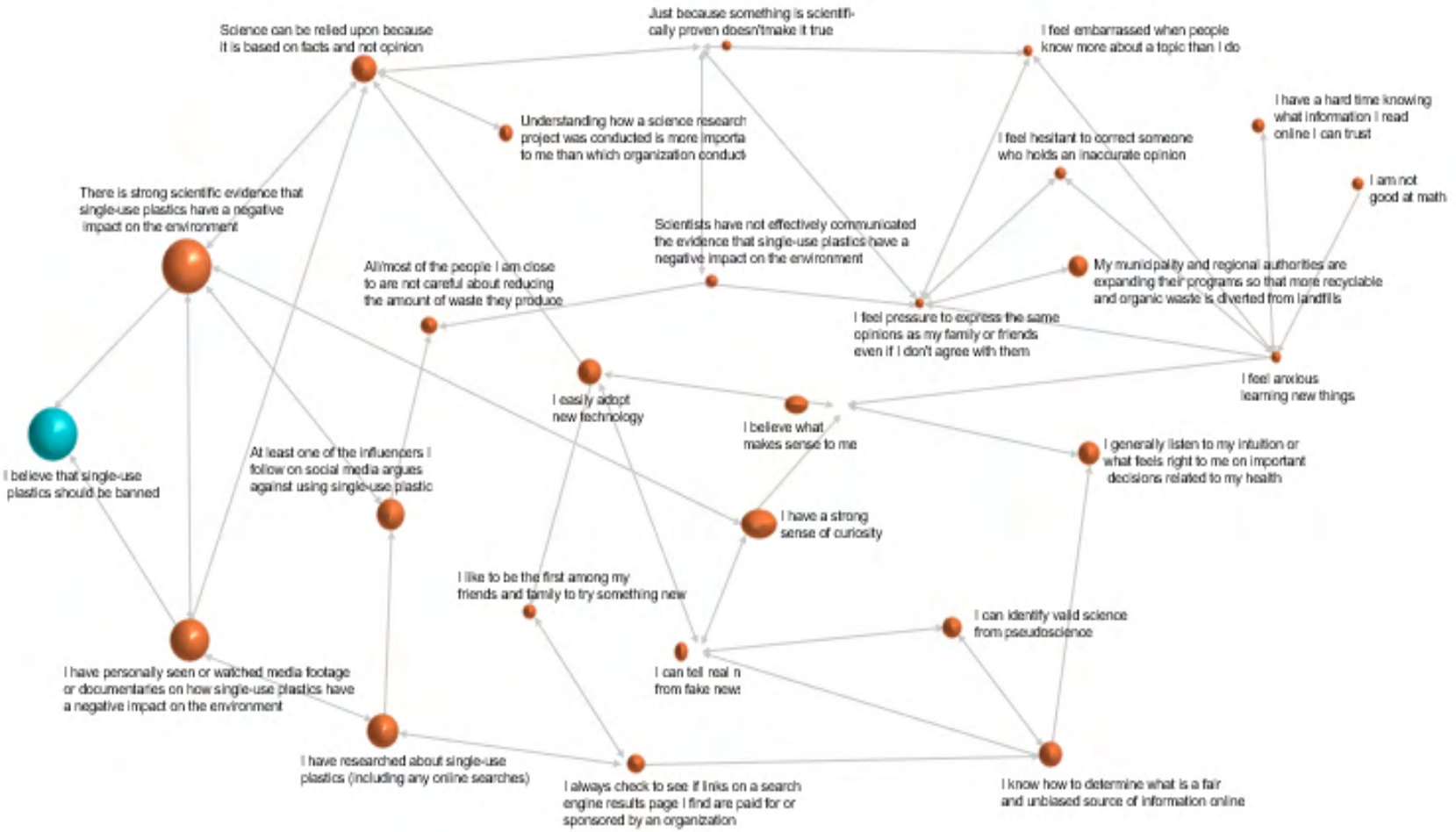
There are 2 direct paths to views of banning single-use plastics

1. Scientific evidence supports that single-use plastics have a negative impact on the environment
2. I have personally seen or watched media footage or documentaries on how single-use plastics have a negative impact on the environment



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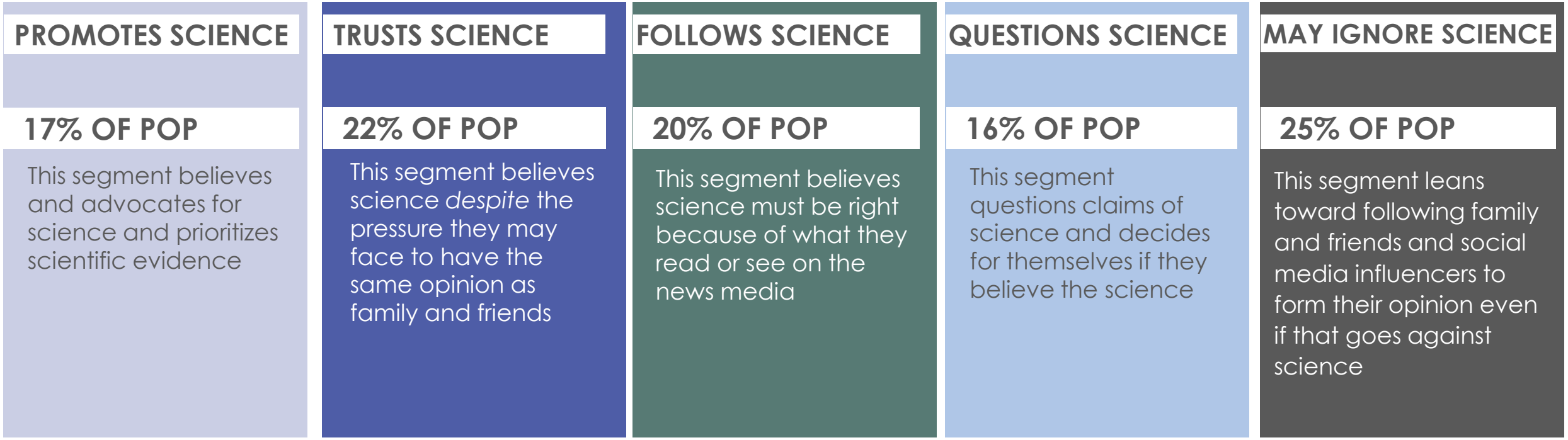
SEGMENTING YOUTH ON VIEWS OF SCIENCE

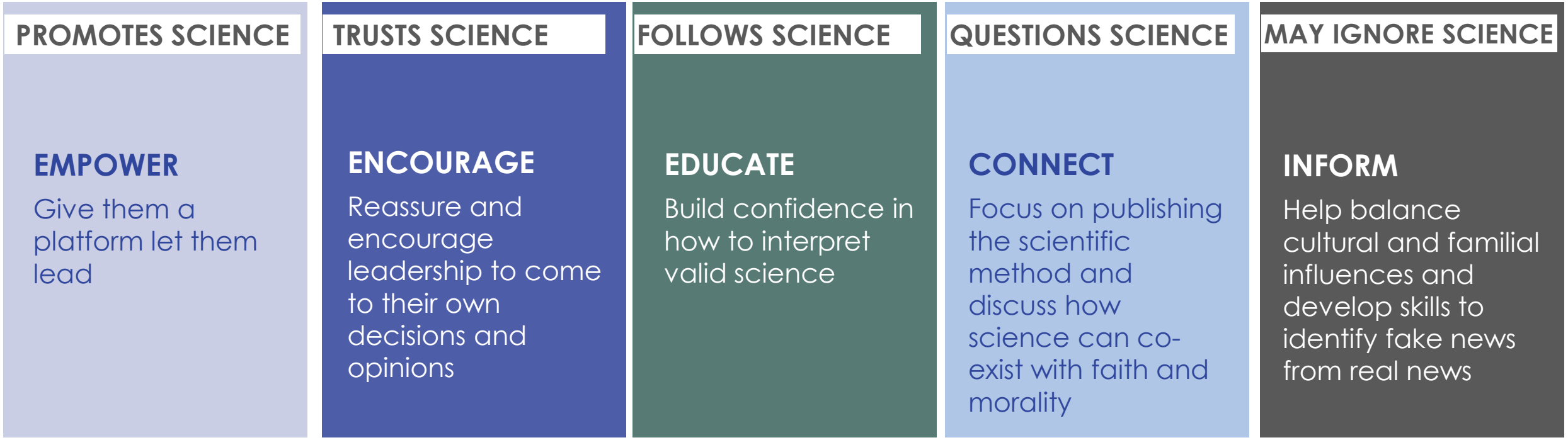
Youth attitudes toward science breakdown into 5 mindsets

- Mindsets collate around the direct links identified in the analysis



k-Means, Euclidean, Row-Centered, 80% PCA Variance Explained, 5 Segments

Potential interventions to strengthen science-led attitudes



PROMOTES SCIENCE

science advocate, interested in climate change

- 95% science can be relied upon because it is based on facts and not opinion
- 92% want companies to produce more environmentally friendly products
- 88% COVID-19 vaccines approved for use in Canada are safe
- 87% I can identify valid science from pseudoscience
- 87% there is strong scientific evidence that single-use plastics have a negative impact on the environment
- 2 out of 3 are pursuing a career in STEM

"Being a Masters student, I am exposed to the scientific community. I try and share things online that are accurate to spread factual information to my peers who do not have the same resources to seek out or critically examine information."

PROMOTES SCIENCE

17%

KEY DIFFERENTIATORS

- Consensus around the importance of science to lead social policy
- Consensus around the importance of science for the future
- 2 out 3 are pursuing a career in STEM
- Can tell real from fake news & valid science from pseudoscience
- Surrounds themselves with like-minded people

OPINIONS

- 82% disagree It is not critical for Canadian politicians and governments to rely on science when making policy decisions…
- 65% pay more (or would be willing to pay more)…to help curb the use of fossil fuels.
- 69% say a science career it is intellectually stimulating

SKILLS

- 91% easily adopt new technology
- 93% strong sense of curiosity
- Only 17% not good at math
- Only 10% feel pressure to express the same opinions as my family or friends even if I don`t agree with them.

INTERACTIONS W/SCIENCE

- 79% seek out science content
- 51% would read peer reviewed academic or scientific journals or papers if they wanted more info
- 52% read scientific journals or watch science programs

MEDIA/SOCIAL

- 82% on social media everyday
- More likely to watch YouTube than other segments
- More likely to listen to podcasts than other segments

DEMOGRAPHICS

- University educated (grad school)
- More likely to have parents who have grad degree
- Leans female
- Leans bisexual
- Leans atheist

TRUSTS SCIENCE

Struggles to be independent, leans toward science despite outside pressures

- 82% science can be relied upon because it is based on facts and not opinion
- 75% there is strong scientific evidence that COVID-19 vaccines approved for use in Canada are safe
- 73% COVID-19 vaccines approved for use in Canada are safe
- 65% single-use plastics should be banned
- 61% feel pressure to express the same opinions as my family or friends even if I don`t agree with them

"Young people have to be more open minded and seek out different pieces of information before forming an opinion, and get less "offended" when someone doesn't agree with it"

TRUSTS SCIENCE

22%

KEY DIFFERENTIATORS

- Science is a good field for people in your age group to go into as a career
- Disagrees - just because something is scientifically proven doesn`t make it true
- Feel pressure to express opinions of family and friends
- Hesitant to correct someone who holds an inaccurate view
- Embarrassed when people know more about a topic

OPINIONS

- 63% hesitant to correct someone who holds an inaccurate view
- 84% agree science is a good field for people in your age group to go into as a career

SKILLS

- 89% are good at math
- 61% have a hard time knowing what information online to trust

INTERACTIONS W/SCIENCE

- 69% easily adopt new technology
- 67% seek out science content
- 65% believe they can tell real news from fake news

MEDIA/SOCIAL

- 71% reads the news (print or online) only once or twice a week or less often

DEMOGRAPHICS

- More likely to be South Asian
- More likely to be a university graduate

FOLLOWS SCIENCE

Intimidated by science, but trust what scientists and news media say about it

- 76% COVID-19 vaccines approved for use in Canada are safe
- 81% science can be relied upon because it is based on facts and not opinion
- 84% are not good at math
- More likely than others to rely on news media for science information (42%)
- Most likely to disagree they can identify valid science from pseudoscience

"I believe that if science wants to be seen more and appreciated more by youth it needs to be represented more on social media."

FOLLOWS SCIENCE

20%

KEY DIFFERENTIATORS

- Opinions generally align with science
- More likely to read articles and coverage in the news media
- Least likely to discuss social or world issues with family or friends
- Most likely to admit they may not be able to tell valid science from pseudoscience
- Are not good at math

OPINIONS

- 77% I got a COVID-19 vaccine (or plan to) mainly due to advice from public health officials
- 65% In the coming decade, good-paying jobs will increasingly require an understanding of STEM

SKILLS

- More arts-inclined, and unlikely to pursue a career in STEM
- More likely to say science is too intellectually demanding

INTERACTIONS W/SCIENCE

- Average % seeking out science content
- Average % personally researching issues

MEDIA/SOCIAL

- More likely to rely on articles and coverage in the news media to learn about an issue
- Above average social media user, but least likely to discuss social and world issues with peers
- More likely to use TikTok

DEMOGRAPHICS

- Average education, but parents more likely to have above average education

QUESTIONS SCIENCE

Questions science, independent thinker who looks at all sides of an issue

- 58% science can be relied upon because it is based on facts and not opinion
- 88% just because something is scientifically proven doesn't make it true
- 60% I don`t believe the side effects of the COVID-19 vaccine are well-understood yet
- 82% I generally listen to my intuition or what feels right to me on important decisions related to my health

« ***Il n'y a pas que la science dans la vie on nous apprend en philosophie que les 2 sont importants, mais pour moi la philosophie de chacun est plus important. Tout dépend du point de vue. Chacun fait son propre choix et cela fait partie de nos droits et c'est très important pour moi. »***

QUESTIONS SCIENCE

16%

KEY DIFFERENTIATORS

- Only 6 in 10 agree COVID-19 vaccines approved for use in Canada are safe
- Believe scientific proof doesn't equal truth
- Uses intuition to make personal decisions
- Don't feel pressure to express the same opinions as family or friends
- Confident they can tell real news from fake news

OPINIONS

- Careers in science are interested and exciting
- 1 in 3 there is no strong scientific evidence that climate change is the result of human behaviours and activities.

SKILLS/ RELIGION

- 80% strong sense of curiosity
- 72% adopt new technology easily
- 1 in 4 attend religious services regularly
- 65% can identify valid science from pseudoscience

INTERACTIONS W/SCIENCE

- More likely to discuss COVID-19 vaccines with family and friends

MEDIA/SOCIAL

- Above average uses of social media
- More likely to use snapchat
- Below average percentage read the news

DEMOGRAPHICS

- More likely to live in Quebec
- More likely to identify as Christian
- More likely to have graduate degree
- Parents also more likely to have graduate degree

MAY IGNORE SCIENCE

May not even listen to the science, follows those who have influence in their life

- 52% COVID-19 vaccines approved for use in Canada are safe
- 43% curbing the use of fossil fuels will not help reduce the impacts of climate change
- 72% feel pressure to express the same opinions as my family or friends even if I don`t agree with them
- 71% just because something is scientifically proven doesn't make it true

"I understand science, but I often do not agree with how much of the truth gets shared to the public and how much gets twisted. I also have my religious views which sometimes go against what "science" says."

MAY IGNORE SCIENCE

25%

KEY DIFFERENTIATORS

- Least likely to support science-led views
- Most likely to feel pressure to hold same opinions as family and friends
- Least able to determine real news from fake news
- Most likely to follow someone on social media who has anti-science views

OPINIONS

- Most anti-science across a variety of issues of all segments.
- Only 53% agree all/most of the people I am close to got the COVID-19 vaccine as quickly as they could.
- Only 51% my family/friends have discussed how the climate has changed over the years (lowest of all segments)

SKILLS/ RELIGION

- Most likely to attend religious services regularly (43%)
- Least curious
- Hardest time adopting new technology

INTERACTIONS W/SCIENCE

- High level of concern about security and privacy online.
- Less comfortable sharing personal information online

MEDIA/SOCIAL

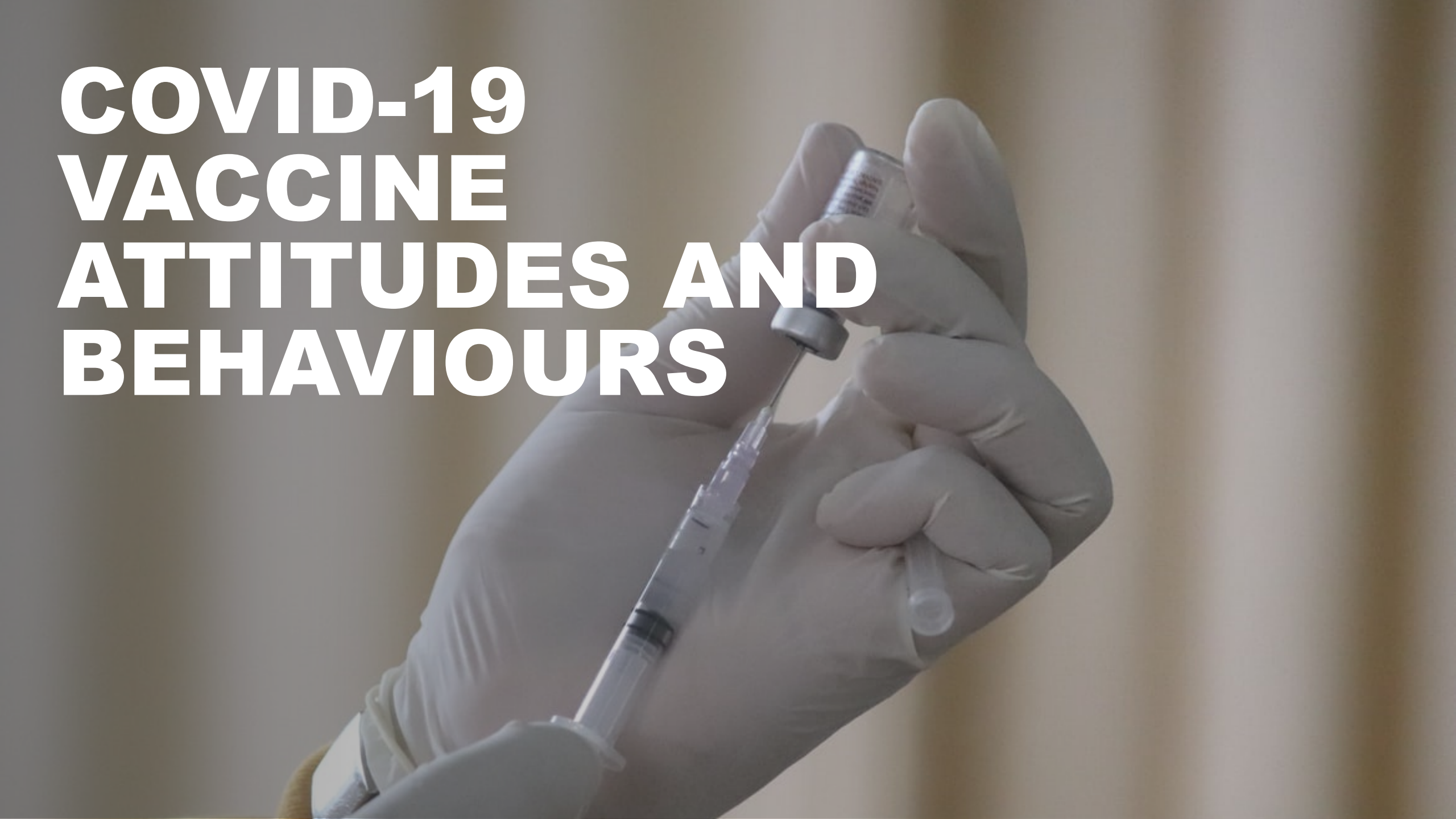
- Above average posting on social media about social and world issues
- Least likely to read the news
- More likely to watch cable TV

DEMOGRAPHICS

- 47% identify as a person of colour
- Leans male
- Least educated parents
- More likely to have completed technical or college education

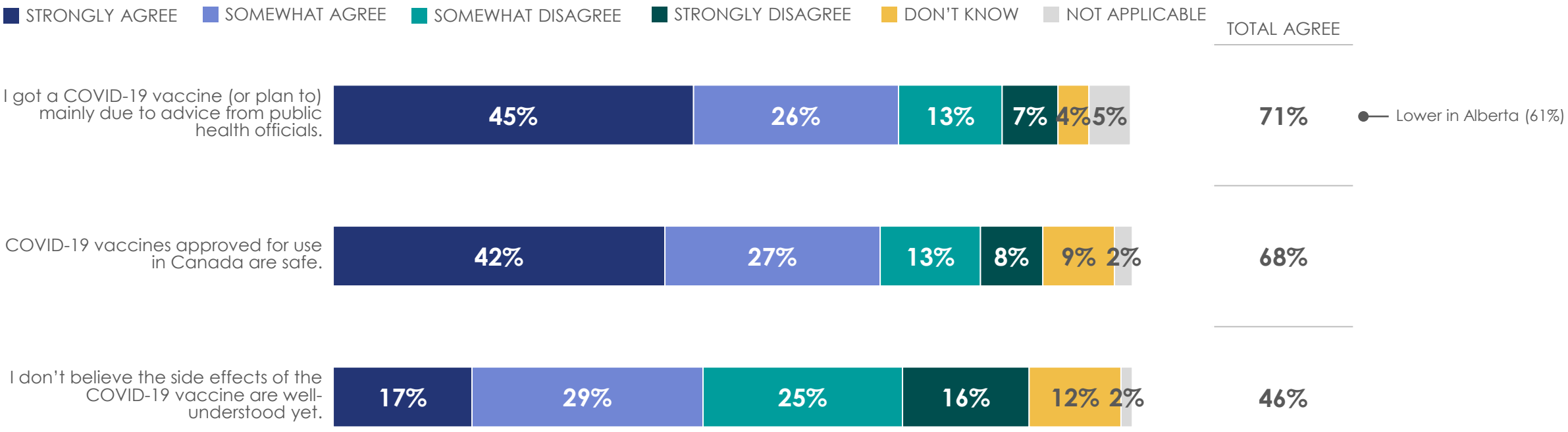
DETAILED FINDINGS

COVID-19 VACCINE ATTITUDES AND BEHAVIOURS



A majority of Canadian youth believe COVID-19 vaccines approved for use in Canada are safe.

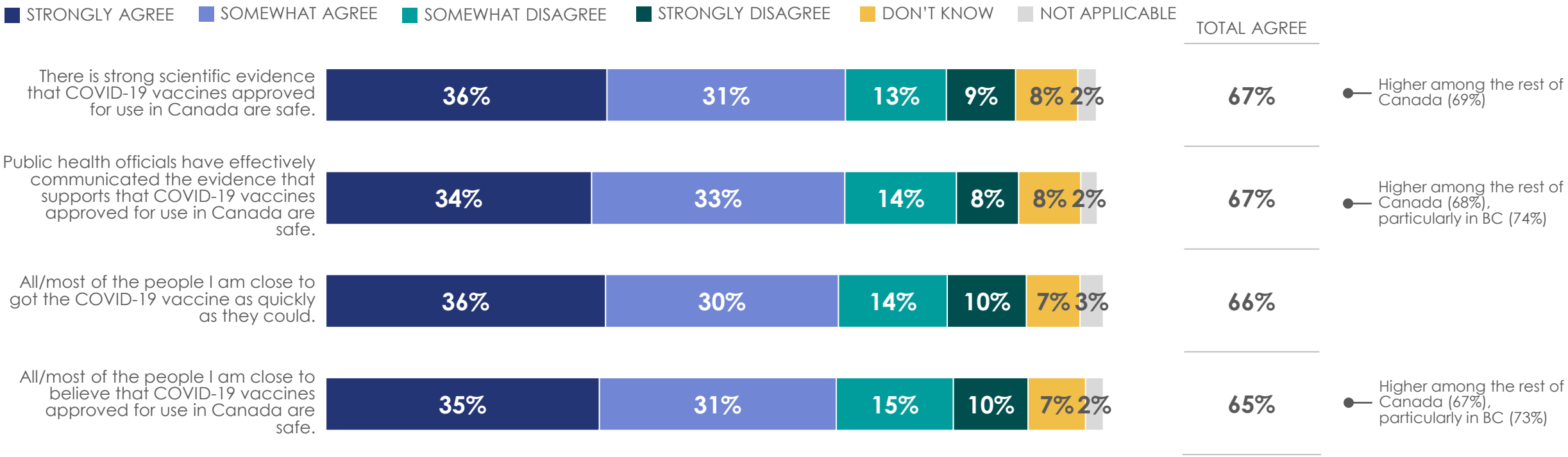
- Just over seven in ten (71%) Canadians aged 18-24 years say that they either received or plan to receive their COVID-19 vaccine mainly due to advice from public health officials. While many got the vaccine on the advice of public health officials, that is not to say that they did not also support the science that says the current COVID-19 vaccines used in Canada are safe.
- In fact, those who disagree with this statement may in fact have gotten the vaccine after their own consideration, not just acting upon advice from public health authorities (e.g. doing their own research or discussions with family and friends).
- However, the fact remains that 30% disagree or don't know if the COVID-19 vaccines approved for use in Canada are safe, many of whom (46%) say that the side effects of the COVID-19 vaccines are not well-understood.



Q1. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

Canadian youth are also exposed to consolidated sources of influence regarding COVID-19 vaccine.

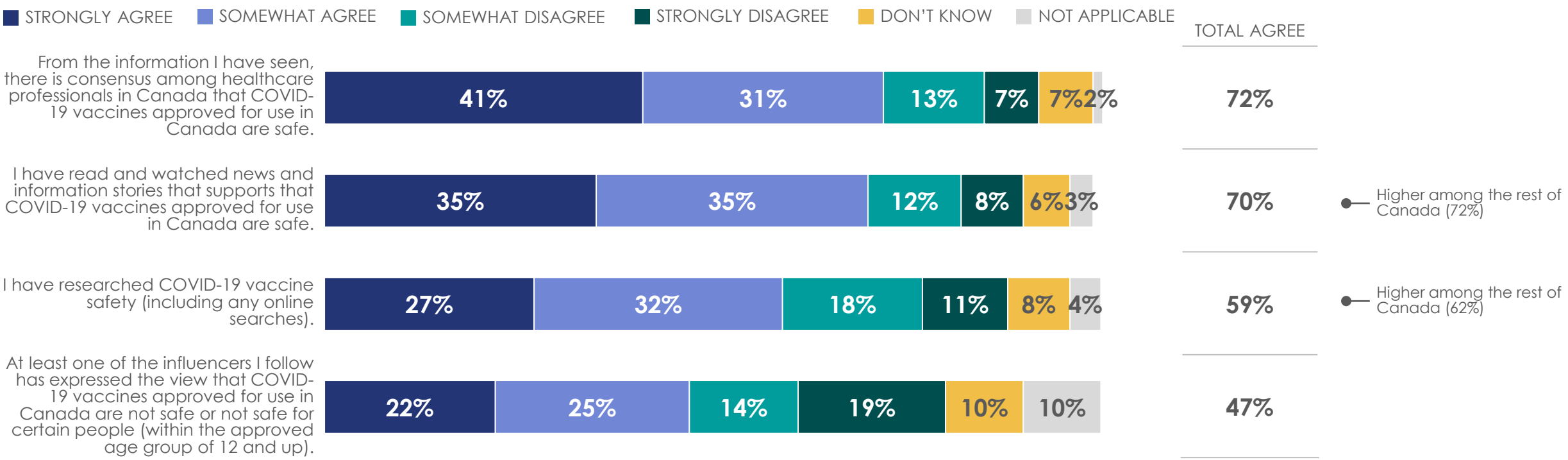
- Sources of influence appear to be consolidated when it comes to attitudes towards the COVID-19 vaccine. Roughly two-thirds of Canadian youth say that scientific evidence, public health officials, and their peer group have expressed some kind of pro-vaccine attitude or behaviour.



Q2. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

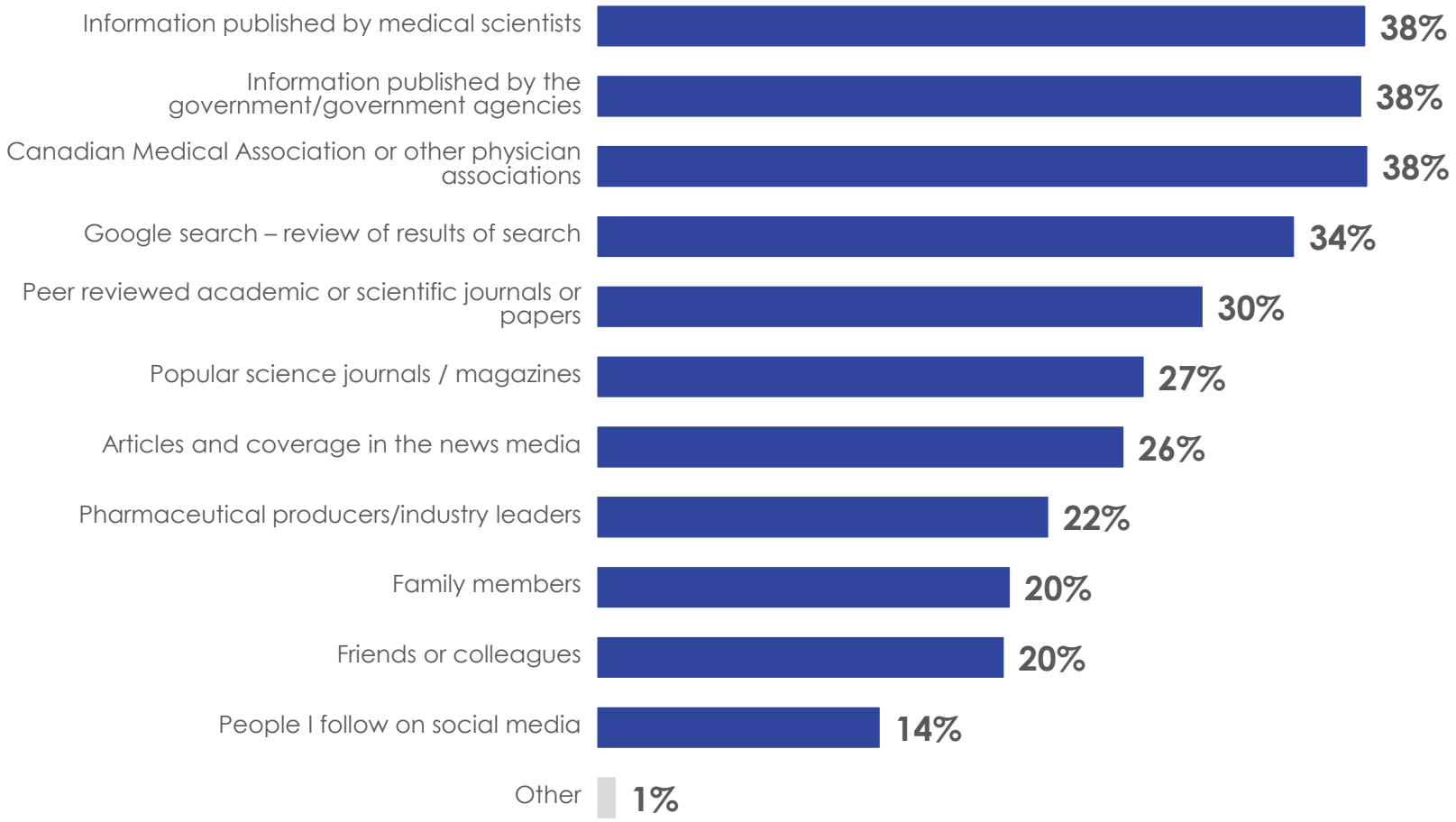
Majority of Canadian youth say they have done own research into COVID-19 safety.

- Messaging surrounding the COVID-19 vaccine appears to have penetrated into this age group, as seven in ten say there is a consensus among healthcare professionals that the COVID-19 vaccines used in Canada are safe and that they have seen information supporting this point of view.
- That said, Canadian youth are also engaged in seeking out information about the COVID-19 vaccine, six in ten (59%) say that they have researched the safety of the COVID-19 vaccine. Whether this research pushed them towards receiving the vaccine or away from it is not yet clear.
- However, nearly half (47%) say that at least one of the influencers they follow has expressed the view that the COVID-19 vaccines are approved for use in Canada are not safe, further highlighting the potential that social media has for both information and misinformation.



Q2. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

Sources such as medical scientists, government agencies, and the CMA are important sources of information about COVID-19 vaccines.



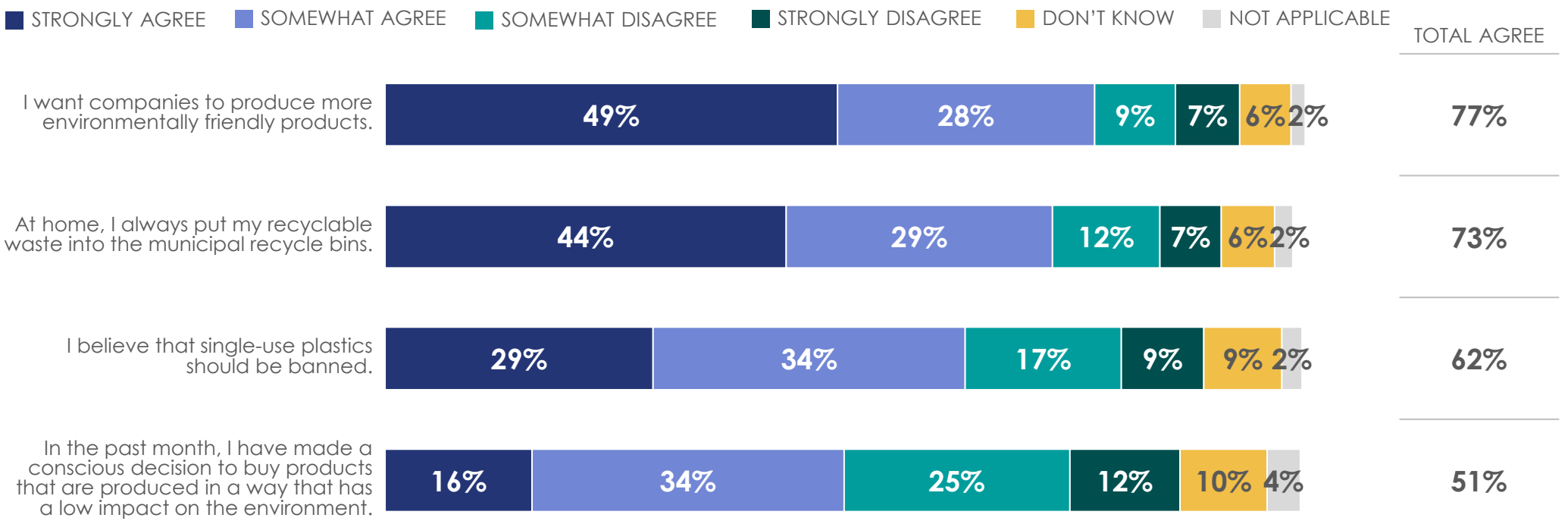
- When it comes to finding out information about COVID-19 vaccines, Canadian youth say they would be most likely to consult information by published medical scientists, the government, and the Canadian Medical Association (CMA).
- A third (34%) say they'd make use of a Google search. Though search engines are a ubiquitous tool that is hard to avoid nowadays, they can also potentially point people in the direction of misinformation.
- In the aggregate, family, friends/colleagues, and social media personalities are sources that are less often trusts. However, for some, they may be the most influential sources.

Q5. If you wanted to learn more about the following topics, where would you go for information on these topics?
Base: All respondents (n=1500)

SUSTAINABILITY/ RECYLCING ATTITUDES AND BEHAVIOURS

High attention to the environment, though action is lags slightly.

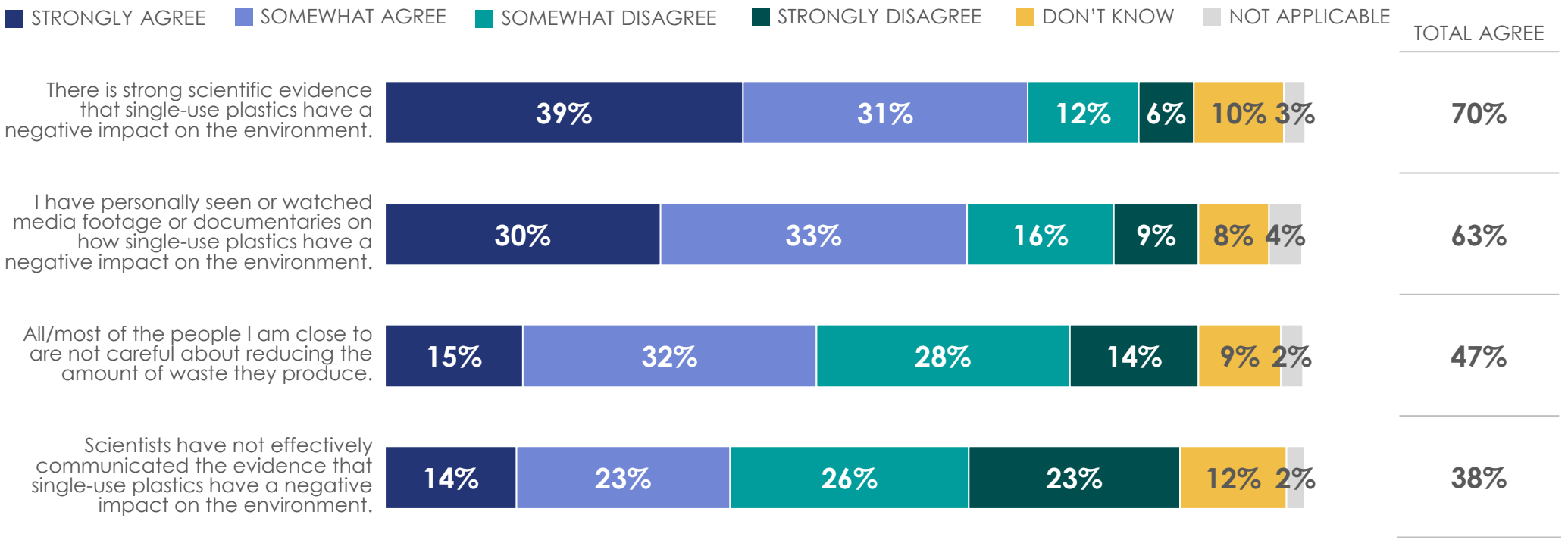
- Canadian youth are also very much tuned into the issue of sustainability/recycling. However, there is some evidence of a say-do gap when it comes to the environment. While over three-quarters (77%) say they want companies to product more environmentally friendly products, half (51%) say that they've made a conscious decision to buy these same products in the last month.
- This may be more a question of being able to afford these products (which very often come with a higher price tag), as three-quarters (73%) agree that they always put their recyclable waste into the appropriate bin – an environmentally-conscious action that doesn't cost anything.
- Fewer a quarter express attitudes going against the spirit of sustainability – that companies should not produce more environmentally friendly products (16%), that they do not put their recyclable waste into the right bin (19%), or that single-use plastics should not be banned (26%).



Q1. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1500)

Aware of problem of single-use plastics, but lacking in those who lead by example.

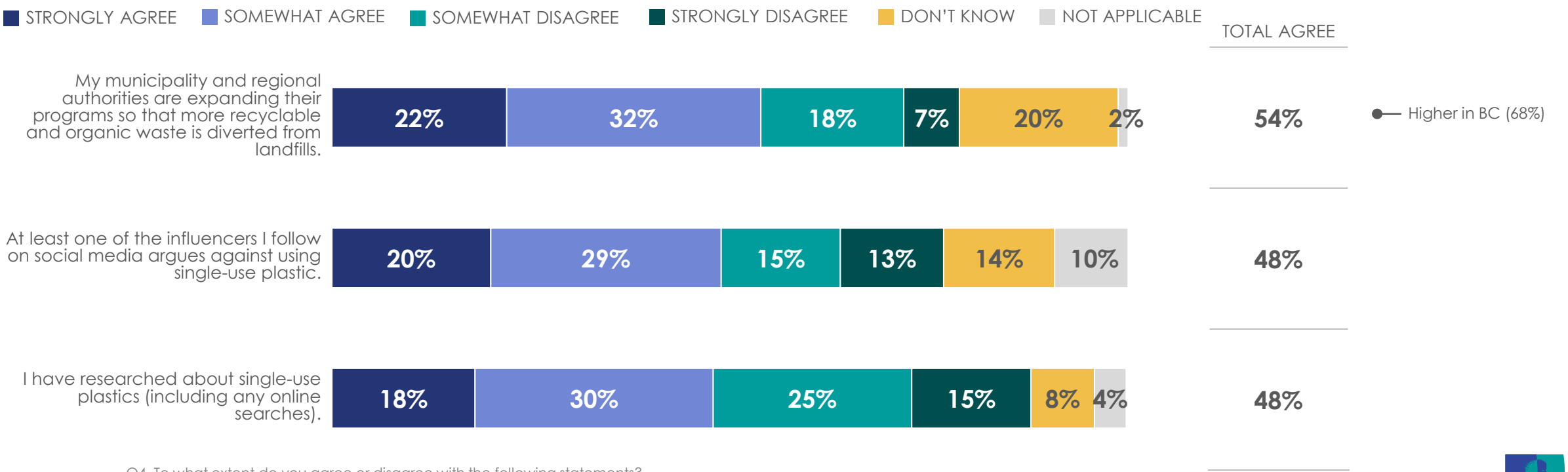
- Canadian youth are very much aware of the problem of single-use plastics. Seven in ten (70%) agree there is strong evidence that they are harmful to the environment and six in ten (63%) say they have seen media footage or documentaries highlighting this.
- Half (49%) say that scientists have effectively communicated the harm that single-use plastics do to the environment (while four in ten say they have not), perhaps a reflection of the four in ten (47%) who say all/most of the people they are closed to are careful about reducing the amount of waste they produce.



Q4. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1500)

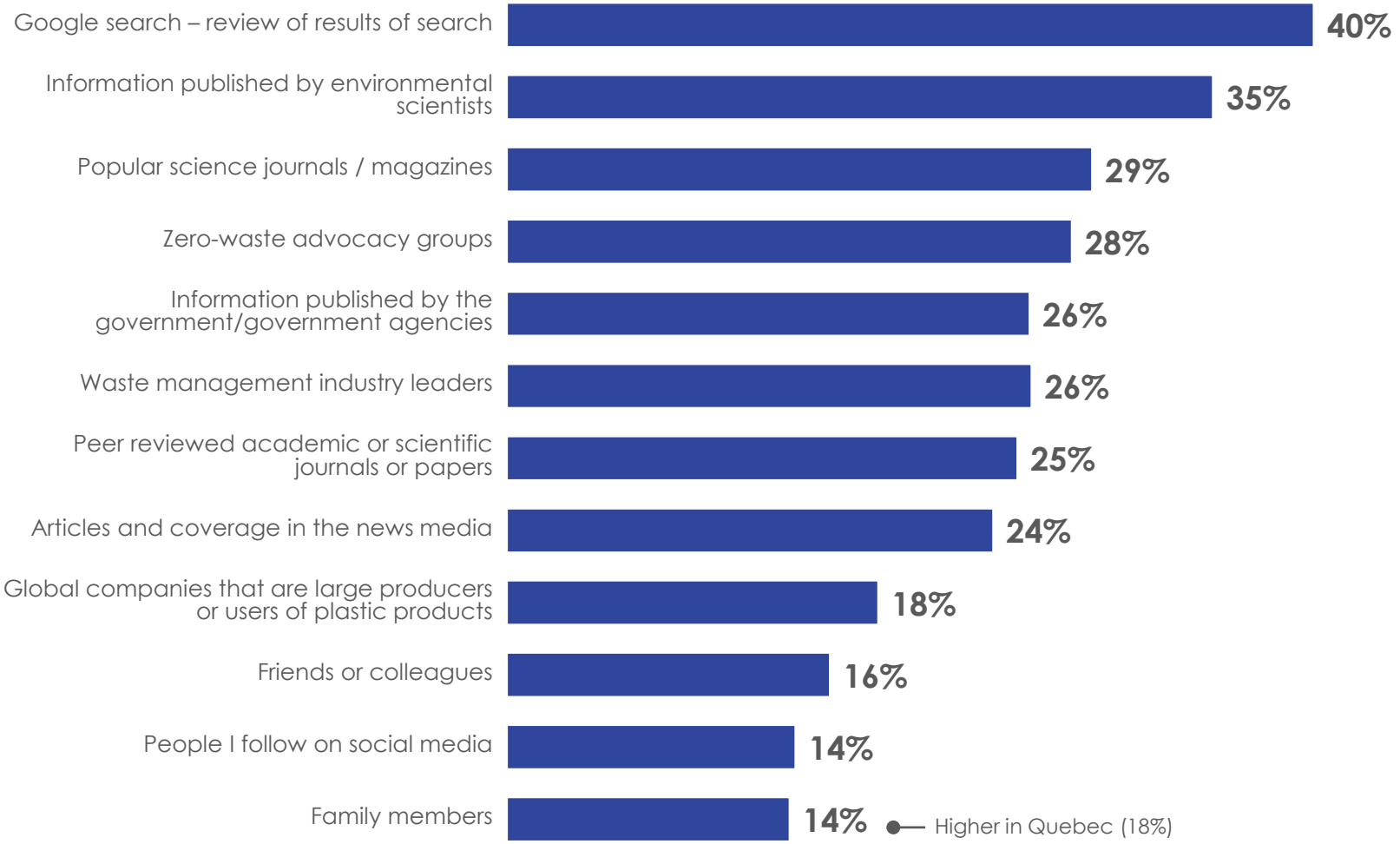
Half say influencers they follow argue against using single-use plastics.

- Over half (54%) say that their municipal/regional authorities are expanding their programs so that more recyclable/organic waste is diverted from landfills. Given the complexity of this question, these responses may reflect some degree of wishful thinking on the part of respondents. Two in ten (20%) say that they don't know, also an understandable response from this age group when it comes to municipal waste management plans.
- Pointing to the power of social media to inform (rather than misinform), nearly half (48%) say that at least one of the influencers they follow on social media argues against using single-use plastics.
- Six in ten Canadian youth have done their own research when it comes to COVID-19 vaccines, but the proportion of those who have researched single-use plastics is significantly lower – 48%.



Q4. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1500)

Google is the most popular source of information on single-use plastics, with environmental scientists coming in second.



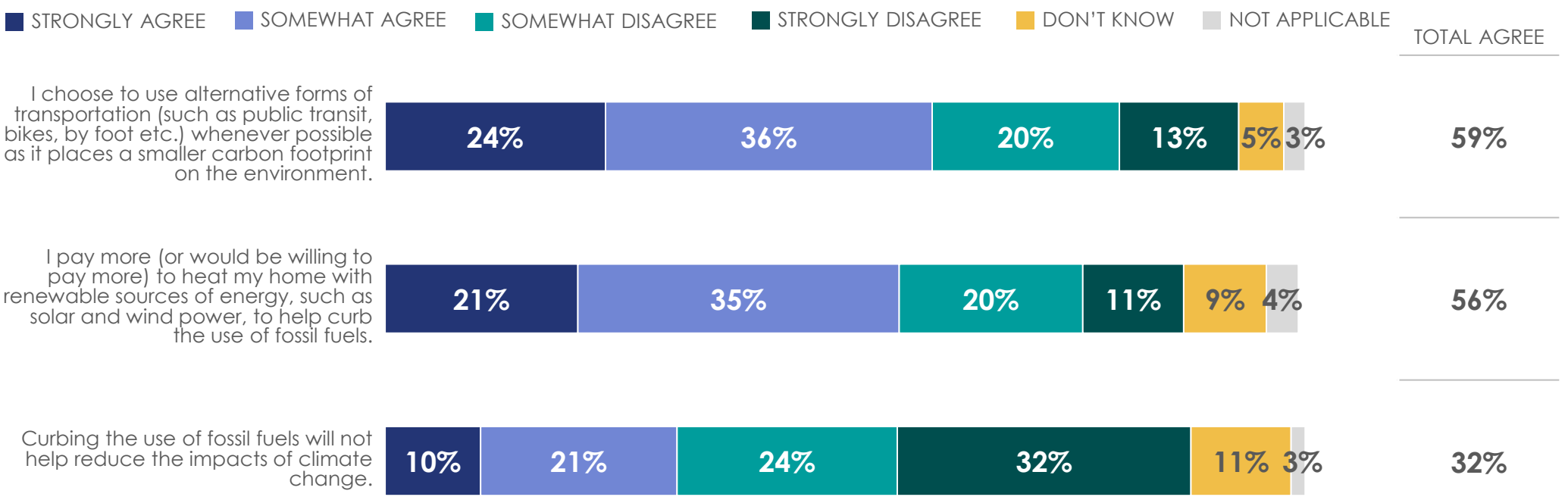
- When it comes to learning more about single-use plastics, Canadian youth would be most likely to turn to a Google search, followed by information published by environmental scientists
- Popular science journals and magazines, advocacy groups, the government, the waste management industry, and the news media are all consulted to similar proportions.
- Once again, friends/colleagues, social media influencers, and family are less often consulted.

Q5. If you wanted to learn more about the following topics, where would you go for information on these topics?
Base: All respondents (n=1500)

CLIMATE CHANGE ATTITUDES AND BEHAVIOURS

Majority have engaged in behaviours such as using public transport, though a large proportion skeptical over utility of curbing fossil fuels.

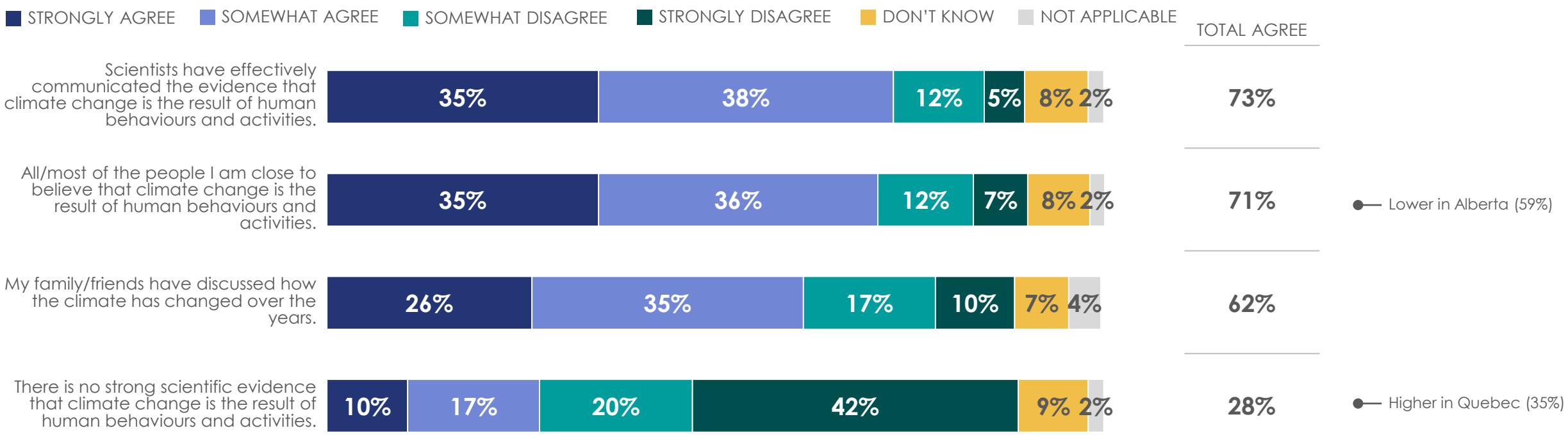
- Six in ten (59%) agree that they choose to use alternative forms of transportation wherever possible. Those 33% who disagree to some extent may do so out of necessity, as they may live in areas with limited access to public transport. It may also be the case that their decision to use alternative forms of transport may be independent of environmental concerns.
- A similar proportion say they'd be willing to pay more to heat their home with renewable sources of energy, as it would help curb the use of fossil fuels.
- One-third (32%) agree that curbing the use of fossil fuels will not help reduce the impacts of climate change, with another 11% saying they don't know. However, over half (56%) still believe that becoming less reliant on fossil fuels will help the environment in some way.



Q1. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

Agreement on messaging, though some not entirely convinced on climate change.

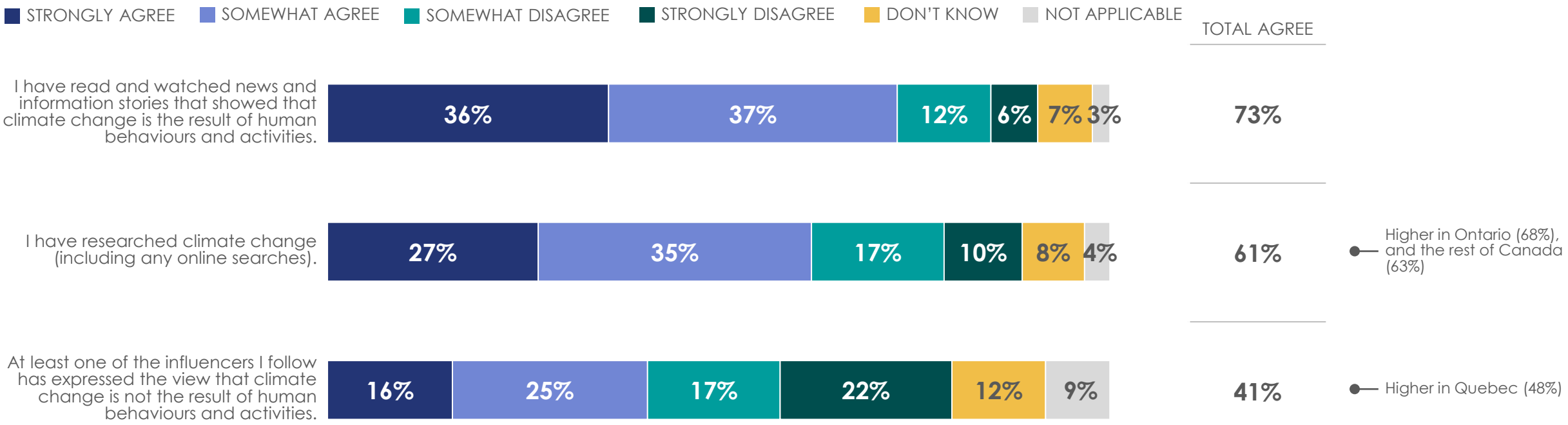
- Canadian youth acknowledge that scientists have effectively communicated the evidence that climate change is the result of human activity, with nearly three-quarters (73%) agreeing with this statement. In fact, only 17% say they disagree to some extent.
- In addition, their peers are mostly agreed on climate change – seven in ten (71%) say all/most of those around them believe climate change is caused by humans and six in ten (62%) say they've talked about how the climate has changed over the years with family/friends.
- Yet, three in ten (28%) agree that there is no strong scientific evidence that climate change is the result of human behaviours and activities, though another 9% say they don't know. A further two in ten (20%) also 'somewhat disagree' meaning that while they may disagree with such a strong statement, they may hold some views that could be seen as going against the wider scientific consensus about climate change.



Q3. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

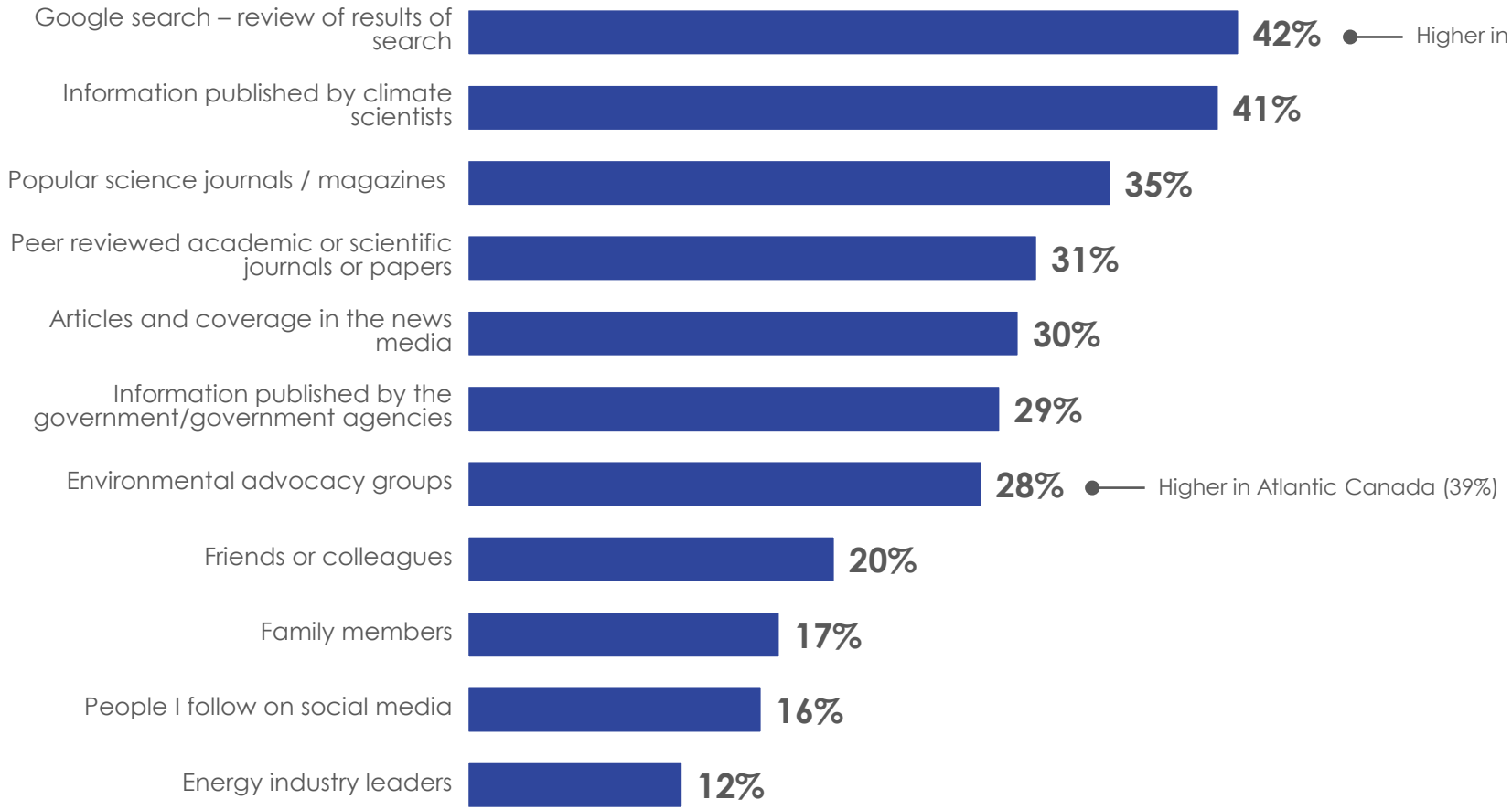
In spite of widespread consensus, influencers still express climate skeptic views.

- Nearly three-quarters (73%) say that they have read and watched news/information stories that showed climate change being the result of human behaviours and activities.
- A similar proportion to those who say that they have researched information about COVID-19 vaccines, six in ten (61%) say that they have researched climate change on their own.
- Somewhat worrying is that four in ten (41%) say that at least one of the influencers they follow has expressed the view that climate change is not the result of human behaviours and activities.



Q3. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

Google is the most popular source of information on climate change, though climate scientists are a more frequent source than environmental scientists are for single-use plastics.



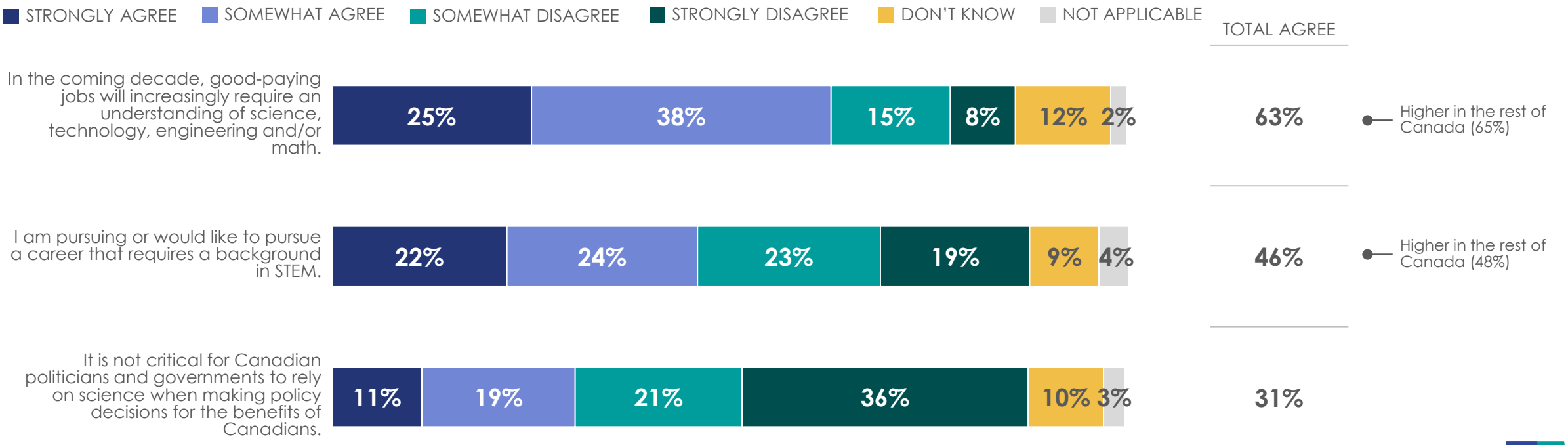
- When asked where they would go to learn more about climate change, Google is understandably one of the most often consulted sources (tied with climate scientists).
- Environmental advocacy groups are surprisingly not consulted as often as other sources.
- Least often consulted are friends/colleagues, family members, social media sources, and the energy industry.

Q5. If you wanted to learn more about the following topics, where would you go for information on these topics?
Base: All respondents (n=1500)

ATTITUDES AND BEHAVIOURS TOWARDS STEM

Many Canadians youth acknowledge the value of STEM, even if it may not be their intended career path.

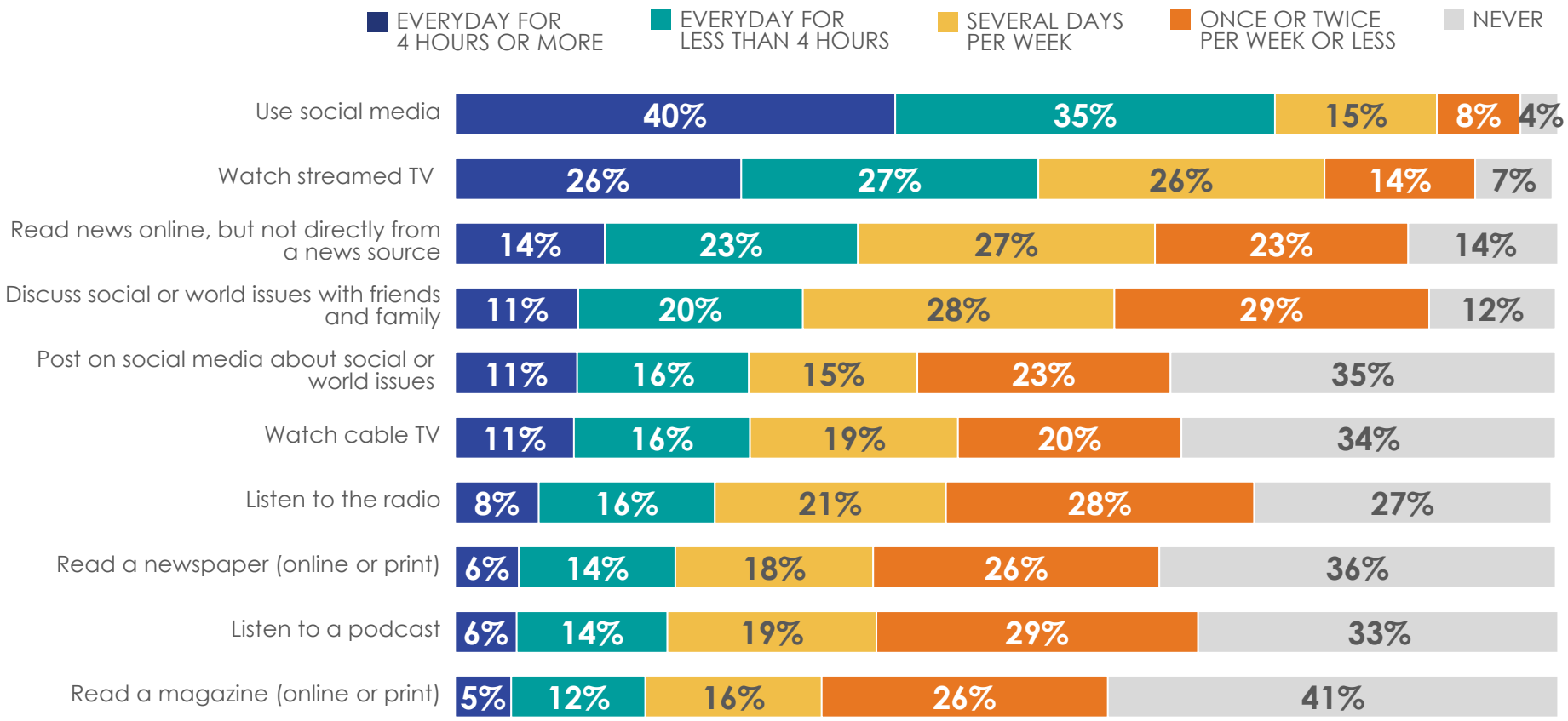
- Nearly half (46%) say that they are either pursuing or would like to pursue a career in a STEM-related field, with another 9% saying they don't know yet. Even if some Canadian youth are not intending to pursue a career in STEM, they acknowledge that in the future, good-paying jobs will increasingly require an understanding of STEM subjects (63%).
- However, three in ten (31%) agree to some degree that it is not critical that Canadian politicians/governments to rely on science when making policy decisions. Another 10% say they don't know.



Q1. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1261)

GENERAL MEDIA CONSUMPTION HABITS

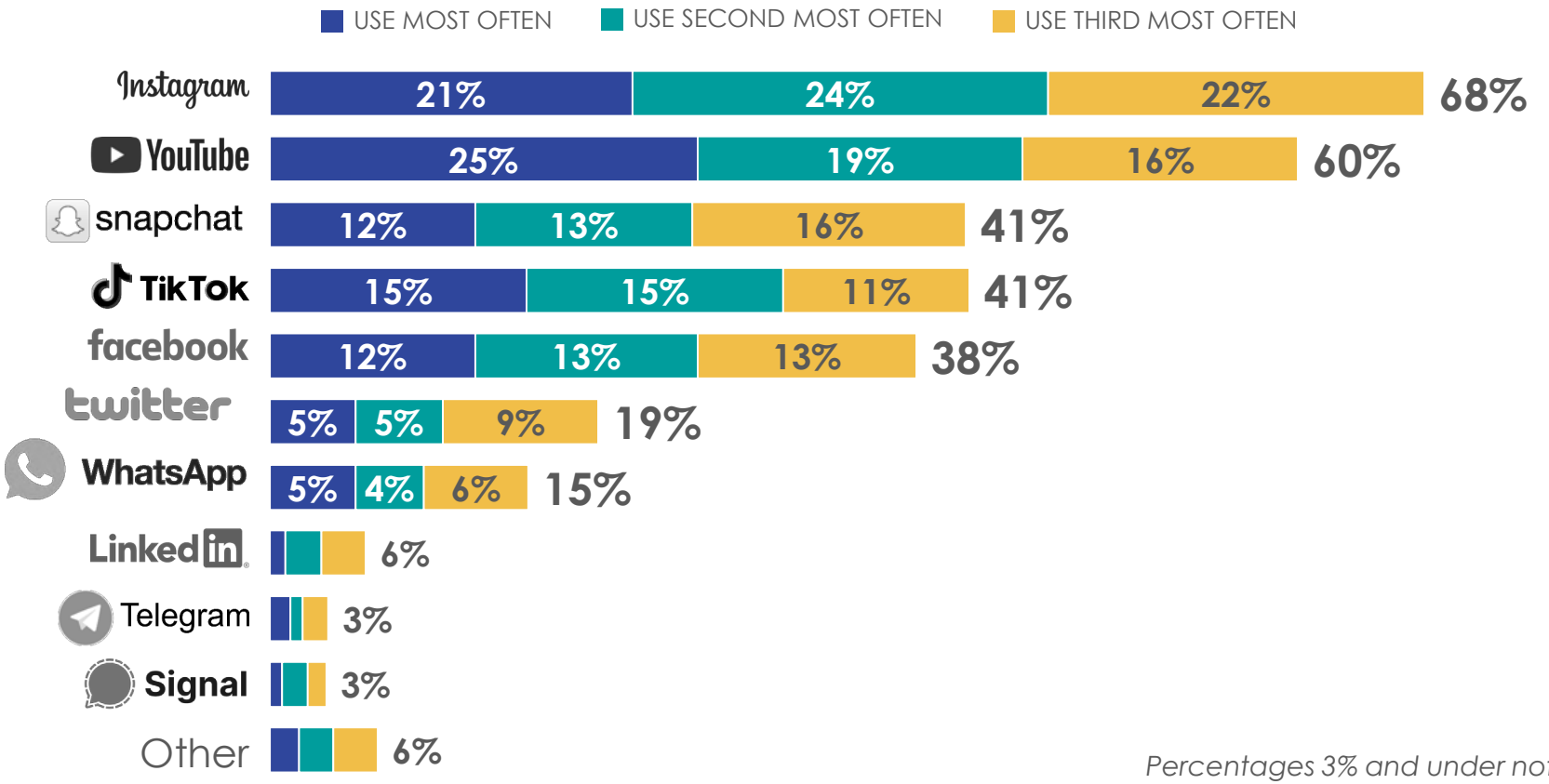
Social media rules the day; nearly all Canadian youth are using it at least every day.



- Three-quarters say they use social media everyday (with 9 in 10 saying they use it at least several days a week).
- Streaming TV is the next most popular form of entertainment, with nearly 8 in 10 saying they watch streaming TV at least a few days a week.
- In line with other research, Canadian youth are less likely to read a newspaper or magazine.
- Contrary to popular belief, Canadian youth are not completely disengaged from the news – roughly three in ten say they read the news online or discuss social/world issues with their friends and family.
- Approximately a quarter say they are engaged to the point where they post on social media about social/world issues.

Q6. In an average week, how often do you ...?
Base: All respondents (n=1500)

Canadian youth favour Instagram and YouTube, eschew Facebook.



- Instagram and YouTube are the most often used social media accounts among Canadian youth, followed by Snapchat, TikTok, and Facebook.
- Those in Atlantic Canada are more likely to say they use Facebook the most often (24%).
- Snapchat is also a favourite among those in Atlantic Canada, with 24% saying they use it the most often.

Percentages 3% and under not labelled

Q7. Which of the following social media accounts do you use most often? Rank your top 3 most often used accounts.
Base: Social media users (n=1127)

As expected, favourite influencers vary greatly within this age group.

- While the top mentions may seem small, they are not insignificant within a sample of this size.

TOP HEALTH/FITNESS SOURCES

Dwayne Johnson: 4%
@therock

Chloe Ting: 3%
@chloe_t

TOP FASHION, FOOD OR LIFESTYLE SOURCES

Gordon Ramsay: 3%
@gordongram

Buzzfeed Tasty: 1%
@buzzfeedtasty

Emma Chamberlain: 1%
@emmachamberlain

Q8. Whom do you follow most often on social media when it comes to …?
Base: Social media users (n=298) (n=352)

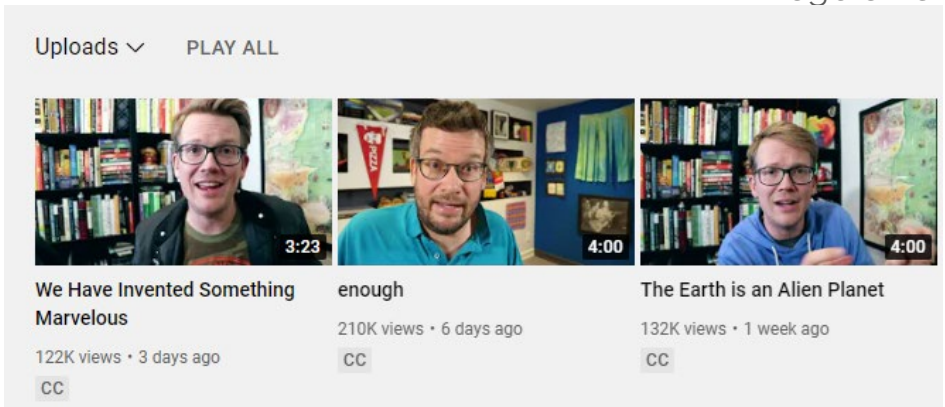
As expected, favourite influencers vary greatly within this age group.

- Science and technology influencers also vary, but there are recurring favourites.

TOP SCIENCE AND TECHNOLOGY SOURCES

Nasa: 6%
@nasa

Hank Green: 3%
Vlogbrothers



Bill Nye: 3%
@BillNye

Elon Musk: 2%
@elonmusk

Q8. Whom do you follow most often on social media when it comes to ...?
Base: Social media users (n=292) (n=285)

As expected, favourite influencers vary greatly within this age group.

- Full verbatim statements are also available to delve into the variety of mentions.

TOP POLITICS/CURRENT AFFAIRS SOURCES

Justin Trudeau: 4%
@JustinTrudeau

CBC: 2%
@CBCNews

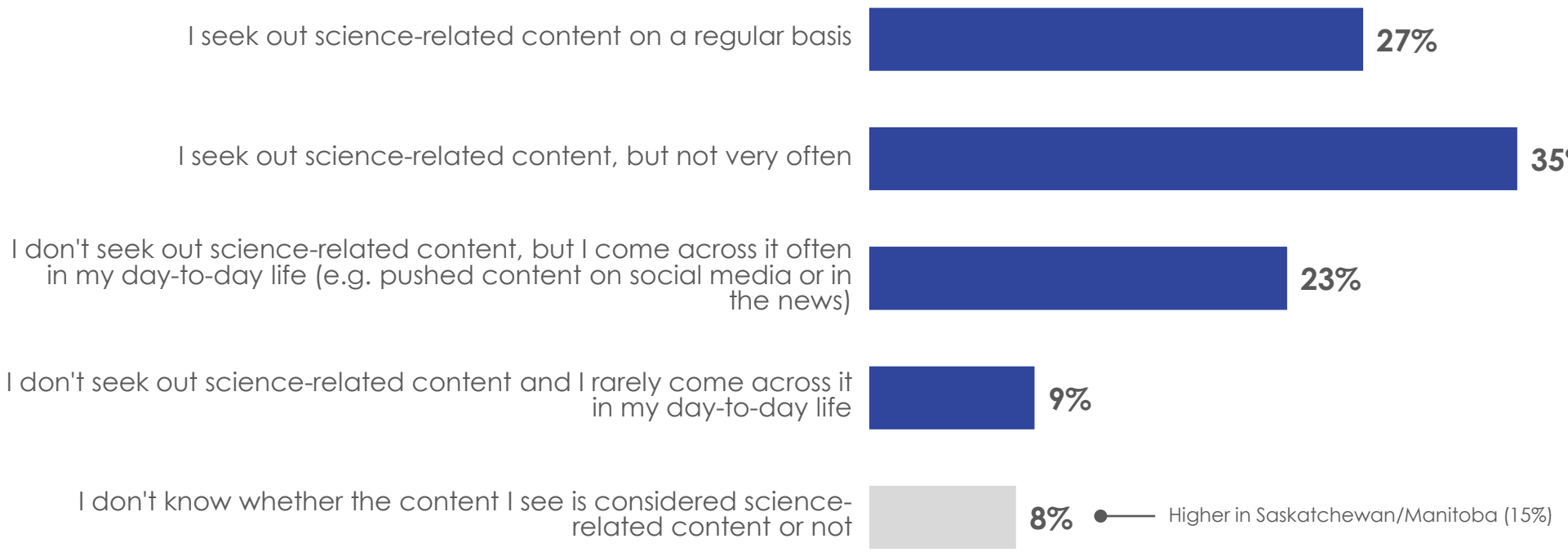
Donald Trump: 2%

Alexandria Ocasio-Cortez: 2%
@AOC

Q8. Whom do you follow most often on social media when it comes to …?
Base: Social media users (n=292) (n=285)

Canadian youth do seek out scientific content on a regular basis.

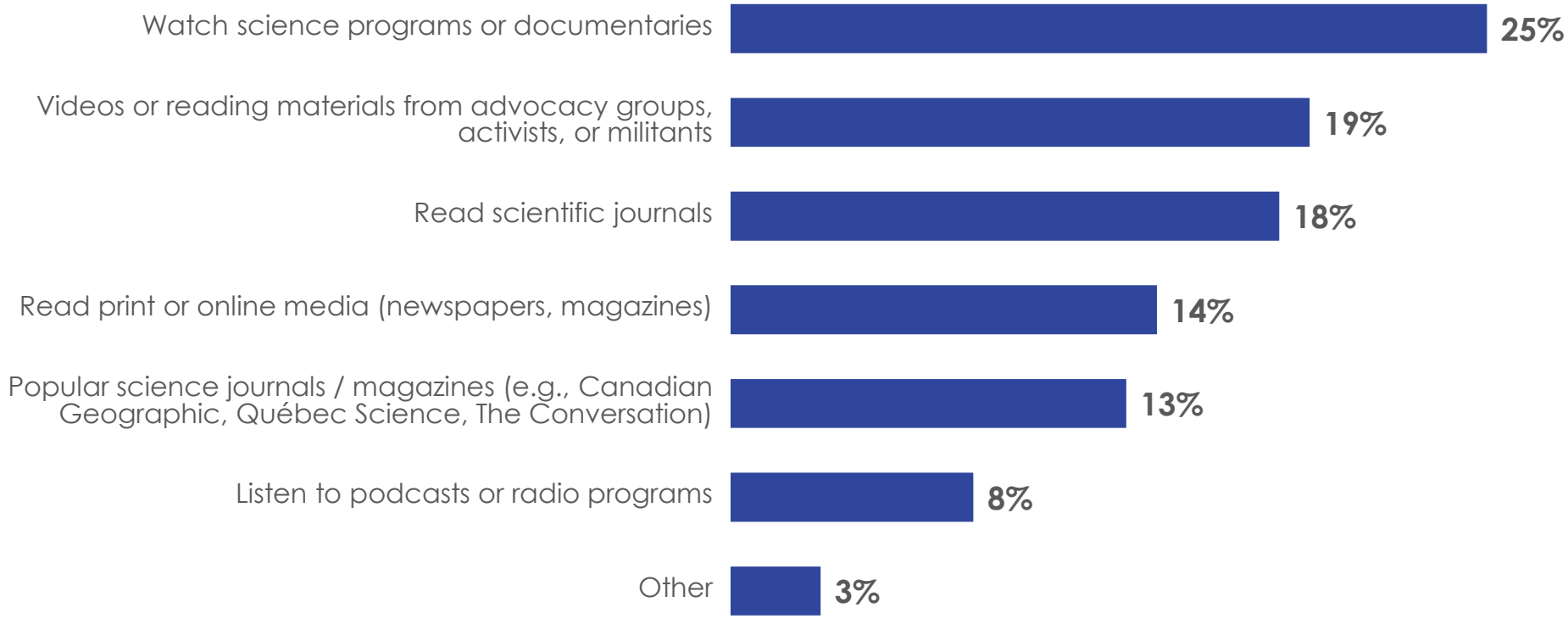
- Roughly a quarter (27%) say that they are engaged with science-related content such that they actively seek it out, with another third (35%) saying that they seek science-related content out, but not very often.
- Another third (32%) say that they don't seek out science-related content, comprised of those who come across it anyway (23%) and those who rarely do (9%).
- However, 8% are unsure whether the content they see is considered science-related or not, highlighting the need to further education initiatives about how science is related to everyday life.



Q9. We'd like to know more about how you interact with scientific content. Some people seek out science-related information regularly, others come across science occasionally, some people never see science-related content. Which of the following best describes you? By "science-related content" we're referring to information based on science – this could be facts related to sustainability or climate change, developments with COVID-19, or new scientific technologies being developed.
Base: All respondents (n=1500)

When they do, television programs and documentaries are most often consulted for science-related content.

- Among those who say they seek out science-related content on a regular basis, science programs and documentaries are the most often consulted sources (25%).
- Videos or reading materials for advocacy groups is also a popular source (19%), as are scientific journals (18%).



Q10. Where do you get your science-related content most often?
Base: Seek out science-related content on a regular basis (n=391)

As many (if not more) people are going to streaming services for science-related content as non-science content.

Source *(top mentions only)*	Total	Watch in general *(asked among those saying they do not actively look for science content)*	Watch for science content *(asked among those saying they actively look for science content)*
TV STREAMING SERVICES (NET)	**49%**	**30%**	**56%**
Netflix	31%	12%	38%
YouTube	11%	14%	10%
TV CHANNEL (NET)	**26%**	**37%**	**22%**
CBC News Network	5%	7%	4%
Discovery	3%	7%	1%
National Geographic	4%	11%	1%
Don't know	18%	21%	17%

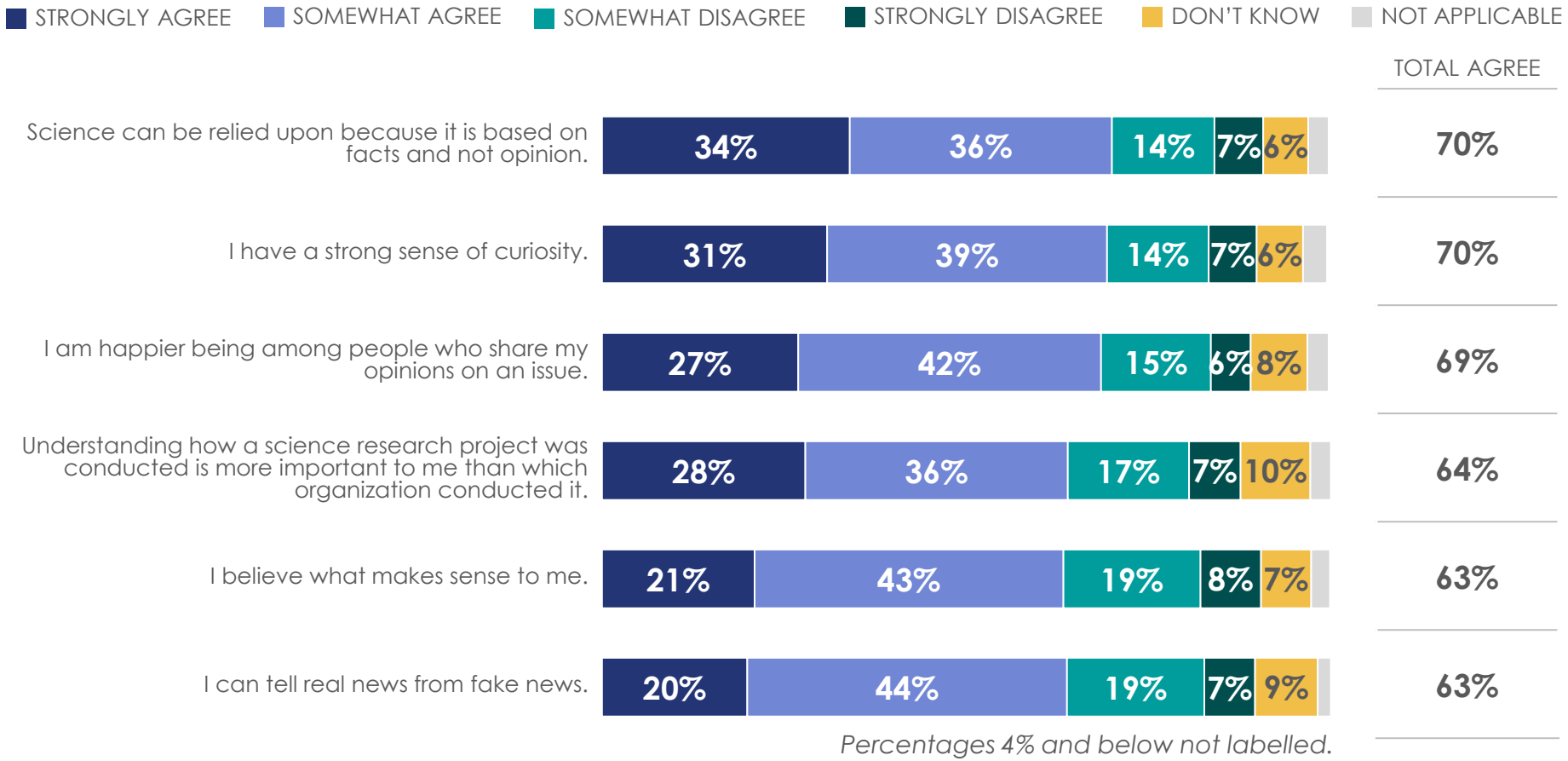
Q11. Which one television station, network or online streaming service do you watch most often [IF CODE 1 in Q9: for science content]?
Base: Watch TV Online/Cable (unweighted) (n=1199)
NB: Respondents who indicated at Q9 that they "seek out science-related content on a regular basis" were asked which tv station/streaming service they watch for science content. Respondents who do not seek out science-related content regularly were probed on their regular viewing habits (i.e., not specifically science related)

Canadian youth are more likely to turn to the radio for science-specific content, with no one particular radio source highlighted.

Source *(top mentions only)*	Total	Listen in general *(asked among those saying they do not actively look for science content)*	Listen for science content *(asked among those saying they actively look for science content)*
PODCASTS (NET)	**40%**	**40%**	**39%**
CBC	4%	5%	4%
Radio Canada	1%	2%	1%
Virgin Radio	3%	1%	3%
Joe Rogan/Joe Rogan Experience/JRE	3%	4%	2%
Spotify	3%	3%	4%
RADIO STATIONS (NET)	**27%**	**16%**	**32%**
Don't know	20%	26%	18%

Q12. Which one radio station or podcast do you listen to most often [IF CODE 1 in Q9: for science content]?
Base: Listen to Radio/Podcast (unweighted) (n=1070)
NB: Respondents who indicated at Q9 that they "seek out science-related content on a regular basis" were asked which radio station/podcast they listen to for science content. Respondents who do not seek out science-related content regularly were probed on their regular listening habits (i.e., not specifically science related)

Canadian youth have confidence in science, ability to tell real from fake news.

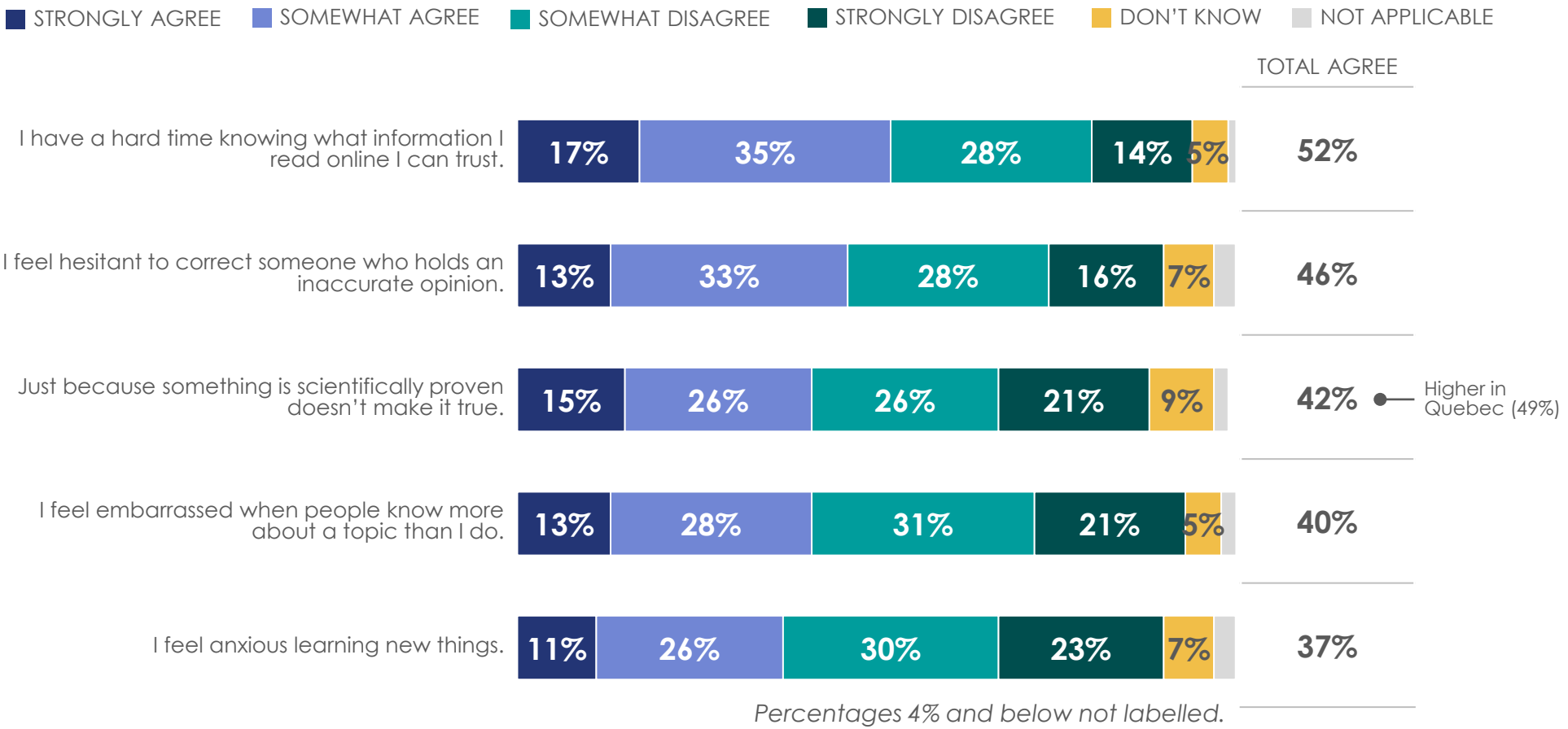


Percentages 4% and below not labelled.

- Canadian youth largely believe that science can be relied upon because it is based on facts and not opinion.
- Nearly seven in ten (68%) also say that they are happy being among people who share their opinion on an issue.
- About six in ten (62%) Canadian youth say that they are able to distinguish between real and fake news. However, whether they actually can is a separate matter.

Q14. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1500)

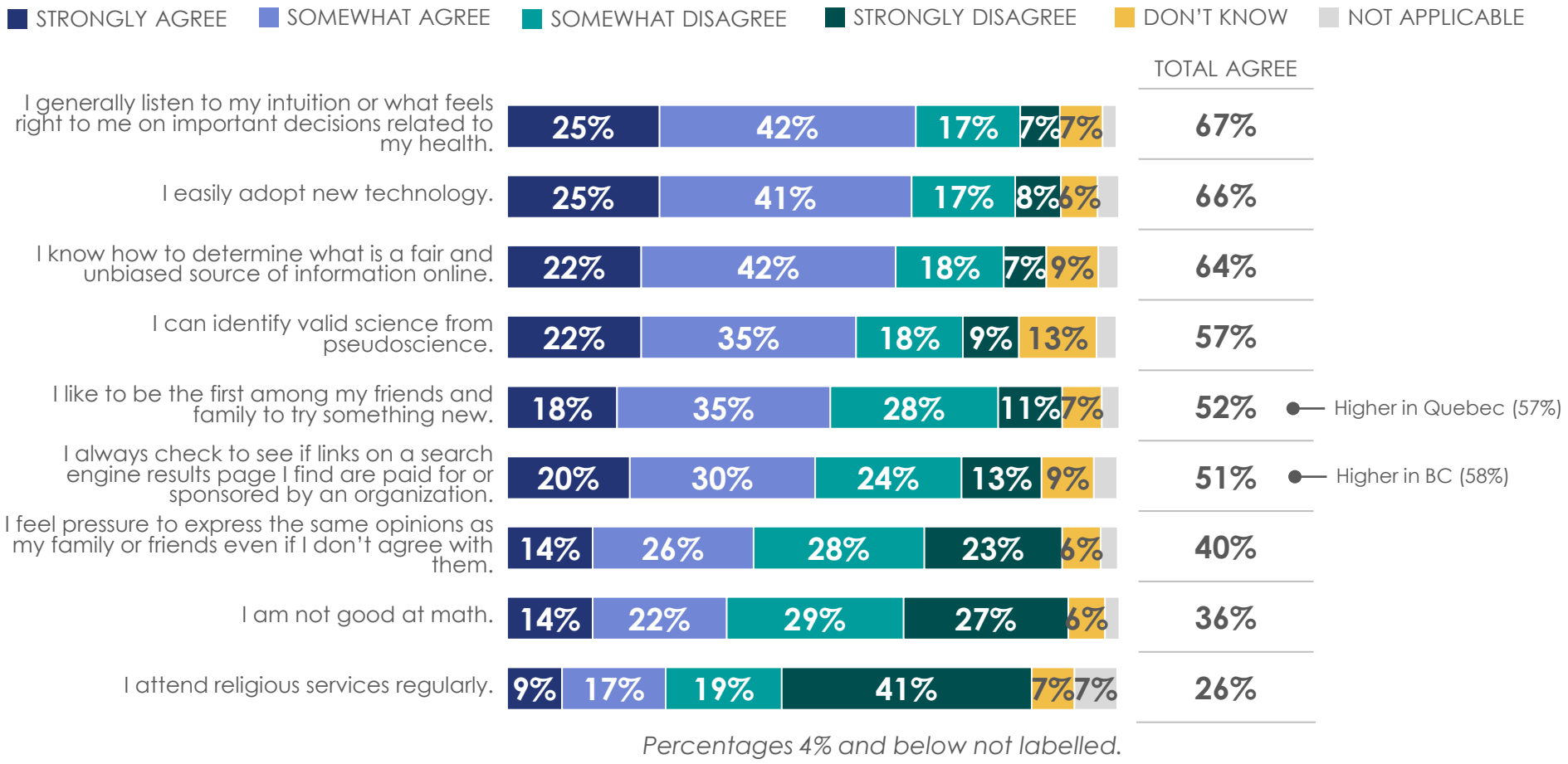
While youth are confident in their ability to sort real from fake news, when looking at online information more broadly half admit they struggle to know what sources are trustworthy.



- However, half (51%) say that they have a hard time knowing what information they read online to trust, most likely related to the influence of Google and social media when it comes to looking for information.
- Four in ten (40%) say that they feel embarrassed when people know more about a topic than they do and a similar proportion say they feel anxious learning new things.

Q14. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1500)

Most Canadian youth say they can tell valid science from pseudoscience; half say they check to see if the links on a search engine page have been paid for/sponsored.



Percentages 4% and below not labelled.

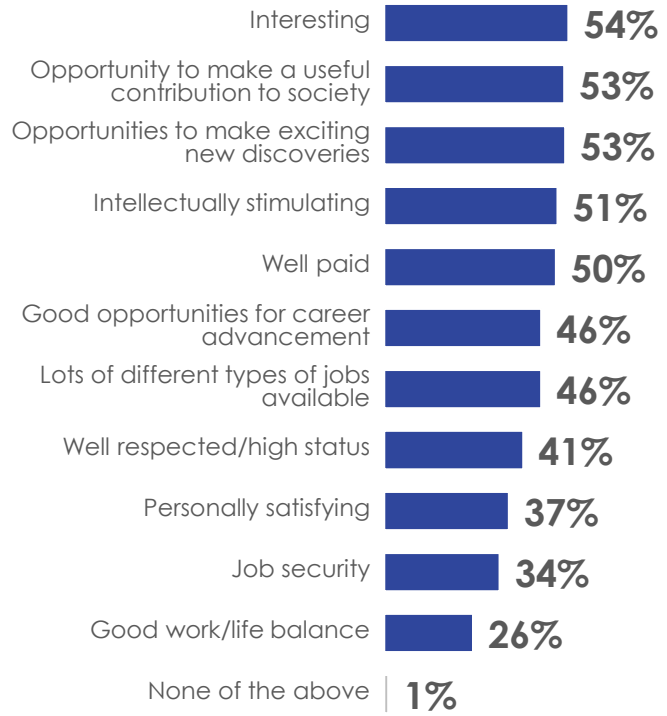
- Similar to how Canadian youth say they can tell real news from fake news, nearly six in ten (57%) say that they can tell valid science from pseudoscience. However, whether they can actually do so is another issue.
- Half (51%) of Canadian youth say they always check to see if links on a search engine results page are paid for/sponsored by an organization, a positive reflex given the large role that search engines play in the information discovery process.
- More concerning is the fact that over one-third (36%) say that they're not good at math.

Q15. To what extent do you agree or disagree with the following statements?
Base: All respondents (n=1500)

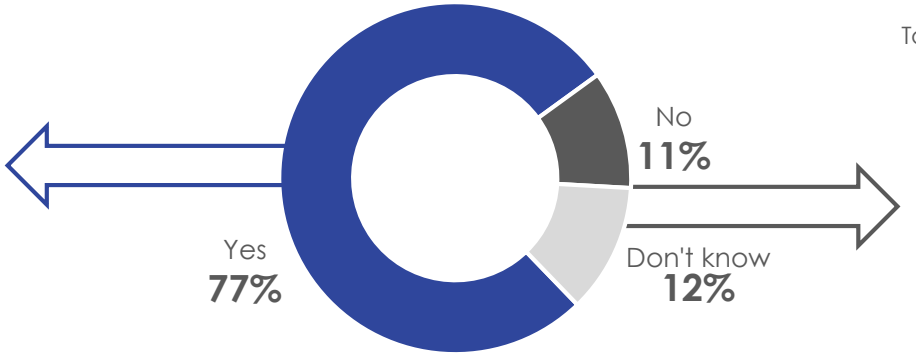
Canadian youth largely see science as a good career to go into.

- Science is seen as a good career for people in their age group to enter (78%), while another 11% say they don't know. Only one in eight (12%) explicitly state that science is not a good career to go into.
- Among those who think science is a good field to go into, most say it is because of the opportunity to discover something new and make a contribution to society. Also mentioned are the fact that it is interesting/intellectually stimulating and well-paid.
- Among those who are unsure or against science as a career, most say it is due to the need for too many qualifications, it being too hard/expensive to get into, and the supposed limited range of job opportunities available.

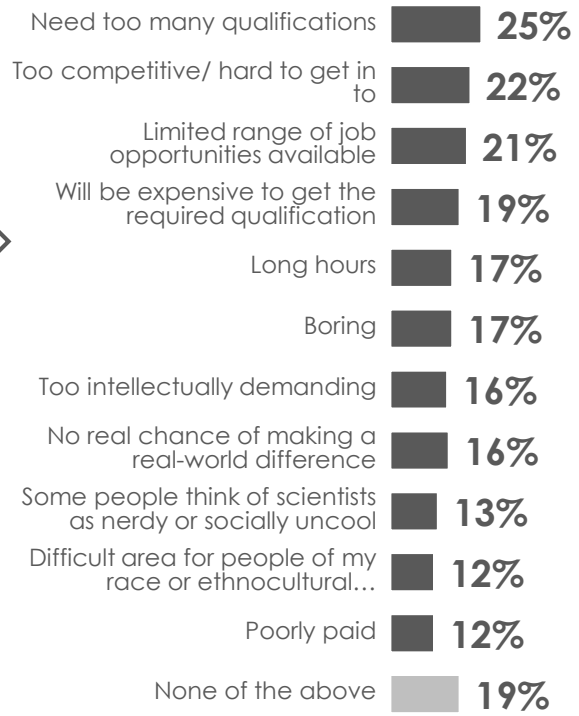
REASONS (YES)



SCIENCE AS A CAREER?



REASONS (NO/DK)



Q16. Do you think that science is a good field for people in your age group to go into as a career?
Base: All respondents (n=1500)
Q17. Which of the following, if any, do you think are reasons why science is a good field for young people to go into as a career?
Base: Consider science a good field for a career (n=1172)
Q18. Which of the following, if any, do you think are reasons why science is not a good field for young people to go into as a career?
Base: Consider science not a good field for a career or don't know (n=328)

Three main themes emerged from Canadian youths' thoughts about science

BARRIERS TO ENTERING SCIENCE

- High cost
- Few funding opportunities
- Competitive environment

*"**Publish or perish**" also keeps myself and others from entering the scientific field.*

*Although a science-based career is what I hope to attain, the reality is that it is **near impossible for the average middle or working class** to actually go into because of **how expensive it is and how scholarships and other awards are hard to come by***

*Careers in science are important but have become **difficult to pursue with just a Bachelor's** degree. It is also **expensive** to attend university especially for more than undergrad.*

Low funding for R&D** for sciences deters from a career in it; **high competition** and needing **high credentials

*As someone who is currently pursuing a degree in math (not sure if that qualifies as "sciences") with peers pursuing science, it's very visible that **the hard work that is required to go into these fields are not worth** the mediocre paycheck, the anti-science sentiments, and the difficulty of the career.*

INTEREST IN A CAREER IN SCIENCE

- Discovery
- Critical thinking

*I have personally worked in the science field for 4 years and it **allowed me to view things with a more critical eye***

*I learned to **think for myself** and not take anything as fact without proper research.*

*I think science can be very biased and untrue, so **it is hard to determine what is real honest science and what is skewed***

MAKING SCIENCE RELEVANT

- Encouraging curiosity/inquiry
- Knowledge transfer/accessibility
- Basis for decision-making
- Trustworthiness

*I believe that **science is what we should base our opinions on**. If **we can't trust science, who would we trust**? … I hope **more young Canadians will look towards science to guide their decisions.***

*People my **age do not do their own research** and easily accept whatever the news and media tells them.*

*I went into the field of nursing because of my love of science. I think **more reliable** scientific information is needed in a format that is seen as **"interesting"** to the general population*

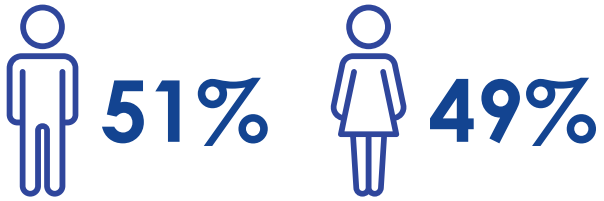
*I think that science should continue to try to make efforts for information to be deliverable **to people with different education backgrounds**. At the end of the day, if the only people reading journal articles about climate change are the people who can understand the material, how many people are you reaching?*

Base: All respondents (n=292)
Q25. We thank you for taking the time today to give us your opinion and tell us about your experience. Thinking about how you interact with science, be it in your everyday life, on social media, in current events, in discussions among friends/family, or when thinking of pursuing a career in the sciences, are there any other thoughts you'd like to share with us?

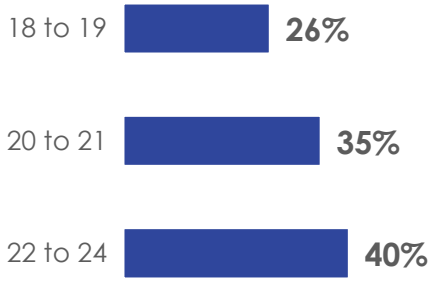
APPENDIX

Sample Composition

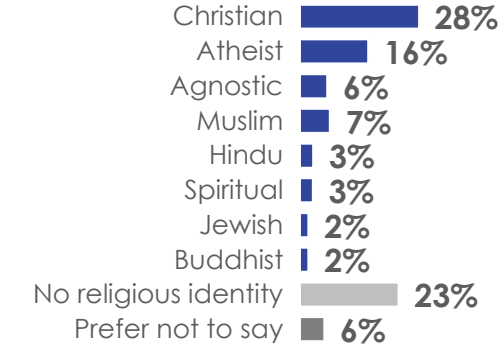
GENDER



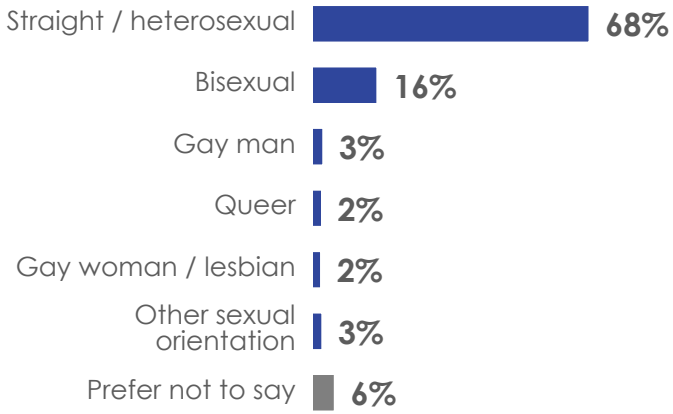
AGE



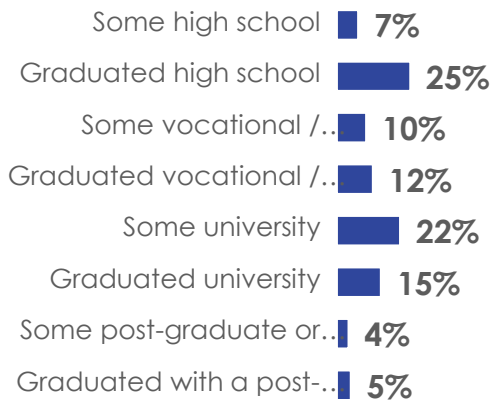
RELIGIOUS IDENTITY/FAITH



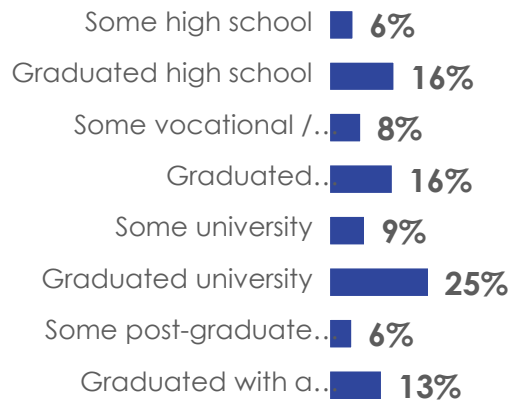
SEXUAL IDENTITY



EDUCATION – SELF



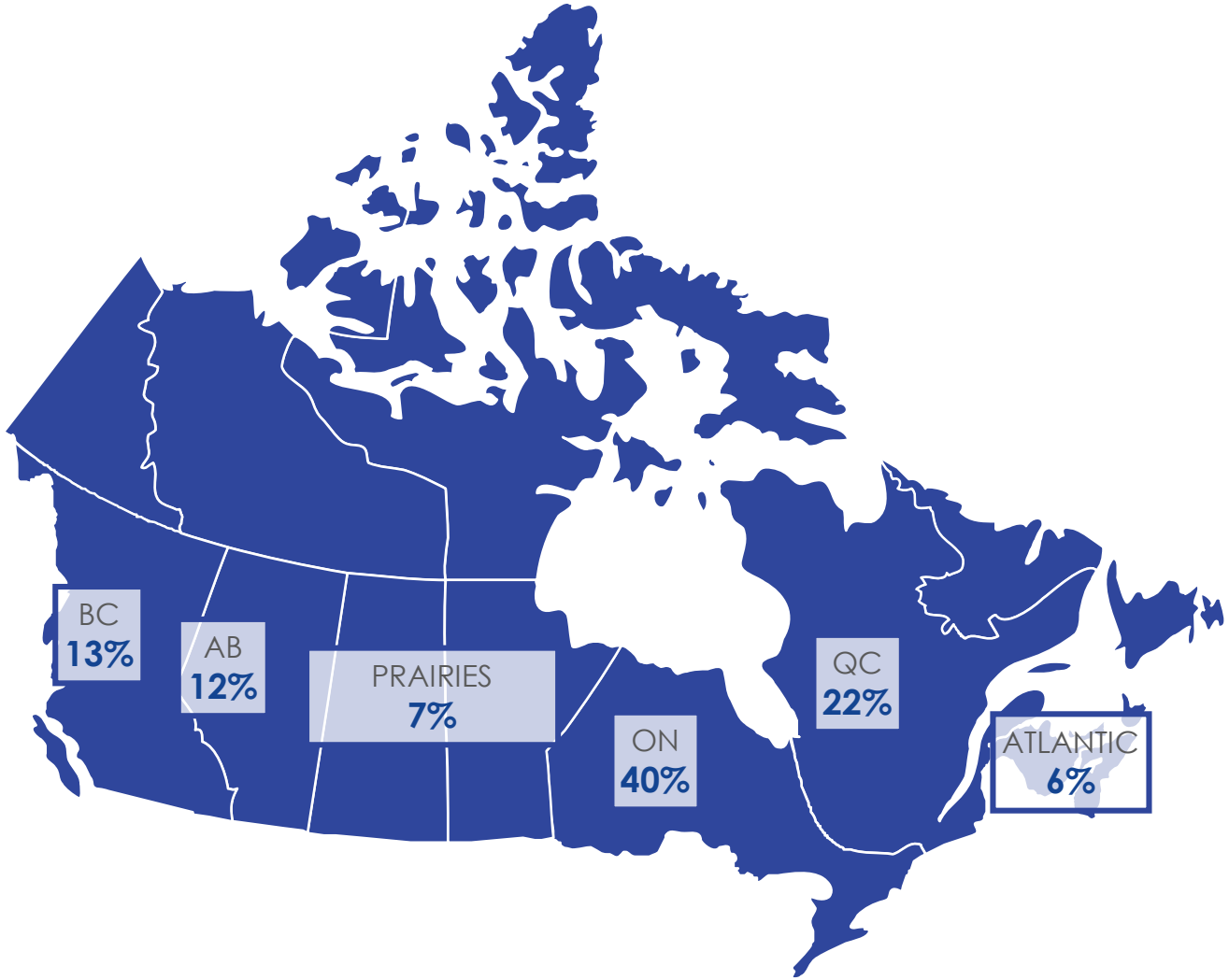
EDUCATION – EITHER PARENT



Base: All respondents (n=1261)

Sample Composition

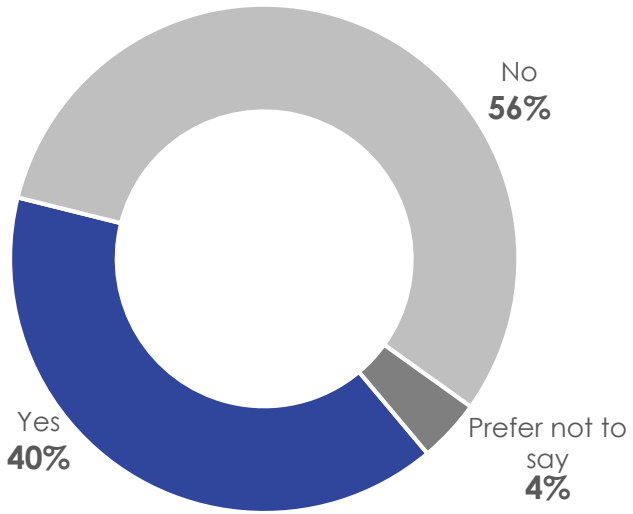
PROVINCE



Base: All respondents (n=1130)

Sample Composition

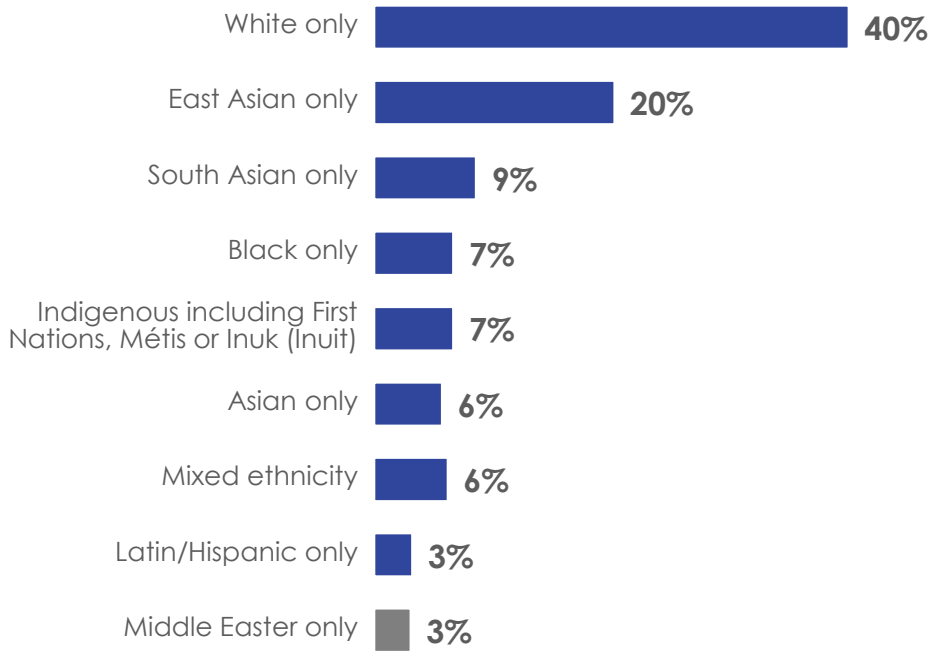
PERSON OF COLOUR/RACIALIZED



Q21. Some people may self-identify as people of colour or racialized persons. For the purposes of employment equity, members of such groups in Canada are persons who are non-white in colour, regardless of place of birth or citizenship. Do you self-identify as a Person of Colour, or Racialized Person? This is not the same question Statistics Canada uses to define visible minority.

Base: All respondents (n=1130)

ETHNOCULTURAL/RACIAL GROUP*



Q22. What ethnocultural or racial group(s) do you identify with?

* Rebased to exclude other and prefer not to say

*Mixed ethnicity is defined as those who chose more than one ethnicity, including at least one non-white ethnicity. Statistics Canada's definition of mixed ethnicity is more than one visible minority sub-group. Therefore, the two figures are not directly comparable.

DRIVER ANALYSIS 1 – BELIEVE THAT COVID-19 VACCINES APPROVED IN CANADA ARE SAFE

Driver	Impact
There is strong scientific evidence that COVID19 vaccines approved for use in Canada are safe	0.52
From the information I have seen, there is consensus among healthcare professionals in Canada that COVID-19 vaccines approved for use in Canada are safe	0.45
All/most of the people I am close to got the COVID-19 vaccine as quickly as they could	0.35
Public health officials have effectively communicated the evidence that supports that COVID-19 vaccines approved for use in Canada are safe	0.27
All/most of the people I am close to believe that COVID-19 vaccines approved for use in Canada are safe	0.26
I have read and watched news and information stories that supports that COVID-19 vaccines approved for use in Canada are safe	0.23
Science can be relied upon because it is based on facts and not opinion	0.17
I have researched COVID-19 vaccine safety (including any online searches)	0.07
I have a strong sense of curiosity	0.07
I easily adopt new technology	0.06
I can tell real news from fake news	0.04
I know how to determine what is a fair and unbiased source of information online	0.04
I can identify valid science from pseudoscience	0.04
Understanding how a science research project was conducted is more important to me than which organization conducted it	0.03
I like to be the first among my friends and family to try something new	0.02
I believe what makes sense to me	0.02
I feel embarrassed when people know more about a topic than I do	0.01
I feel anxious learning new things	0.01
I always check to see if links on a search engine results page I find are paid for or sponsored by an organization	0.00
I feel hesitant to correct someone who holds an inaccurate opinion	0.00
I have a hard time knowing what information I read online I can trust	0.00
I feel pressure to express the same opinions as my family or friends even if I don't agree with them	0.00
I am not good at math	-0.01
At least one of the influencers I follow has expressed the view that COVID-19 vaccines approved for use in Canada are not safe or not safe for certain people (within the approved age group of 12 and up)	-0.04

DRIVER ANALYSIS 2 – SUPPORT BAN ON SINGLE-USE PLASTICS

Driver	Impact
There is strong scientific evidence that single-use plastics have a negative impact on the environment	0.39
I have personally seen or watched media footage or documentaries on how single-use plastics have a negative impact on the environment	0.24
I have researched about single-use plastics (including any online searches)	0.16
At least one of the influencers I follow on social media argues against using single-use plastic	0.12
I have a strong sense of curiosity	0.10
Science can be relied upon because it is based on facts and not opinion	0.10
I easily adopt new technology	0.09
I know how to determine what is a fair and unbiased source of information online	0.08
I generally listen to my intuition or what feels right to me on important decisions related to my health	0.07
My municipality and regional authorities are expanding their programs so that more recyclable and organic waste is diverted from landfills	0.06
I can identify valid science from pseudoscience	0.05
I can tell real news from fake news	0.05
I always check to see if links on a search engine results page I find are paid for or sponsored by an organization	0.04
I believe what makes sense to me	0.04
Understanding how a science research project was conducted is more important to me than which organization conducted it	0.04
All/most of the people I am close to are not careful about reducing the amount of waste they produce	0.04
I like to be the first among my friends and family to try something new	0.03
I have a hard time knowing what information I read online I can trust	0.02
I am not good at math	0.02
I feel hesitant to correct someone who holds an inaccurate opinion	0.02
I feel anxious learning new things	0.02
I feel embarrassed when people know more about a topic than I do	0.01
I feel pressure to express the same opinions as my family or friends even if I don't agree with them	0.01
Just because something is scientifically proven doesn'tmake it true	-0.01
Scientists have not effectively communicated the evidence that single-use plastics have a negative impact on the environment	-0.02

Reading IBN Maps (Quick Guide)

The IBN map consists of:

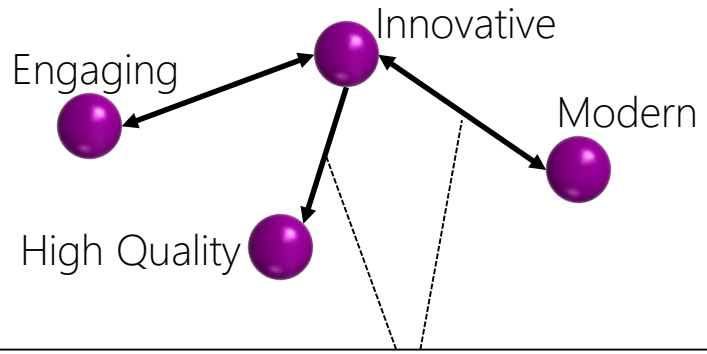
- Circles (or "nodes") representing each variable; and

- Arrows (or "edges") flagging key relationships between the variables, as identified by an automated causal search algorithm

A major element of the Ipsos approach is that we do not rely on the results from a single identified map; instead, we average results across multiple possible maps

In other words, there is no one single model; the figure below displays the arrows/edges that most consistently appear across the multiple maps

EXAMPLE



The presence of an arrow means that across hundreds of random samples of the data, the pair of variables consistently showed a statistical relationship that could not be eliminated by controlling for other variables.

The lack of an arrow means the pair of variables were not directly connected as frequently as others.

However, the pair may still be connected indirectly (through a third item) or through less-frequent paths

Arrows are single or double-headed based on the predominant causal direction across maps.

Across maps (for example) we might see more evidence that perceptions of "Innovative" lead to "High Quality" than the other way around, while "Innovative" and "Modern" show evidence of reciprocal causality. These inferences come from isolating patterns of relationships that logically imply certain causal orientations.

Interpreting IBN Results

- **Impact scores:** Designed to be interpreted similar to regression coefficients – the impact score is the expected change in the outcome measure based on a 1-unit change in a specific driver
  - For models where the outcome is on a 5-point scale, an impact score of .87 means that convincing an individual that BRAND X is high quality would be expected to increase outcome by .87 points
  - For models where outcome is dichotomous, an impact score of .35 means that convincing an individual that BRAND X is high quality would increase the probability the outcome being in category '1' by 35%

- **What does the map show?** The map is a **visual aggregation of the most consistent links** between variables, across 500 separate, individual bootstrapped models

- **What do the circle sizes mean?** The circles (nodes) for each of the driver variables are sized to reflect the relative size of the driver impact (larger circles reflect larger impact scores). These are relative within the particular map and should not be compared with other studies.

Interpreting IBN Results

- **What does the presence vs. absence of an arrow mean?**
  - The presence of an arrow means that we consistently found a significant association between two variables, across multiple random samples of the data, that did not disappear when controlling for other variables.
  - The absence of an arrow means that the two variables did not have an association, or that this association disappeared once controlling for other variables, or that this association was not found consistently across the bootstraps.

- **What does the orientation (direction) of an arrow mean?**
  - A single-headed orientation means that we consistently found evidence, across multiple random samples of the data, consistent with A causing B.
  - A double-headed orientation means that the across the bootstraps no one direction dominated and impacts reflect reciprocal influence between two attributes (e.g., 50% of bootstraps had A->B, 50% had B->A).

- **What does the length of an arrow mean?**
  - Nothing. Whether two connected nodes/circles are located close to each other or far away is not significant. Circles/nodes are arranged to minimize visual clutter.

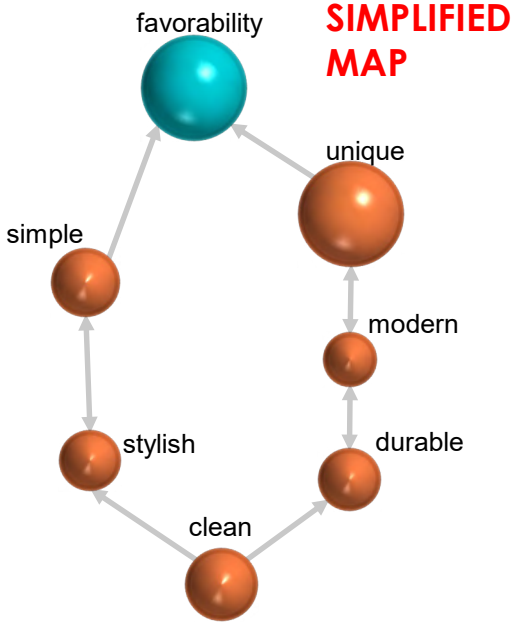
Interpreting IBN Results (continued)

What does the distance (number of arrow steps) between a driver and the outcome mean?

It does not indicate which drivers are "important"!

(1) While directly-connected drivers have a unique impact on the outcome variable, that impact does not have to be particularly large (as an analogy, think of a statistically significant – but substantively small – regression coefficient).

(2) While indirectly-connected drivers do not have this consistent unique impact, they may still have high impacts via multiple indirect pathways (i.e., if they are a root cause of many other driver variables), or via a strong relationship that was just not consistent enough to be presented on the map



In this simplified version of an example map, we see that the two directly-connected drivers (simple & unique) have different impact sizes, while the most "distant" driver (clean) has more of an impact than some "closer" drivers, due to its location as a root cause

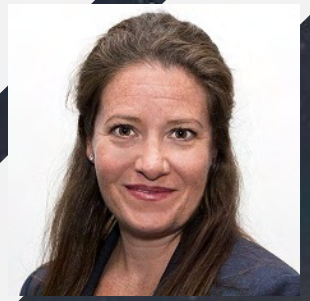
Interpreting IBN Results

- **What does it mean if a particular driver is not connected to anything on the map?**
  - Technically, all this means is that none of the edges connecting this driver to other variables were common enough to meet the complexity threshold that has been set for the map.
  - Unconnected drivers still typically have nonzero drivers scores (and may even be strong drivers). Even though they do not have a consistent pathway to the outcome, they may have a number of less consistent pathways that add up to something nontrivial.
  - Nontrivial unconnected drivers *can* be displayed with a dotted line showing where the unconnected driver would have eventually connected to the map if the complexity threshold were lowered.

- **Does the map imply needing to follow a specific path to the outcome?**
  - No, because the impact scores are derived by simulating changes in a driver and then propagating the impact throughout the entire map, the impact scores represent the "total effects" of each driver.

  - The primary benefit of the structural map is in identifying potential connections between drivers that can be leveraged for strategic growth (in conjunction with the quad maps which can help identify opportunities).

Your Ipsos Team



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Game Changers

In our world of rapid change, the need for reliable information
to make confident decisions has never been greater.

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So that our clients can act faster, smarter and bolder. Ultimately, success comes down to a simple truth:
You act better when you are sure.

