Digital equity: focusing on every Canadian's digital future

Deloitte.

CONTENTS

Note to the reader

There are various hyperlinks throughout the report. Underlined hyperlinks will take you to a designated page within the report and green hyperlinks will take you to an external web page.

L

ike many in Canada these days, *Adreena** has some concerns about navigating the internet. An Indigenous mother living in Ontario, she's careful to ensure no information about her child is shared online. She's strict about privacy settings and prudent about any content she uploads. Her caution stems from concerns such as not really knowing who you're talking to online, getting alerts that third parties could be monitoring you, and hearing about a growing number of data breaches.

Despite these misgivings, she uses social media, shops and banks online, and generally makes use of her access to digital technology: "What I feel I need to use the 'net for, I'm able to use it."

*The names here reflect real people and real quotes, but they have been changed for privacy.
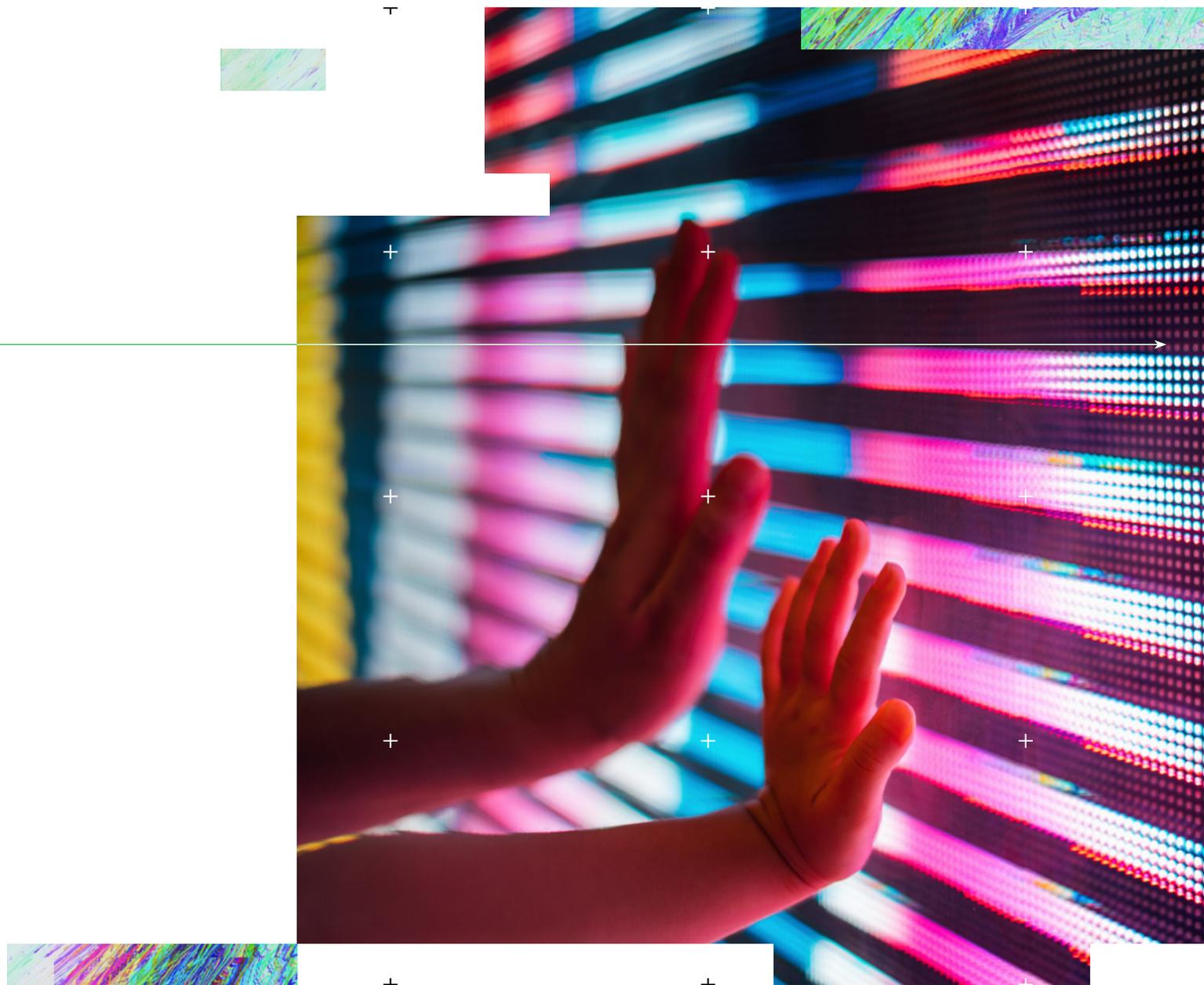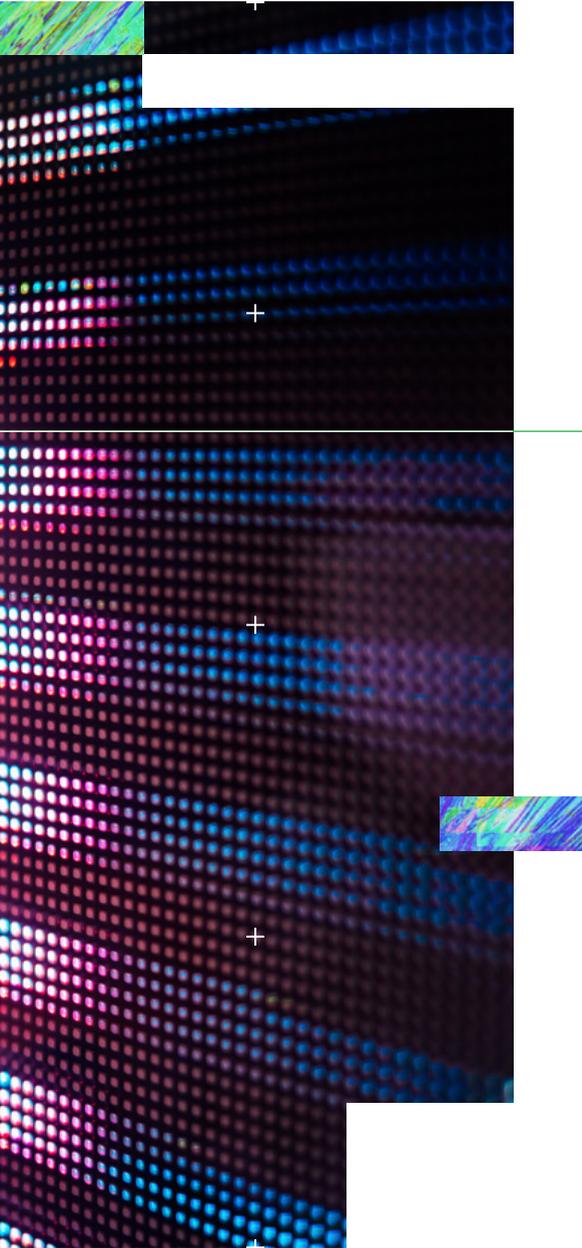
Read about our full aspiration for a stronger and more equitable future for Canadians in A vision for a thriving Canada in 2030.

Adreena understands that, ready or not, the digital world is changing fast. *Canadians** have seemingly limitless information at their fingertips. They can interact with people around the globe in seconds, express themselves creatively, and access goods and services with a convenience that would have been unimaginable even a decade ago. But not everyone can. Some people lack affordable and fast internet, while others don't have the digital skills or confidence to use the internet to their advantage. And all of us face growing risks to our online privacy, security, and well-being.

In this report, we consider these issues through three pillars of digital equity: access, participation, and ecosystem. We established this framework in *Digital equity: spotlighting Canada's divide*, where we made the case for a digitally equitable country by 2030. This second part of the series focuses on attaining that future for all Canadians, with particular attention given to the groups that consistently face disproportionate barriers. Indigenous peoples, people in the 2SLGBTQ+ community, racialized people, recent immigrants, people with disabilities, those with low income, older adults, and women all face unique digital equity challenges that can deepen existing disparities.

Canada can lead by example on the global stage by ensuring all Canadians are able to safely and effectively navigate the digital world. Our recommendations seek to address some challenges that have been around for years, particularly those in the access and participation pillars, and others that are actively evolving, especially in the ecosystem pillar. We hope policymakers and business leaders can use these recommendations to remove the digital barriers facing Canadians and to pioneer best practices that other countries may follow.

Throughout this report, the term **Canadians refers to both citizens and non-citizen residents of Canada (and all nations therein).*

METHODOLOGY

Literature review

To inform this report, we conducted an in-depth literature review of academic journals, media reporting, government policies, and think tank reports. This secondary research helped us identify the greatest digital equity challenges, as well as begin to form recommendations to build a more digitally equitable country.

Advisory committee

For our first report on this topic, *Spotlighting Canada's divide*, we drew on the expertise of an advisory committee. We gratefully acknowledge the continued input and contribution of our committee members from the following organizations: *ABC Life Literacy Canada, The Council of Canadian Innovators, CIO Strategy Council, First Nations Technology Council, MediaSmarts, and Palette Skills.*

Surveys of Canadians

In late 2021, we conducted two surveys of almost 2,000 Canadians each to assess their access to and comfort with digital technology. Respondents provided their age, annual household incomes, level of post-secondary education, self-identified national or ethnic background, and other demographic traits. An in-depth analysis of the survey results, *Diving into the numbers: digital equity visualized*, is available on page 62 of this report, while the highlights are included throughout the report.

For a look at the raw data, please write to *digitalequitydata@deloitte.ca* for *Digital equity: raw data collection*. The principal findings are outlined here:

Income: Age, ethnicity, and rural/urban are among the foremost factors influencing the availability and cost of internet, devices, and digital upskilling. But the most important in determining access— by far—is income. Households earning $200,000 a year enjoyed internet speeds almost 30 Mbps faster than households bringing in less than $20,000. An increase of 30 Mbps would allow a home to connect three additional devices, such as cell phones, laptops, or a home security system.

Age: Seniors in Canada find it increasingly difficult to navigate emerging technologies and online spaces. Only 28% reported enjoying setting up new devices, compared to 42% of working-age Canadians. Seniors also showed more frustration when navigating the digital world: they were 8 percentage points less likely to feel they could navigate online tasks such as banking, 5 points more likely to have their accounts hacked, and generally felt less safe online.

Ethnicity: We found that digital equity issues have a greater impact on certain ethnic groups. The number of Canadians from Asian, Middle Eastern, or North African origins who reported online discrimination or bullying was 25 points higher than the national average.

Numerous respondents agreed to follow-up interviews, which informed the stories and quotations used in this report. Note that their personal details were anonymized before the interview notes were shared with Deloitte.

METHODOLOGY

Expert interviews

In January-February 2022, we conducted 10 interviews with experts from businesses, non-profit organizations, and the public sector to better understand the challenges and opportunities facing Canada over the next decade. The following are some of the themes that emerged.

The impact of the pandemic on digital equity: Interviewees across sectors spoke about the repercussions of the COVID-19 pandemic. They noted the positive effects, including increased awareness of the importance of connectivity and digital literacy, as well as an increased urgency to find solutions to bridge digital divides. But they also recognized that pandemic-related restrictions exacerbated digital equity challenges many people and communities were already experiencing.

The importance of affordable broadband: Interviewees consistently identified lack of universal access to high-quality, affordable broadband as the most pressing barrier to digital equity for people in Canada. They recognized internet access as foundational to meaningful participation in the digital world.

The emergence of new educational opportunities: Several interviewees spoke about the growing number of opportunities for post-secondary students and mid-career workers to gain in-demand digital skills, such as the ability to use online collaboration tools. They pointed to micro-credentials, bootcamp models, and other options for part-time or accelerated training to fit people's varying needs, preferences, and circumstances.

The challenges facing non-profit organizations that address digital inequity: Interviewees in this sector spoke about the barriers they're facing in building and running programs to enable access to the internet and devices, and to improve digital literacy and skills for underserved populations. They identified complex, short-term funding models as key impediments to the success and scaling of these programs.

The need for federal leadership: Several interviewees emphasized the need for the Government of Canada to take the helm in tackling digital equity issues, including broadband, digital literacy, online safety, and privacy. Many interviewees also spoke about the importance of accessible online government services, especially social programs.

Our approach to equity

We define digital equity as "a state where all people and organizations can fully benefit from the digital technology necessary to succeed in the digital economy."

At its core, digital equity is an element of overall societal equity. While many of the topics covered in this report can affect people from all ethnocultural and socio-economic backgrounds, we see disproportionate barriers facing certain demographic groups. For instance, while our surveys found that low income was a strong predictor of digital inequity, we know from previous research that systemic inequities—such as racism, colonialism, sexism, ableism, and ageism—and economic disparities are interlinked and intersectional.[1] Some demographic groups are more likely to experience economic disparities due to these systemic inequities, and are therefore more likely to be impacted by digital equity barriers.

Digital equity for Indigenous peoples

Indigenous peoples in Canada face unique challenges in this space, which require distinct and Indigenous-led solutions that are grounded in their inherent rights as the original inhabitants of this land.

The First Nations Technology Council frames digital equity as a state in which Indigenous peoples, communities, and nations are "fully equipped to access and effectively use technology to contribute, thrive, and succeed in today's digital society while preserving self-determination."[2] Critically, it also means that Indigenous peoples have influence over the design and future of technology, and have a meaningful seat at decision-making tables.

As with other inequities experienced by Indigenous peoples in Canada, digital inequity is rooted in the history and enduring legacy of colonialism. Colonial practices and policies, especially those that failed to recognize and respect Indigenous rights, resulted in deep and enduring socio-economic disparities between Indigenous and non-Indigenous peoples in Canada. Without progress on digital equity, these disparities will continue to grow.

Righting these wrongs will require an overhaul of the way many policies and business practices in Canada are developed. Throughout this report, we incorporate recommendations specific to Indigenous communities, which are underpinned by a critical need to ensure Indigenous voices are at the forefront of decision-making about improving digital equity.

Important efforts are already underway by many Indigenous-led organizations, such as the First Nations Technology Council, to advance Indigenous technology leadership and self-determination.

THE ACCESS PILLAR

ENSURING CANADIANS HAVE ACCESS
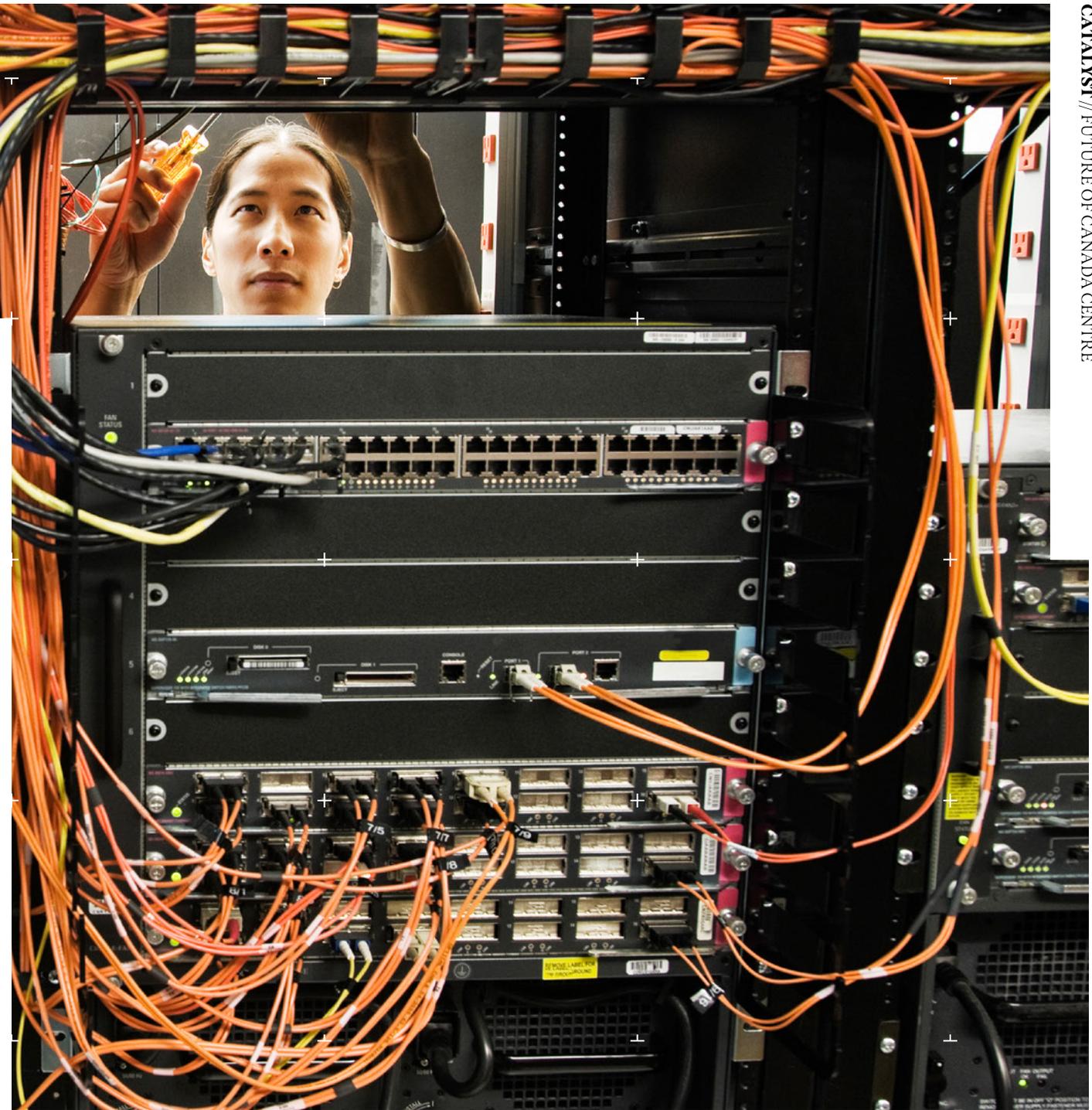
"You could buy a Mercedes Benz—sure, it might be good value. But for me, it's too expensive." Stan, a senior on a modest income, may be satisfied with the quality of his internet service, but he's not impressed with how much he pays for it—especially when compared to other countries. "They get almost the same speed [...] in Costa Rica for one-fourth the amount," he said. "It should be cheaper."

The digital world offers countless social, cultural, economic, and educational opportunities. Many of us take for granted how vital high-speed internet access is to our day-to-day, and even minute-to-minute, lives. But, despite the indisputable importance of the internet to life in the 21st century, many people in this country still lack access to affordable, fast, high-quality service and devices.

Those living outside urban centres encounter particular frustrations. "I live in a rural area and currently we don't have what people have in urban areas: fibre optic or cable and so forth," another of our survey respondents said. "The internet we're having here is like a mobile internet, and the quality is so-so." Yet the biggest predictor of internet and device access is income.

Our survey revealed that every 1 Mbps increase in home internet speed is correlated with an additional $2,500 in total annual household income (see *Figure 1*). Put differently: among all the choices people can make with how they spend their total annual household income, we found that household income needs to increase by $2,500, on average, before people choose to upgrade their internet speed.*

Access is critical to attaining digital equity. While governments and industry are making substantial investments to improve access across Canada, we need to continuously reassess the type of access needed to thrive in the digital environment. The goal posts for access to the internet and devices must keep moving to reflect societal and technological changes. Otherwise, the gap between those who can succeed in the digital world and those who cannot will continue to widen.

Figure 1: Internet speed increases with household income

The black line indicates the CRTC-defined minimum download speed of 50 Mbps

ANNUAL HOUSEHOLD INCOME, PER PERSON (CAD)
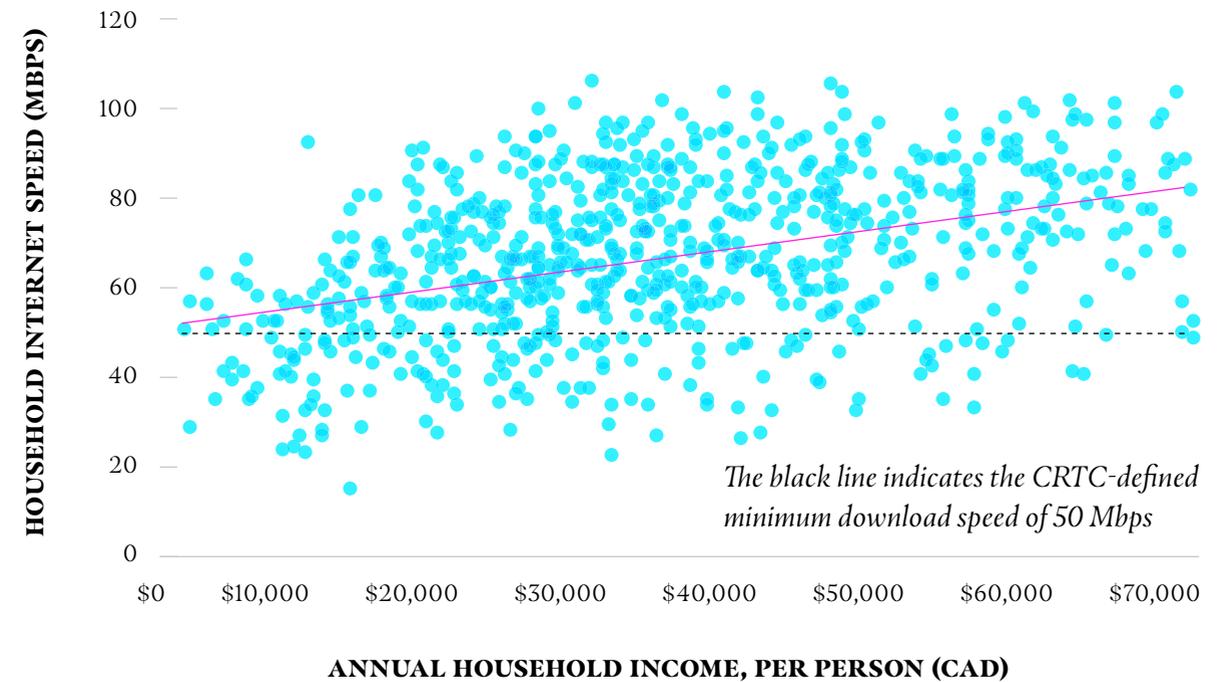
It should be noted that this household income increase is not the same as actual internet package costs, which are significantly lower. For example, in 2021, research found that 50/10 Mbps internet packages in Canada cost $86 per month on average, or $1,032 per year.[5]

Broadband

Broadband internet access is foundational to building a more digitally equitable Canada by 2030. It's the bedrock upon which the other pillars are built. Internet-enabled devices and the skills to use them, while extremely important, only become so after people have affordable, high-quality internet that connects them to the digital world.

The cost of high-speed broadband is a barrier for certain groups

In 2016, the Canadian Radio-television and Telecommunications Commission (CRTC) declared broadband internet to be a basic service, indicating that all Canadians should have access to *minimum broadband speeds.** However, this remains unavailable or prohibitively expensive for many.

In our interviews with survey respondents, they consistently cited the cost of internet as a barrier. In fact, our survey found that household income per capita was the strongest predictor of internet access and speed. While 58% of all households surveyed reported speeds above the CRTC minimum, this fell to 39% for households earning less than $40,000 per year.

Rural and remote areas face unique barriers when it comes to cost and speed, partially due to Canada's size and population dispersion. Rural survey respondent François rates his internet service six out of 10, but he still pays a good chunk for it: $85 per month. "It's like dial-up for a super-high price," he said.

In fact, while 90% of all Canadian households had access to minimum broadband speeds in 2021, only 54% of rural households and 39% of First Nations reserves met this threshold.[4] Furthermore, while Statistics Canada found in 2020 that 76% of Canadians living in a census metropolitan area met the CRTC-defined minimum, only 48% of those living outside these areas did.[5]

But it's not only a rural problem: in Toronto, 38% of all *households*[†] and 52% of low-income households in 2020 had download speeds below the CRTC-defined minimum.[6] Price is an important factor in this disparity, with Canada and Japan having higher prices than other G7 countries for most broadband speeds as of 2021.[7] This disproportionately hurts groups that are affected by systemic inequities such as racism, colonialism, sexism, and ableism, and whose members are more likely to experience low incomes as a result.[8]

*__Minimum broadband speeds__ are defined by the CRTC as at least 50 megabits per second (Mbps) for downloads and 10 Mbps for uploads.

† *Self-reported.*

Current broadband funding models leave communities behind

Small and community-based internet service providers (ISPs) play a crucial role in ensuring affordable, high-quality broadband for underserved groups. They're often needed to connect hard-to-reach communities, where local populations are too small for large ISPs to compete profitably. Canada's Competition Bureau found in 2019 that the presence of small ISP alternatives in an area allowed customers to negotiate lower prices with large incumbents.[9]

However, current government funding structures mean that small providers face significant barriers. The federal government's broadband funding scheme is complex, with a wide range of funding sources, a lack of coordination between sources, and onerous application processes. This disadvantages small ISPs that lack the capacity to work through complex applications. Even when they can access funding, it's often short-term, project-specific, and inconsistent. Without stable, ongoing investment to establish and maintain broadband infrastructure, small ISPs can't provide affordable internet access for underserved communities.

While the CRTC and Innovation, Science and Economic Development Canada (ISED) hold open consultations when considering broadband-related policies, studies have shown that large, incumbent ISPs tend to dominate the discussion.[10] Small ISPs may want to give input, but their ability to participate is often limited due to the time, resources, and capacity required to do so effectively.[11]

Expand underserved groups' access to affordable broadband

For those who face the greatest obstacles, governments and ISPs across Canada should work together to expand affordable broadband service options. The federal government's April 2022 announcement to expand eligibility for the Connecting Families initiative to low-income seniors and families is an important step in the right direction.[12] However, eligibility should be extended to include more low-income Canadians, as the current programs apply only to those receiving the maximum government assistance through the Guaranteed Income Supplement or Canada Child Benefit. Governments could consider other countries' approaches, such as those taken by the United States and United Kingdom, which link similar programs to employment status and other benefits.

Ensuring affordability also requires having an accurate and complete understanding of adoption across Canada. While the CRTC and ISED collect data on broadband availability, they don't collect data on broadband adoption—a more useful metric. Shifting the focus could help governments understand which communities are underserved and why.

Expanding affordable broadband access for Indigenous communities will require greater coordination between governments, ISPs, and Indigenous peoples, as Indigenous voices and expertise must be central to efforts to measure existing gaps and to increase availability.

"

One thing that could be effective is providing individuals who live in remote areas with a tax credit or an individual incentive to subsidize their cost. This could be framed as a remote community internet tax credit and would also encourage more competition between the providers, rather than governments subsidizing one particular provider who may or may not have the best solution.

– Michael Furdyk, Director of Innovation TakingITGlobal and Connected North

Remove barriers for small internet providers

The application processes for providers to receive government funding are often complex. To reduce the burden on smaller ISPs, application instructions could be published further in advance, giving companies more time to prepare. Government programs could expand eligibility for smaller broadband rollout projects, such as those that are limited to a small geographic area, because those are sometimes the only projects that community-based ISPs can provide.[15] And because government turnover or changing priorities can leave small ISPs stranded when funding programs are unexpectedly terminated, funding models should be as long-term as possible.

When designing broadband funding policies, policymakers could also consult small and community-focused ISPs instead of waiting for formal submissions, which require time and resources. It's particularly important to include Indigenous community providers in these consultations, to ensure their communities' needs are met in a way that respects their right to self-determination.

> " *I would stress that digital equity has to be place-based—it has to come from the place, not be inflicted on the place. We, as government, have to be deeply respectful of First Nations communities and what their priorities are in their digital journey.*
>
> *– Susan Stanford, ADM of Connectivity Ministry of Citizens' Services Government of British Columbia*

Satellite internet

Some rural and remote regions in Canada are only able to access broadband through low-Earth orbit (LEO) satellite internet providers, such as Starlink, Telesat, Xplornet, Galaxy Broadband, Skynet, and others. Satellite internet has the potential to disrupt the telecommunications market and provide ultra-fast internet to remote regions, filling in broadband gaps, but it's important that access be equitable. While the cost is currently prohibitively high for many consumers, federal and provincial governments have committed to partially fund the development of this technology in order to expand access.[12] Governments and satellite internet providers should continue exploring ways to fill digital access gaps and lower costs for people in rural and remote areas.

Devices

Access to the internet is only useful if people also have access to the internet-enabled devices that meet their needs—and these needs will vary based on personal circumstances. For instance, high school students, remote workers, retired adults, newcomers to Canada, and people with disabilities all have different technology needs. A mobile device might be sufficient for a senior who only occasionally uses the internet, but a student who only has a mobile device will be at a severe disadvantage when attending a virtual class or completing an online assignment. Most people require more functional devices, like computers or tablets, for everyday activities, such as submitting job applications or writing a report. While access to these devices was already important, the COVID-19 pandemic amplified this need, as many basic services moved online.[15]

Devices are unaffordable for many

The high cost of internet-enabled devices in Canada is a root cause of digital inequity. Often the most vulnerable groups are the ones without adequate access, which exacerbates socio-economic inequities. Our survey found that those in the lowest household income bracket (grouped here as less than $40,000 per year) were twice as likely to cite the cost of devices as a barrier as those in the highest income bracket (see *Figure 2*). We also found that respondents of Middle Eastern, North African, and South Asian descent were more likely to cite cost as a barrier compared to the national average and to people of European descent.

As a result, lower-income households are often forced to share devices among family members. Toronto households earning under $50,000 a year, for instance, have an average of 0.7 computers per person, lower than the national average of 1.0.[16] This had disproportionate impacts on students who had to shift to remote learning during the pandemic; over 4.4 million North American households with children had inconsistent computer access for remote learning.[17] Other students only had access to tablets or mobile devices, which further disadvantaged them in trying to complete schoolwork or attend online classes.[18]

Figure 2: The cost of devices is a limiting factor

THE COST OF NEW DEVICES PREVENTS ME FROM FULLY PARTICIPATING IN THE DIGITAL WORLD (%)

■ Disagree ■ Neither agree/disagree ■ Agree

ANNUAL HOUSEHOLD INCOME (CAD)

Income	Disagree	Agree
$150K+	54%	22%
$100K–$150K	47%	31%
$80K–$100K	38%	35%
$60K–$80K	32%	41%
$40K–$60K	30%	44%
< $40K	23%	48%
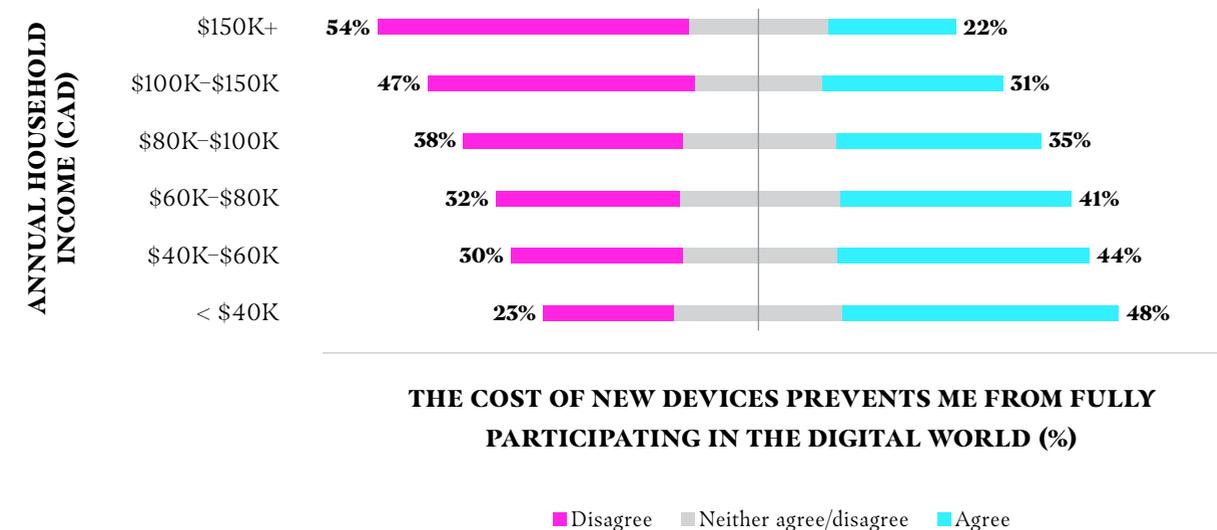
Existing programs are often short-term or limited in scope

While non-profits, governments, school boards, and telecommunications companies worked together to expand access to devices in the early months of the pandemic, many of these programs were not designed as long-term solutions. For instance, at the beginning of the crisis, public-private partnerships stepped up to help vulnerable Canadians get access to cell phones and data plans at either no or low cost, so that they could stay connected to critical services.[19] But programs like these are short-term and limited in scope, leaving non-profit organizations to fill the gaps by providing free, low-cost, or recycled devices—often with insufficient funding and support.
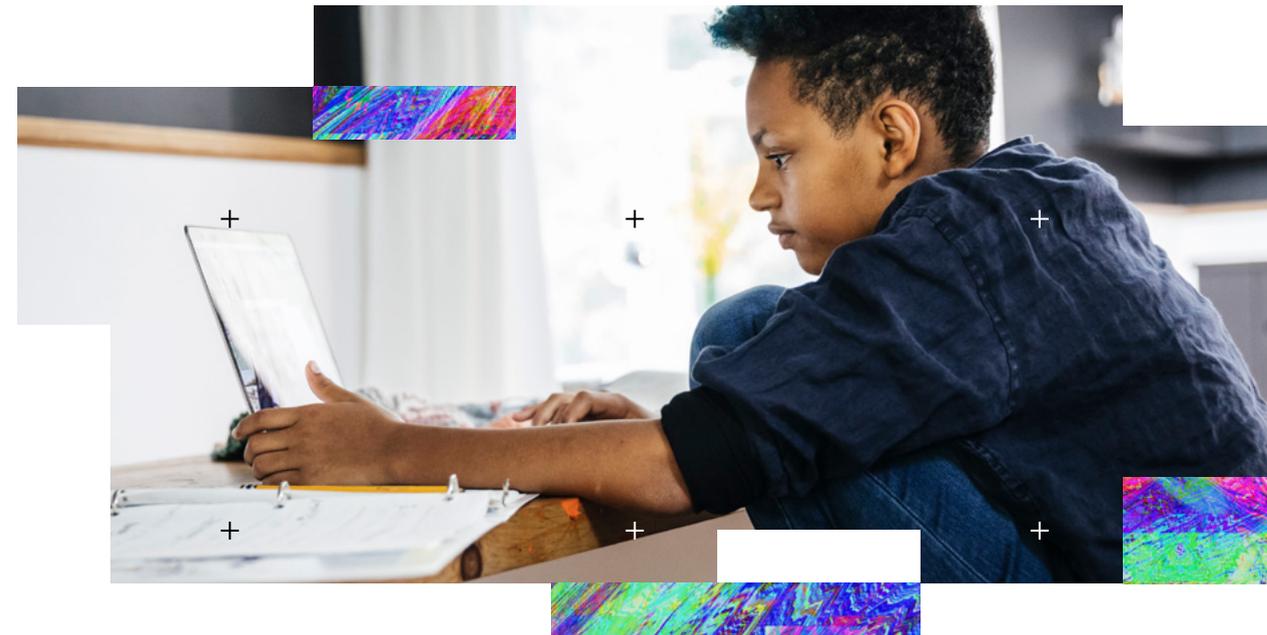
Support programs that provide free or low-cost devices

Governments should strategically increase long-term funding for organizations that provide free or subsidized devices for underserved groups. This could include funding for non-profits that offer low-cost laptops, settlement services that distribute smartphones to newcomers, or libraries that provide short-term device access. Programs that provide free or low-cost device repairs are also critical, as repair costs can be a barrier to adoption.

Programs that recycle devices are another important lever for expanding access. Governments and businesses can encourage people to donate their used devices through public awareness campaigns, and city governments can create a pipeline for companies to donate surplus computers, tablets, and smartphones.[20] Donated devices can then be given to partner organizations for refurbishment and distribution to underserved communities. This should also come with funding for organizations that can remove sensitive or personal data before distributing second-hand devices.

Ensure programs reach those in need

Programs that provide free, low-cost, or recycled devices must be designed in partnership with the communities they seek to help, including low-income individuals, newcomers to Canada, and Indigenous peoples. Without on-the-ground input from these communities, well-meaning efforts could overlook those most in need.

People, especially those in rural and remote locations, may also be unaware of existing government programs, such as Connecting Families and Computers for Success Canada. Governments can help here by funding and supporting a mapping exercise of current programs that provide devices and promoting those programs to underserved communities. Such an exercise would also allow all parties to identify geographic or needs-based gaps in the current ad-hoc ecosystem.

THE PARTICIPATION PILLAR

EMPOWERING CANADIANS TO PARTICIPATE

Edward, a senior whose income is less than $20,000 a year, says he doesn't use his internet access much because "me and computers don't get along." He doesn't feel he has the skills or knowledge to address any technical problems, and since he doesn't know much about computers, he just gives up if he's challenged.

Edward's experience illustrates why the second pillar of digital equity revolves around the skills needed for success in the digital world. Beyond access to the internet and internet-enabled devices, people also need to know how to use digital technology safely and effectively. Just as importantly, they need the ability to keep improving those skills over time as the digital world continues to evolve.

We've identified six categories of digital skills that everyone needs, regardless of their employment status or stage of life:
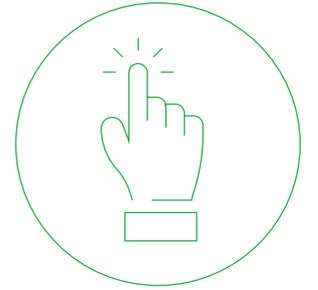
FORMAL EDUCATION & LIFELONG LEARNING

Using digital technology

Interacting with the digital world

Using digital devices and software applications
E.g., using a mobile device or computer, business programs, or project management software

Creating and modifying content online
E.g., posting on social media , creating a presentation, or writing a blog

Solving technical problems and customizing technology to meet needs
E.g., resetting a forgotten password, customizing a mobile device for low vision, or troubleshooting audio issues on a computer

Searching for and evaluating information and content online
E.g., finding directions to the nearest grocery store on a map app, reading the news online, or conducting in-depth research for an academic paper

Interacting with others online and using digital collaboration tools
E.g., sending an email, posting a comment on social media, or joining a video conference

Protecting self and devices against threats and harm
E.g., identifying phishing scams, using strong passwords, or understanding data privacy rights

People of all ages and backgrounds need these skills. While formal education systems are increasingly incorporating digital skills into their curricula, there are still many students who aren't graduating with the skills they need to succeed. And, outside formal education, it can be even more difficult to know which skills are needed and where to go to learn them.

As a result, many people are left to roll up their sleeves and learn for themselves. While admirable, that self-directed learning masks three problems:

* Canadians have disparate abilities and confidence levels in interacting with the digital world.

* The lack of structured learning means that many people navigate the risks associated with digital participation with little guidance.

* Without standard benchmarks to measure digital skills and learning outcomes, we can't measure the progress of learners.

Policymakers know that digital skills are needed to participate in today's economy, and numerous groups are already helping Canadians keep pace with rapidly evolving technology. This section analyzes these efforts in two categories: formal education (kindergarten to the end of high school, or K-12, and post-secondary courses) and lifelong learning (training outside formal education, such as work-integrated learning, continuing education courses, massive open online courses, or MOOCs, and bridging programs for newcomers).

Formal education

It's essential that students begin developing their digital skills in K-12, which is often the first opportunity for young people to experiment with technology in a guided environment. Under the right circumstances, students can learn how to interact with the digital world in ways that are safe, meaningful, and meet their specific needs and circumstances.
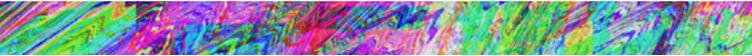
Post-secondary education should build on this foundation of digital literacy* by offering students a more advanced repertoire of digital skills that can be tailored to their personal or professional interests. Regardless of career path, all post-secondary students should develop the digital skills outlined at the start of this section, such as the ability to collaborate digitally, evaluate the accuracy of online information, and create content using digital tools.

This report uses **digital skills and **digital literacy** interchangeably to refer to the six skill categories listed at the start of the participation pillar ("Empowering Canadians to participate"). In general, while digital skills refer to the ability to use digital technology, digital literacy more broadly covers the ethical, social, intellectual, and behavioural considerations involved in responsible technology use.*
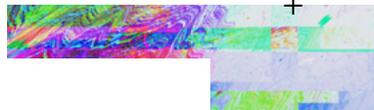
K-12 digital literacy education is inconsistent across Canada

Since provinces and territories are each responsible for designing their own curricula, there is no single consistent way to teach digital literacy across the country. While some jurisdictions are incorporating such training, it's often done at a slow pace that can't keep up with technological changes.

Educators are therefore left to fill in the gaps by designing their own digital literacy lesson plans, often with the help of non-profits and third-party training resources. For instance, MediaSmarts provides thousands of free lesson plans online that are tied to curricular objectives in every province and territory.[21] But educators are not always aware of these types of resources, and the ad-hoc approach can lead to inconsistent outcomes for students. Without standardized resources to guide their work, educators also often feel they don't have sufficient digital skills themselves to effectively teach digital literacy.[22]

> " *I think there is a missing layer of digital citizenship education in the curriculum, and policy and curriculum haven't yet caught up because [social media] platforms have evolved so quickly. … We're putting a lot of trust in the platforms to protect [young people].*
>
> *– Michael Furdyk, Director of Innovation TakingITGlobal and Connected North*

Post-secondary graduates aren't workforce-ready

Universities, colleges, and other post-secondary institutions can be slow to adapt to the changing technical skills needed in the workforce, leaving graduates underprepared. Indeed, our survey found that only 44% of respondents under the age of 35 felt their education had prepared them to succeed in a digital economy. The pandemic has only exacerbated this challenge, with 79% of Canadian employers saying that it has changed the way they work and that they now need more employees with IT skills.[23]

Partnerships between businesses and post-secondary institutions help provide hands-on learning opportunities while giving students job-specific expertise. Recognizing these benefits, large Canadian companies are increasingly collaborating with post-secondary institutions; 86% of large companies reported working with one or more institutions in 2020, up from 76% in 2016.[24] But small and medium-sized businesses don't enjoy the same level of cooperation, partially due to a lack of internal training resources. And greater collaboration, including for larger companies, is hindered by the fact that ad-hoc partnerships are the norm, and these are hard to scale and replicate.

Alternative credentials—such as micro-credentials, digital badges, and industry-recognized certificates—can further help post-secondary institutions be more agile by allowing students to enroll in targeted, short-term programs. But such alternatives face their own difficulties in scaling, standardization, and recognition. These programs, which were introduced under nascent and bespoke policy and funding frameworks in some provinces, are not yet captured under qualifications frameworks. Without a common framework, definition, or quality control, it's difficult for employers to recognize alternative credentials or for governments to extend financial assistance to students enrolled in such programs.

"

By the time you build out a one-year certificate or a two-year diploma, and you get somebody through the program, some of the technologies that you're utilizing have already changed five times before they get into the actual workforce. That's a huge issue. It puts learners at a disadvantage right out the gate.

– James Cairns, IT Security Lead
Bow Valley College

Standardize and support digital skills education

Canadian education systems need more standardized and better-funded digital skills education strategies. This is far too big a problem for individual K-12 school boards or post-secondary institutions to tackle by themselves, let alone individual teachers.

A federal digital skills strategy, designed in collaboration with and implemented by provincial, territorial, and Indigenous governments, could include:[25]

- Ensuring that digital skills and literacy programs are included in both formal and informal education streams, and that teachers and school boards are given the resources and time they need to teach them.[26] This access to resources and time should be as net-new as possible, to avoid adding one more item to an educator's already full task list; similarly, provinces (at minimum) should invest more in highly qualified technical support for educators and students to help ease the transition into digital tools.

- Collecting better data by tracking longitudinal student outcomes and pathways through the landscape of digital literacy education and training programs.

- Establishing best practices, competency standards, and a centralized pool of continually updated digital resources to ensure a high quality of digital literacy delivery across provinces, territories, and the nation.

Make education systems more agile

Post-secondary and K-12 systems also need to be more adaptable to changing labour market needs. We pushed for this in *A vision for a thriving Canada in 2030*, and we echo our recommendation in that report to more closely involve employers in student education. We now expand on the recommendation by proposing that those links be designed in a systemic way, not simply individual program-to-individual employer. The current ad-hoc model makes successful programs difficult to scale and limits the ability to transfer successes or learn from failures. Employers must also communicate what skills they anticipate needing in the future to ensure that programs are aligned with those needs.

Canada could follow other countries, such as New Zealand, in developing a quality control and standardization framework with respect to alternative credentials.[27] A national framework would allow employers to easily recognize and compare skills being taught at different educational institutions and would make it easier for provinces and territories to provide funding assistance to students.

Lifelong learning

Even after students leave formal education, the speed and scale of digital change means that a robust training system for all Canadians is sorely needed, regardless of age or employment status. It's increasingly necessary for mid-career workers to have access to affordable and relevant ways to gain digital skills, such as the ability to use virtual collaboration tools, create a spreadsheet, or identify a phishing email. Those outside the workforce similarly need digital skills for many daily activities that take place online, such as connecting with social groups, shopping, banking, and accessing other essential services.
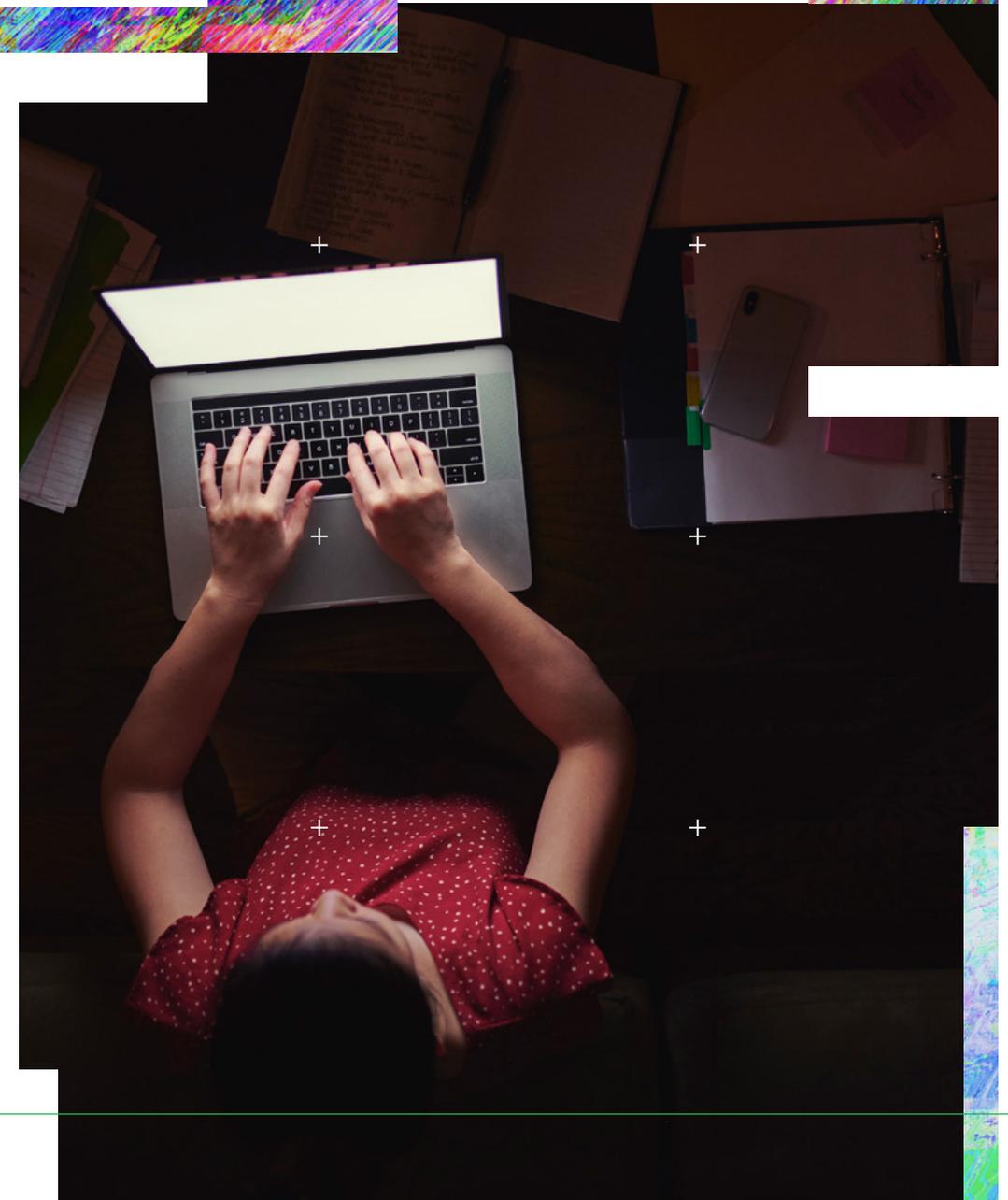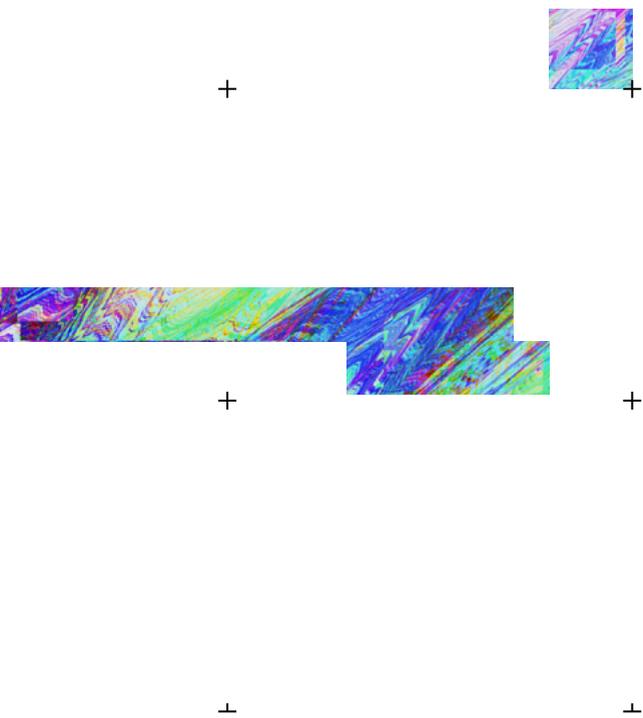
Yet many Canadians don't have the confidence or knowledge to take full advantage of the digital world.[28] Our survey revealed that older people in particular experience challenges. *Roughly three in five respondents over the age of 75 expressed some level of frustration trying to use new technology* (see Figure 3). This is especially true for seniors who have cognitive impairments or low incomes.

Figure 3: Frustration with technology grows with age

I OFTEN GET FRUSTRATED BY TECHNICAL PROBLEMS WHEN USING NEW TECHNOLOGY (%)

■ Disagree   ■ Neither agree/disagree   ■ Agree
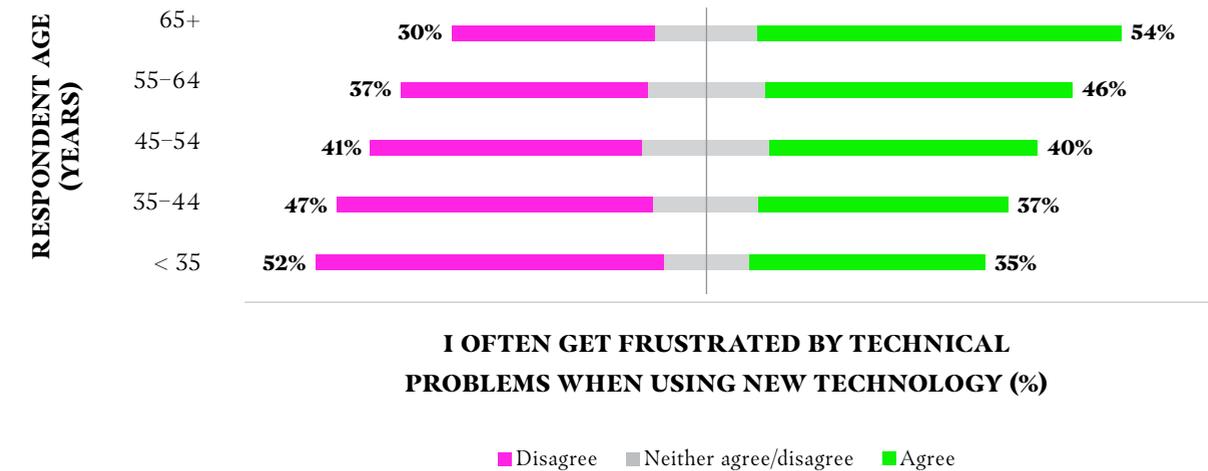
> *"We've seen a lot of gaps in digital literacy—in folks who are from marginalized communities, for sure, but even folks who aren't from marginalized communities, but are just in an age range where they were already used to doing things a certain way when the internet became the main way to communicate for most of us. Plenty of folks have never zipped a file before.*

– Charlotte Nurse, Vice President of Programs, Juno College

People don't know where to get digital skills

Not unlike the challenges facing K-12 and post-secondary education systems, training programs outside formal education are inconsistent and uncoordinated, leaving people—both in the workforce and not—unsure where to turn. Many types of learning programs exist, such as on-the-job training, MOOCs, and digital literacy courses offered by non-profits. But siloed funding and lack of coordination between these providers, employers, and governments have created a fragmented landscape of training opportunities that is difficult for people to navigate. In fact, our survey found that nearly half (47%) of respondents didn't know where to go to get digital skills.

While there are several government-funded programs that provide career guidance for unemployed individuals and can help point them toward the right training opportunities, there's little institutional support for working Canadians.[29] Furthermore, current labour market information focuses on occupations, tasks, and credentials rather than skills. The result is that some third-party training programs are out of date or misaligned with the skills employers are asking for, making it difficult for workers to identify the right program for their needs.

People outside the workforce may be at even more of a disadvantage in trying to improve their skills. One senior, Stan, says he calls on help whenever he needs technical assistance. He said he might try to gain knowledge if he were younger, but at his age, he doesn't feel the need to, nor does he look for solutions through instructional videos, posts, or specific training.

People face financial and other barriers to training

Even after the hurdle of where to get training has been cleared, many Canadians face financial and time constraints that prevent them from enrolling. Training programs often lack funding for sufficient wraparound supports, including hardware and software, transportation, and childcare. Without these supports, many people can't afford to complete training.[30] Our survey found that only 32% of respondents had participated in training in the last 12 months (see *Figure 4*), and 31% cited the cost of training as being prohibitively expensive—a sentiment that rose to 41% in the lowest income group.

Figure 4: Digital skills training decreases by household income

Legend: Yes, within the last 12 months | Yes, more than 12 months ago | No | Unsure
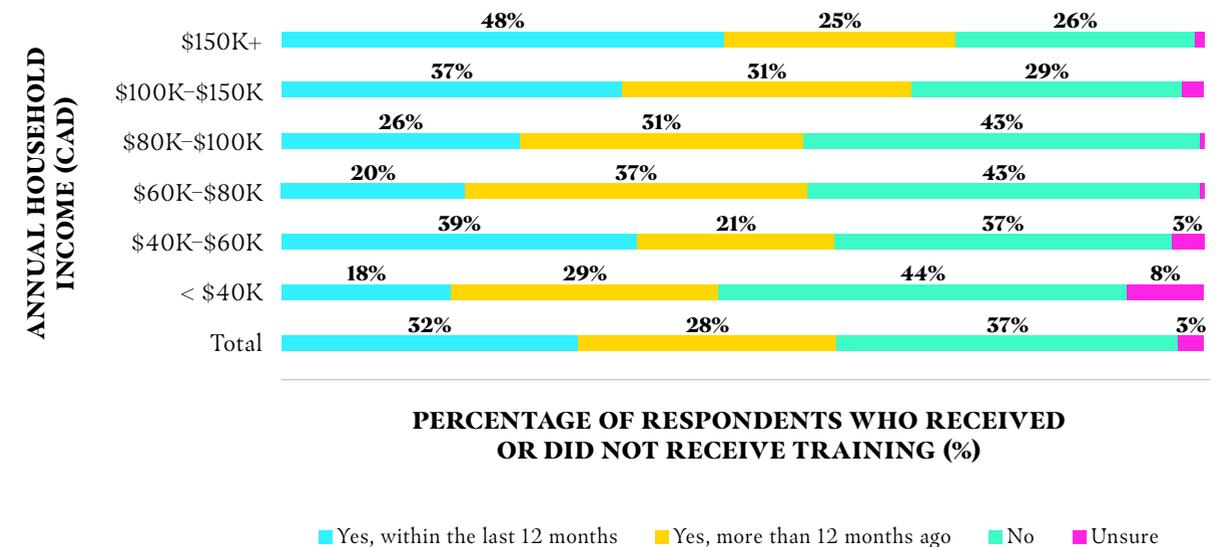
Facilitate clear pathways to training

In the section on formal education, we recommended that federal, provincial, territorial, and Indigenous governments develop a joint digital skills strategy. To ensure Canadians of any age and employment background can find training to meet their needs, this strategy could also provide cradle-to-grave opportunities to acquire and upgrade skills through formal and informal educational opportunities. These should be designed in partnership with educational institutions, businesses, and community organizations. The digital education strategy could also adopt benchmarks and concrete goals for digital skills and literacy among the general population, as do other countries—such as the United Kingdom.[31]

The federal government can also work with provinces, territories, and training providers to map digital skills programs across Canada, helping people find programs easily and allowing for the analysis of program-availability gaps. Businesses and community leaders, including Indigenous leaders, can help spread awareness of available learning opportunities, especially for those that teach participants critical online safety skills.

Remove barriers to training enrolment and completion

Governments should provide higher subsidies and flexible wraparound learning supports to allow more people to participate in lifelong learning opportunities. And, as we laid out in our *Getting hybrid work right* policy brief, these funding supports need to be in place upfront, not in the form of a time-delayed tax credit.

In addition, public and non-profit providers could tailor and market training programs to specific underserved groups and adopt methods to increase completion rates. Grouping students into a cohort of peers, for example, has been found to add accountability and a social aspect to the training process.

Employers also have a crucial role to play in ensuring their employees have the skills they need. We heard in interviews and surveys that employers are concerned about upskilling their employees only to lose them to other companies, but research shows that employees are 42% more likely to stay if they receive training that benefits their work.[32]

Organizations should incentivize employees to use their in-house training in ways that directly link to their work, to boost employee retention and skills development.[33] And organizations that lack in-house resources should partner with third-party vendors and post-secondary institutions to upskill their employees in targeted ways. Businesses of all sizes could also incorporate general digital literacy training into their onboarding programs to help employees protect themselves against cybersecurity and other online safety risks.

" *Inside Higher Ed reports that around 4% of people complete online courses when they do them on their own, and it is usually people with an existing academic history.[34] We developed a model based on Peer 2 Peer University's Learning Circles where we have cohorts who work together, and we have staff who work through the curriculum with weekly meetings. We did it online when the pandemic hit. And we were seeing graduation rates of over 80%.*

– Pam Ryan
Director of Service Development and Innovation
Toronto Public Library

THE ECOSYSTEM PILLAR

BUILDING AN ECOSYSTEM IN WHICH ALL CAN THRIVE

"In a pond, you find the same kind of fish...it's not so complicated." A recent immigrant to Canada who has settled in Quebec, Samuel says it's easy to find and connect with people like himself online through communities where people share interests. Yet he's also cautious interacting with them, by being as vague as possible; in fact, he's careful in general online, and uses an anti-virus program and virtual private network.

Samuel's experience shows how people can have access to the internet and devices as well as the savvy to participate, but that they still hold back, denying themselves the opportunity to thrive in the digital environment. Our research found several challenges that are still holding people back, including risks to their data privacy, cybersecurity, and well-being. The ecosystem pillar examines these issues.

In the access and participation pillars, Canadian decision-makers have the luxury of learning from global best practices and having a general grasp of what needs to be done. But many ecosystem issues—and their solutions—are in uncharted territory, with other countries also struggling with them. This uncertainty about the best way to handle data privacy, cybersecurity, and digital well-being creates the opportunity for Canada to lead the way globally on these pivotal issues.

Ensuring people have meaningful consent and rights regarding how their personal data is used by organizations

1
DATA PRIVACY

2
CYBERSECURITY

3
DIGITAL WELL-BEING

Mitigating cyber risks, such as identity theft, data breaches, fraud, and cyberterrorism

Moderating false information and harmful content with the goal of creating online spaces that foster digital well-being

The ecosystem pillar is closely linked with the participation pillar. Canadians need to have the digital skills to protect themselves against online threats. But we also believe that governments and businesses can minimize these risks. They have the tools and influence to strengthen data privacy rights, defend users from cybercrime, and reduce online harms.

Data privacy

Data is the most valuable resource in today's economy. As our lives become increasingly tied to the digital world, we generate ever-growing amounts of it. Statista, a German provider of market and consumer data, estimated that 79 zettabytes of data were consumed globally in 2021, with one zettabyte approximately equivalent to a trillion gigabytes.[35] Big Tech firms—Alphabet (Google), Amazon, Apple, Meta (Facebook and Instagram), and Microsoft—are the titans of this industry and include five of the six most valuable companies in the world.[36]

The data economy can offer economic and social benefits through improved public and private services, expanded consumer options, and increased efficiency. Modern privacy laws strive to realize these benefits while ensuring people have control over how their personal information is used, by whom, and why.

Yet our survey found that most Canadians don't trust organizations to safely manage their data. Only 32% said they trust companies not to misuse or mismanage their personal information, with not many more—40%—trusting governments to do the same (see Figure 5).

Figure 5: People don't trust governments and businesses to manage their personal information

	Disagree	Neither agree/disagree	Agree
Governments	43%		40%
Private companies	45%		32%

I TRUST GOVERNMENTS/PRIVATE COMPANIES TO MANAGE MY PERSONAL INFORMATION (%)

■ Disagree   ■ Neither agree/disagree   ■ Agree
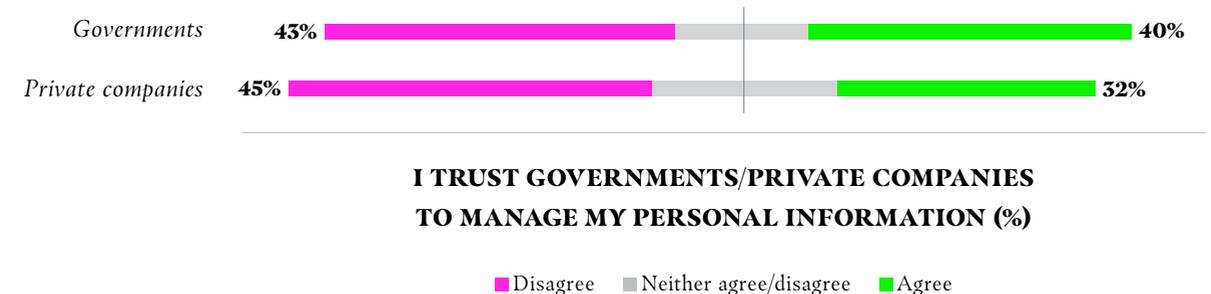
Canada's privacy laws are outdated

Over the past decade, governments around the world have updated their data privacy laws in response to the greater collection, usage, and sharing of their citizens' personal data. These refreshed laws are intended to provide more robust data privacy rights and, at the same time, ensure that businesses can innovate in a way that is responsible and ethical. In Canada, however, despite increasing privacy risks and the outcry from advocacy groups and regulators, the privacy regime remains out of date, lagging international best practices.

In 2020, the federal government introduced Bill C-11 to enact the Consumer Privacy Protection Act (CPPA) and the Personal Information and Data Protection Tribunal Act (PIDPTA), but the bill died on the order paper when the federal election was called for September 2021. The CPPA would be an important step toward privacy law reform in Canada, but legal experts and business stakeholders called for significant revisions before it was reintroduced. The Office of the Privacy Commissioner of Canada (OPC) said that the bill in its current state would "represent a step back overall for privacy protection," as its provisions were often misaligned and less protective than laws in other jurisdictions.[37]

Specifically, the draft bill gave individuals less control over their data, failed to introduce enough accountability for organizations, and did not strengthen the OPC's ability to protect against privacy violations.

In June 2022, Bill C-27, a significant reworking of Bill C-11, was tabled. While this bill includes greater clarity and some stronger protections, it still lacks many of the changes recommended by the OPC.

Without guardrails, automated decision-making poses risks

The risks associated with data privacy are magnified when individual data is aggregated on a mass scale and used to inform *automated decision-making.** While the outcomes of these decisions can benefit users through increased convenience or personalization of options, they can also be used by public and private sector actors in ways that cause individual and collective harm.

For example, a 2016 ProPublica investigation found that an algorithmic risk assessment tool used widely in the United States (COMPAS, or the Correctional Offender Management Profiling for Alternative Sanctions) was more likely to falsely label Black defendants as being at a high risk of reoffending, while white defendants were more likely to be falsely labelled as low-risk.[38] Similar algorithms are being used across Canada, such as in predictive policing software in Vancouver, Saskatoon, and London, Ontario.[39] These algorithms can be biased, as they pull from aggregated police data sets that are influenced by systemic biases. In other words, people from historically disadvantaged communities can be automatically labelled as being at high risk of committing a crime because of historic bias toward those communities.

Algorithms and their decisions are everywhere—in our search engines, social media newsfeeds, movie recommendations, credit scores, and more. But most Canadians don't understand how they work, when and why they're used, or how they can cause harm (for example, by reproducing societal bias, manipulating online choices, or undermining competition).[40] Further, the complexity of automated decision-making systems can make it difficult to retrace the path a system took to reach a decision or outcome.

__Automated decision-making__ is as it sounds: a decision made through automated means and without any human involvement. Examples include a decision made solely by algorithms to provide a loan or recommend a job candidate for an interview.

> "
> *Data has been used against some of these equity-denied communities in very serious ways.*
>
> *– Aftab Erfan*
> *Chief Equity Officer*
> *City of Vancouver*

Ensure Canadians have modern privacy rights

Given Canada's constitutional distribution of legislative powers between the federal and provincial governments, it's critical that these levels of government work together to ensure Canadians have privacy rights in all aspects of life—including commerce, health care, and employment.

While Bill C-27 is a step in the right direction, more can be done to strengthen privacy rights. Specifically, the act could better articulate the weight given to privacy rights and commercial interests, give Canadians stronger privacy rights, and provide quick and effective remedies for privacy violations. This would ensure that Canadians have at least the same level of modern privacy protection seen in other leading jurisdictions, such as the European Union.

Bill C-27 also does not reference the importance of Indigenous data sovereignty, which refers to the inherent and constitutionally protected right of First Nations, Métis, and Inuit peoples to exercise authority over the collection, ownership, and application of their data.[41] Given the importance of data to today's economy, Indigenous peoples must have autonomous control over how theirs is used.

Enshrine the right to contest automated decisions

Bill C-27 also proposes the Artificial Intelligence and Data Act (AIDA), which includes several important elements, notably the right to meaningful explanation. This means people have the right to know what type of information is collected or used in an automated decision, why the information is relevant, and what the likely impact of the automated decision will be.[42] However, the act should go a step further by including the right to contest automated decisions, which would allow Canadians to seek redress if their information was used in a way that was biased, inaccurate, or otherwise inappropriate.

The role of Canadian businesses is in informing consumers how their personal information is used in automated decisions and allowing them to opt out of sharing certain information. They can take the initiative in consumer protection, and not wait for governments to modernize privacy laws. This in fact should be a business imperative, because our research indicates that consumer trust in companies to safely manage their data is declining.[43]

Cybersecurity

As our lives become increasingly digital, we encounter a growing number of threats to our online safety and security. In our interviews with survey respondents, many said they don't feel comfortable using a credit card online because of concerns about the security of their information. One of them, an urban Alberta resident named Brenda, described her reluctance to shop online after having her information stolen: "My credit card number was taken by someone and used, and [sharing that information on the internet is] really the only way that it would have been picked up." And while Brenda says she continues to look at what other people are doing on social media, she won't post herself in large part because she's concerned about her privacy. Such fear can extend to accessing critical online services, such as government, health care, or banking services.
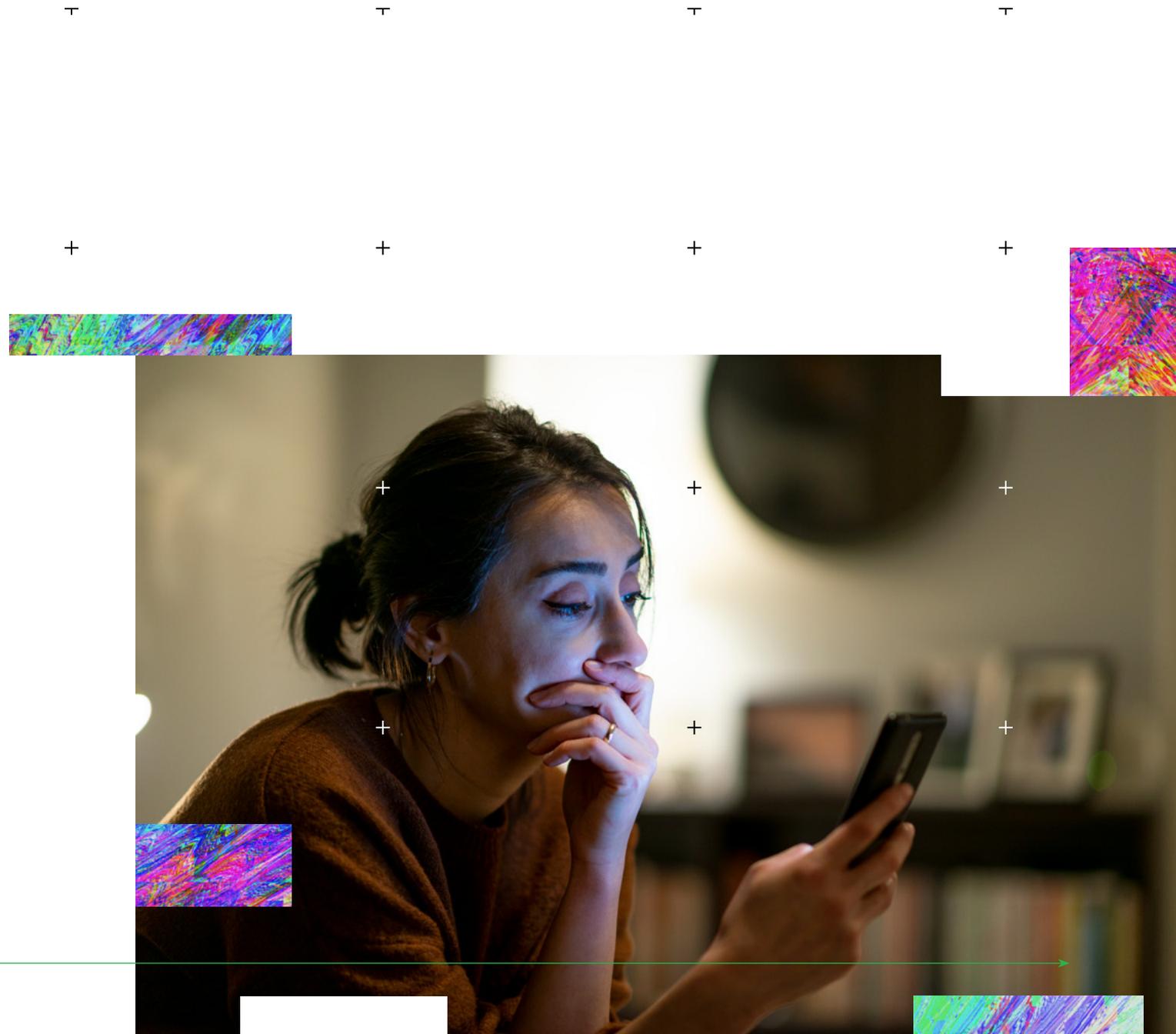
Cybersecurity risks include identity theft, data breaches, fraud, trafficking, piracy, counterfeiting and forgery, spam, and cyberterrorism. And while each of these has unique legal implications and challenges, this section of the report will focus broadly on cybersecurity risks that Canadians face and the actions policymakers and business leaders can take to reduce those risks.

Canada is lagging on cybersecurity measures

Canada is falling behind other Organisation for Economic Co-operation and Development (OECD) countries on cybersecurity investments, as one of the few countries where investment in technology research and development (R&D) is stagnant.[44] According to the 2021 Edelman Trust Barometer, 65% of Canadians are worried about falling victim to a cyberattack; this is an even bigger worry than COVID-19 and climate change.[45] These concerns are not unfounded: the number of cybercrime incidents in Canada almost tripled from 2016 to 2020.[46]

Research shows that cybersecurity events don't affect all demographic groups equally. Our own research found that only half of adults over 65 felt they were able to protect themselves from or respond to cybersecurity incidents, compared to two-thirds of the wider population and three-quarters of people under 35. Women were also less likely (59%) than men (69%) to feel they could protect themselves against cybersecurity incidents. A 2021 global survey found that racialized people were more likely to experience financial cybercrime, with only 47% of racialized respondents reporting no financial impact from it compared to 59% of all respondents.[47]

There's no integrated digital identity system

Canadians also don't have a secure, integrated digital identity (ID) ecosystem. While digital ID is only one element of a robust national cybersecurity strategy, it's a vital component of protecting personal information during online transactions. The federal government does use digital ID solutions, but it's limited in scope and there's been little progress to expand it to more public and private services. Several provinces have therefore taken steps to create their own systems, including British Columbia and Ontario. But these aren't yet interoperable, since there are no agreed-upon standards.
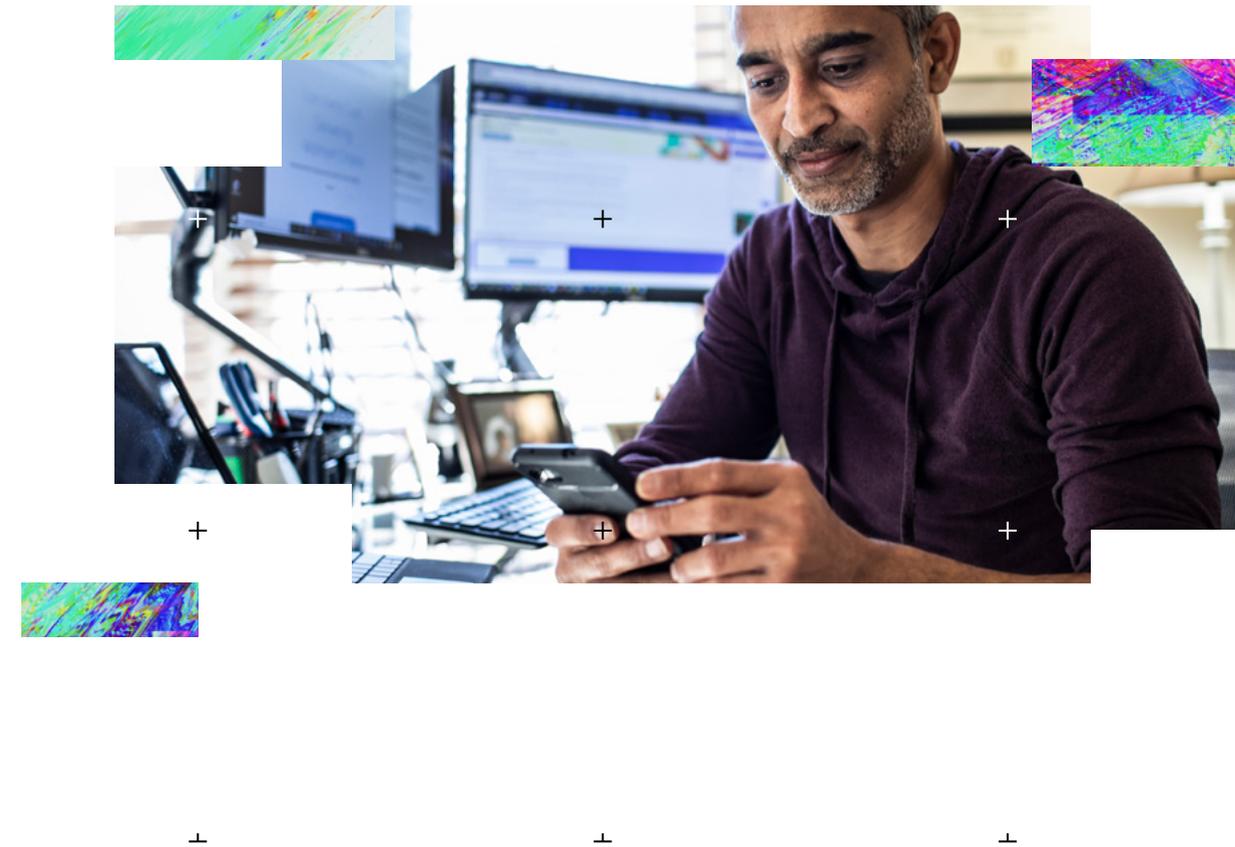
Increase investment in cybersecurity measures

The federal government should increase its cybersecurity investment to match that of its G7 peers. Both the 2021 and 2022 federal budgets contain substantial investments in cybersecurity, and it's encouraging that the latest one includes investment to prevent and defend against cyberattacks on Canadian individuals and businesses as well as on government infrastructure. These investments take on extra importance in light of growing foreign cyberthreats and geopolitical risks. However, there should be a greater investment in raising Canadian businesses' threat awareness, protection, and training to prevent data breaches and other harms to the security of their clients and clients' families. This is especially the case for small and medium-sized businesses, which are more vulnerable to cyberattacks.

Businesses can also learn from the banking sector. A 2020 Privacy Commissioner of Canada survey found that 81% of Canadians have at least some trust that banks will protect their personal information, a much higher level than in other organizations.[48] Not only do banks invest more in cybersecurity than other sectors, but they also emphasize strong cyber governance practices, often with a chief security officer overseeing these efforts.[49]

Establish a secure digital identity system that works for everyone

Another way to strengthen online protection for Canadians is through a secure, trusted digital ID that can facilitate safe online transactions. Provincial and territorial digital ID systems should be interoperable and meet common standards. Federal, provincial, and territorial governments, as well as businesses, should work together to establish one common framework, which would save time and money for both the people accessing online services and the organizations providing those services.

Offering better protection than physical alternatives, a digital ID framework could especially benefit demographic groups that face disproportionate cybersecurity risks, such as identity theft. But, as we move toward such a system, we need to ensure that no one is left behind. Because of privacy concerns, a lack of comfort using digital ID, or a lack of digital access, some people will continue using paper-based or password-based methods. Any policies involving digital ID must therefore ensure that in-person verification methods remain available.

"

For digital identity, the Province of British Columbia has done a great job rolling out the BC Services Card and there may be an opportunity to federate this model among municipalities to enable broader access to services for the public.

– Tadhg Healy, Chief Technology Officer, City of Vancouver

Digital well-being

Digital well-being* is a cornerstone of a more digitally equitable Canada. While closely linked to many of the topics covered in this report, this part focuses specifically on the impacts of social media on well-being and safety. Broadly defined as any online space where people interact and share content with each other, social media has dramatically changed how we communicate and consume information. It has empowered people across demographic groups to use these platforms daily to share their opinions, express themselves, and connect with their friends, families, and communities.

*__Digital well-being__ is defined as the "optimal state of health and well-being that an individual using digital technology is capable of achieving," according to MediaSmarts' report The Digital Well-Being of Canadian Families.
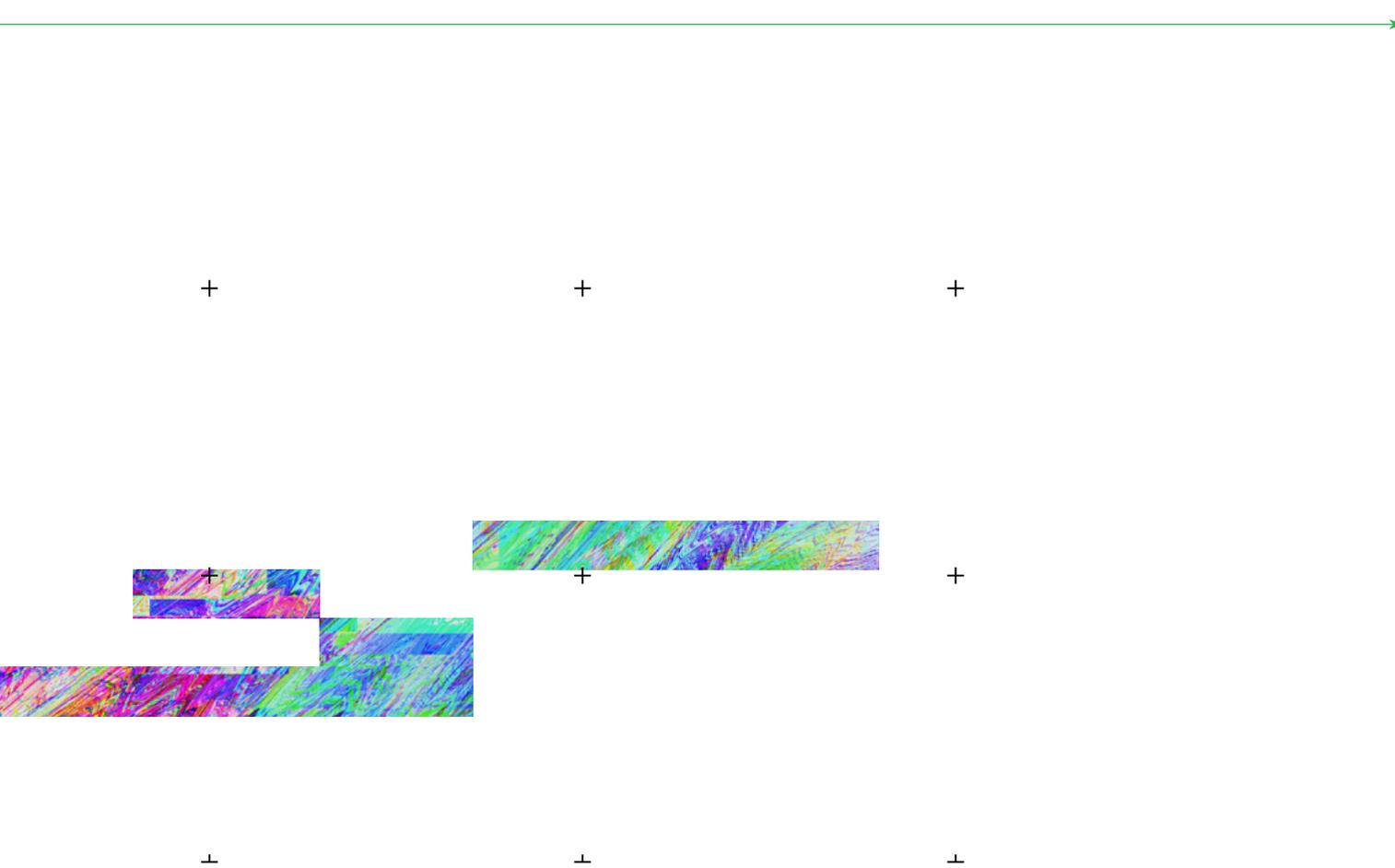
But social media usage comes with risks. People can encounter false information and harmful content that can have a damaging effect on their well-being. And, unlike the internet (which is, by design, decentralized), social media platforms are overseen by a central agent—typically, the company operating the platform. The moderation of false or harmful content therefore falls to these companies, even when competing commercial interests are at play.

Creating a safe online experience is no easy feat. It's not an area where we can look to best practices from around the world, since it's too early to judge whether other countries' solutions to combat false information and harmful content will work over the long term. This is further complicated by the fact that many social media platforms are not Canadian, limiting our government's ability to influence content-moderation decisions. We must find a way to overcome these challenges as a nation and design online spaces that promote digital well-being for all.

False or misleading information is spreading despite efforts to slow it

*False information** online is pervasive, to the point where almost all internet users, around the world, report falling for it.[50] And it can be incredibly harmful, not only to mental well-being but to physical safety as well. Early in the pandemic, for example, it was widely— and falsely—shared on social media that COVID-19 patients were ingesting household disinfectants as a treatment. Around the same time, the Centers for Disease Control and Prevention (CDC) reported a steep increase in calls to poison centres regarding exposure to disinfectants. A 2020 CDC survey found that 39% of respondents had engaged in dangerous practices, such as washing food products with bleach, inhaling or ingesting disinfectants, or applying household cleaners directly to their skin, presumably because of what they had read online.[51]

But there is currently no legal remedy for spreading false information in Canada. Other countries, including Australia, Denmark, and the United Kingdom, have introduced online safety bills, although these have been criticized for being overly broad, compelling platforms to over-censor, stifling smaller platforms, and being ineffective in protecting users. Canada introduced a bill ahead of the 2021 election that received similar criticisms, including the fact that it failed to address the core issue: that the business models of social media companies centre on maximizing user engagement rather than on moderating the quality or veracity of content.[52] As of the writing of this report, the federal government planned to reintroduce online-harms legislation, starting with an expert panel that was unveiled in March 2022.

While some platforms are actively combatting false information—by investing in detection, sourcing information, informing users of suspected false information, and shutting down accounts that were specifically created to spread disinformation, for example—these efforts have been limited in their effectiveness. This is because of the sheer amount of content that must be reviewed, the difficulty that algorithms have when detecting nuances of false information, and the complexity of determining which content should be removed. As a result, bad actors are able to manipulate algorithms in ways that exploit cognitive biases and help false information spread.[53]

__False information__ on social media can be divided into two categories: misinformation and disinformation. Misinformation is false or misleading information that is shared, regardless of whether there is intent to mislead, whereas disinformation is deliberately created and distributed with an intent to mislead.

Harmful online content poses risks

Internet users increasingly encounter harmful content online, in the form of cyberbullying, harassment, and discrimination. A 2019 Cybersecure Policy Exchange survey found that more than one-third of respondents encountered harmful content at least once a week, while almost 60% reported seeing harmful content at least monthly.[54] Those who used Facebook, Twitter, and YouTube as news sources were significantly more likely to encounter online harms at least weekly.

As with many digital equity issues, cyberbullying and online harassment have disproportionate impacts on marginalized groups. For instance, many people experience online discrimination solely because of their race, religion, or nationality. Our survey found that Canadians of Middle Eastern, African, or Asian descent more likely (45%) to have been bullied or discriminated against online compared to white or European Canadians (18%) (see *Figure 6*).

Addressing harmful content that is not covered under cybercrime laws is complicated. Content moderation or removal can affect rights to privacy and freedom of expression, and can easily slide into censorship. The United Nations Office of the High Commissioner for Human Rights has said that nearly every country that has adopted laws relating to online content has jeopardized human rights in doing so.[55]

Figure 6: Online discrimination is linked to national origin

PERCENTAGE REPORTING ONLINE DISCRIMINATION (%)

Legend:
- Experienced bullying in the last 12 months
- Experienced bullying more than 12 months ago

Categories: Indigenous; Mediterranean, Mid. Eastern, N. African; Latin American/Caribbean; African; Asian; French-Canadian; Western European; United Kingdom; National average; English-Canadian; Prefer not to say; Central/Eastern European

Improve content moderation while respecting freedom of expression

To combat false information and harmful content, regulations should focus on improving content moderation (including identifying false information more quickly) rather than adding content-specific restrictions.[56] Businesses should also be transparent about how they moderate content, while governments should be transparent about their requests to restrict content or access users' data. Crucially, civil society and experts should be involved in the design and evaluation of these regulations.

Content moderation is a fast-moving issue, and what governments and organizations do now to respond could quickly become obsolete, or worse, harm users further. Canada will need to quickly adapt to new developments and learn from other countries' successes and missteps. To be nimbler, governments can use certain policy tools, such as regulatory sandboxes, trials of new rules and legislation, and sunset clauses. Policymakers should also work closely with experts, such as research institutions, non-profit organizations, and social media platforms, to quickly respond to new issues.

"

I'm thankful that there has been an acknowledgement of the need to go fast, get things done, but also to learn from what we've delivered, and to figure out what some of those magic ingredients are that enable us to go fast and build things in weeks and days, rather than years.

– Hillary Hartley
Chief Digital and Data Officer and Deputy Minister
Ontario Digital Service, Government of Ontario

Provide guidance and support for digital well-being

To help build online spaces that promote digital well-being and protect users from harm, governments across Canada can invest more in mental health supports, especially for young people, who are particularly vulnerable to the negative effects of social media and internet usage. To guide the design of these supports, governments and social media companies should fund independent research to better understand the impacts of internet use on mental health and well-being.

Social media companies should also more actively enforce age limits and ensure that users understand the inherent risks of their platforms. This includes raising private and public investment in education for people of all ages so that they understand the potential negative effects of social media and internet use, can identify false and harmful information, and feel confident in their ability to safely navigate online spaces.

Distinct solutions are needed to create a digital environment that supports well-being for Indigenous peoples, and particularly Indigenous youth. Social media and other online spaces can facilitate community building, social connectedness, and traditional language sharing,[57] but efforts to reduce the impacts of false information and harmful content must be developed and implemented by Indigenous communities, while respecting the protocols of knowledge stewardship.[58]
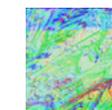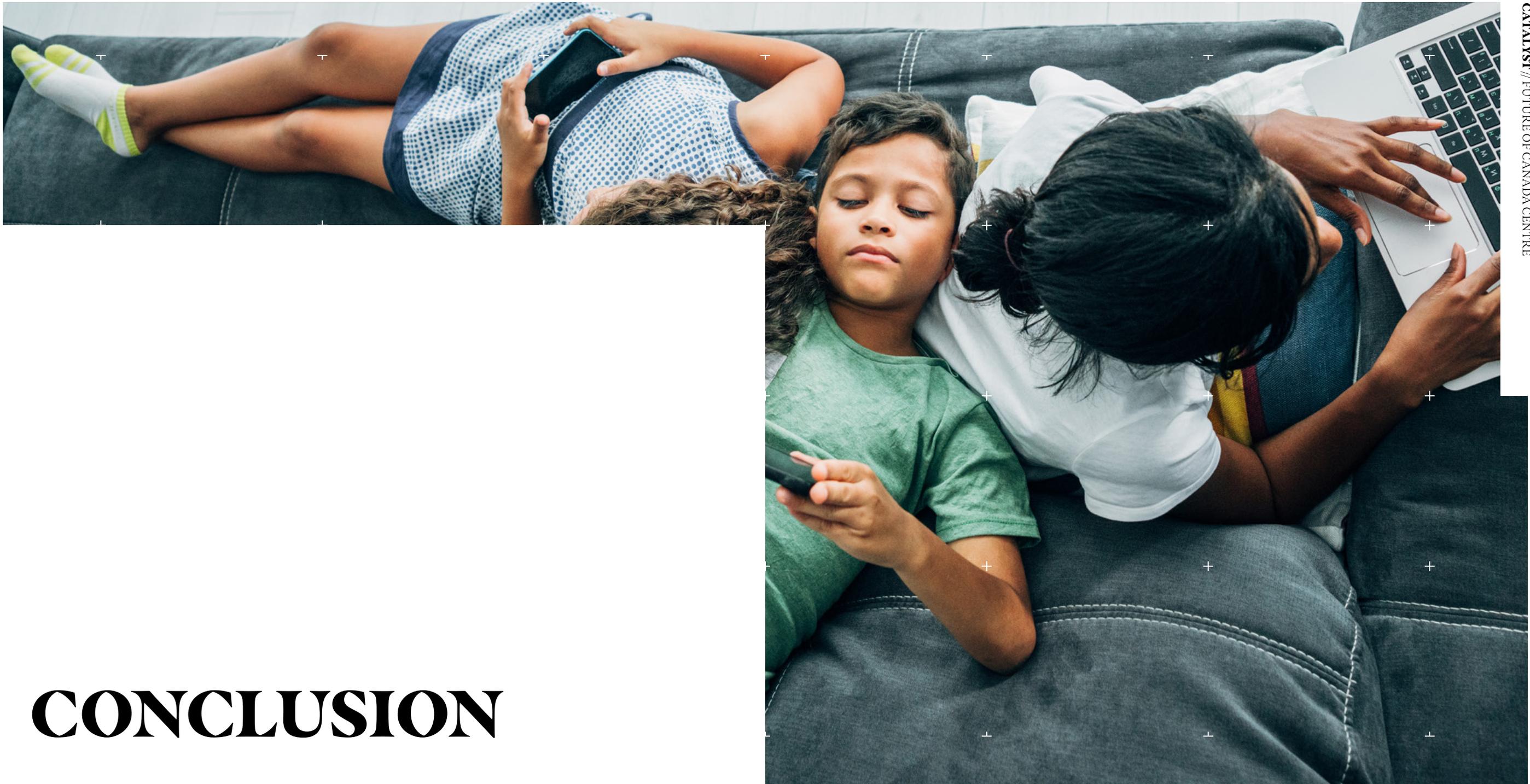
CONCLUSION

Some Canadians can't access the basic online services that are vital for living in the modern world. Even more lack the skills they need to effectively use digital technology, whether that's setting up an email account, spotting false information on social media, or troubleshooting a malfunctioning device. And all face growing threats to our online safety, privacy, and well-being.

Addressing these challenges will require bold action. In many cases, it will require a reshuffling of funding priorities and political will, as well as a fundamental shift in the way that many organizations operate. And while great work on digital equity is happening across the country, we heard time and time again during our research that these efforts are too often fragmented. To make real progress at scale, we need better cooperation between and among governments, businesses, non-profits, and other stakeholders.
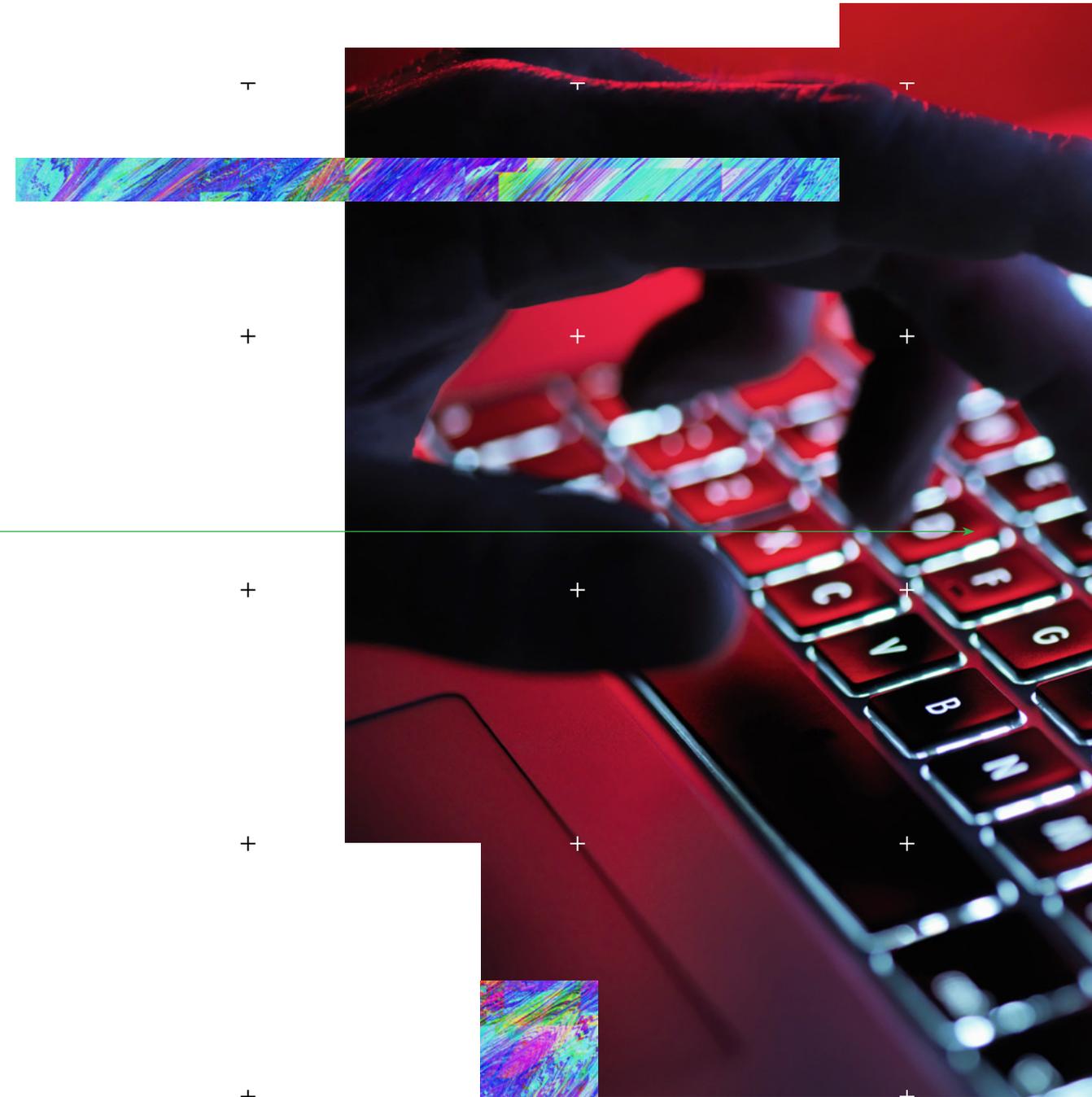
Progress starts with building a digitally equitable future for people—a future where all Canadians have access to the internet and devices, the ability to fully participate online, and an ecosystem in which they can thrive. Our next report will tackle this from a different but equally important angle: how organizations can achieve digital equity.

DATA SUPPLEMENT

DIVING INTO THE NUMBERS: DIGITAL EQUITY VISUALIZED

This supplement provides more information about the results of a pair of surveys that informed the Future of Canada Centre's second report on digital equity, *Digital equity: focusing on every Canadian's digital future.* The objective was to understand the greatest challenges facing Canadians concerning their access to the internet and digital devices, ability to navigate the digital world, and feelings around online privacy.

The responses were collected in late 2021 from two surveys, with an overall sample of 1,914 people each, and were weighted to reflect demographic averages across Canada. They have a margin of error of ±2.24% at a 95% confidence interval.

This supplement provides demographic-specific survey results for gender, age, post-secondary education, income, and self-identified ethnic or national origin. It does not include the full results; additional graphs are reported in *Digital equity: raw data collection*, which is available upon request at *digitalequitydata@deloitte.ca*.
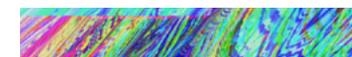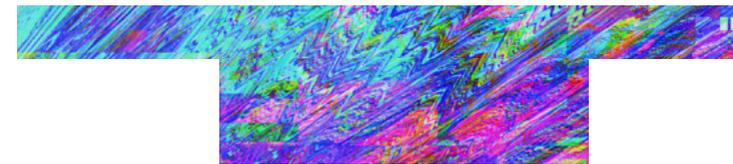
Overview

SUCCESSES

- 95% of Canadians have access to high-speed internet. While rural or remote parts of the country have less coverage compared to urban areas, 90% of respondents in these areas still reported they had full access to high-speed internet.

- About half (58%) of Canadian households are reaching the Canadian Radio-television and Telecommunications Commission (CRTC) targets of 50 Mbps download speeds and 10 Mbps upload speeds.

- About half of Canadians know how to access digital services (51%) and use the internet to connect with people in their geographic or social communities (62%).

- Support for policy and business actions to improve digital equity is generally high, either in the majority or plurality range. Opposition is generally low, ranging from 20% to 30%.

GAPS

- 61% of rural internet users have speeds below CRTC-defined targets. Cost, not availability, is the main barrier.

- People with lower incomes tend to have much slower internet. Broadband inequity is closely related to income levels.

- Frustration with technology tends to grow with age. This could be related to the cognitive changes that come with aging or to a generational pre-internet divide, but regardless, hardware and software may not be adapting to the needs of senior Canadians.

- Indigenous and racialized peoples benefit the most from connecting with others in their communities, but they face higher levels of online discrimination and bullying than other respondents.

DETAILED SURVEY RESULTS

1. *Population-wide results*

2. *By gender*

3. *By age*

4. *By education level*

5. *By household income*

6. *By self-identified ethnicity or national origin*

1. Population-wide results

These figures give insight into the broad digital landscape of Canada. They show the distribution of costs for high-speed internet and the reasons why people might have limited access to home internet or mobile devices. In general, the median Canadian household pays $84 per month for internet service, and rarely more than $100, though there's greater variation among larger household sizes. The population-wide figures also shed light on the digital skills training ecosystem—for instance, who knows how to access training, who feels equipped to navigate the digital economy, and what barriers are limiting access to training resources for whom. In general, the cost of digital training and knowing where to find it have an impact on people's ability to advance their digital skills, while factors such as language barriers have a lesser effect.

1. POPULATION-WIDE RESULTS

Figure 1a: Median cost of monthly internet service (CAD)

Maximum — $150

$100

Median (± 14%) — $86

$65

Minimum — $13

RANGE OF MONTHLY HOUSEHOLD INTERNET PRICES
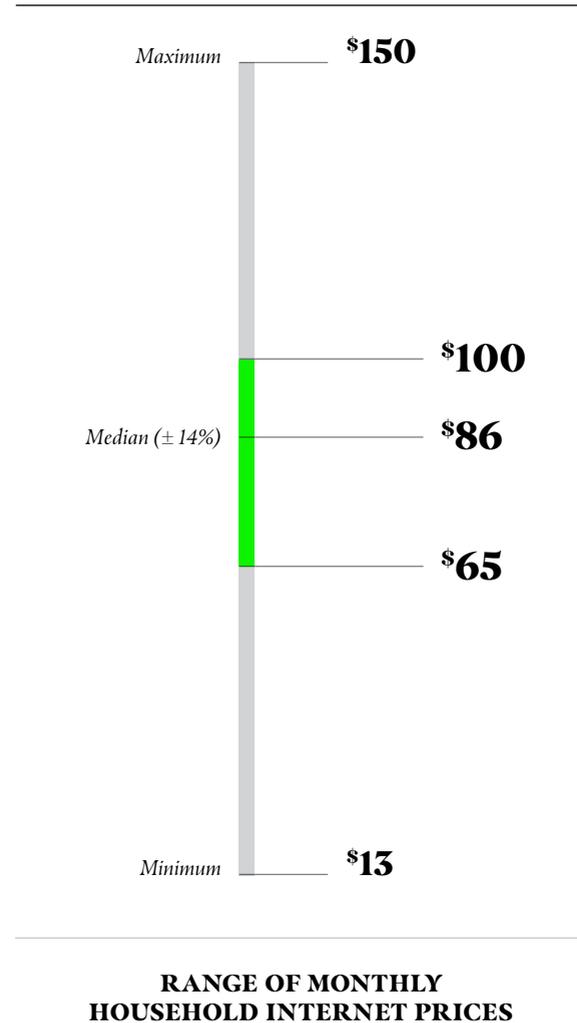
Figure 1b: Reasons for not having a data plan*

Reason	%
Cost of data	68%
No need or interest	30%
Cost of devices	11%
Security concerns	11%
Technical issues or complexity	8%
Limited service area	2%
Other	17%
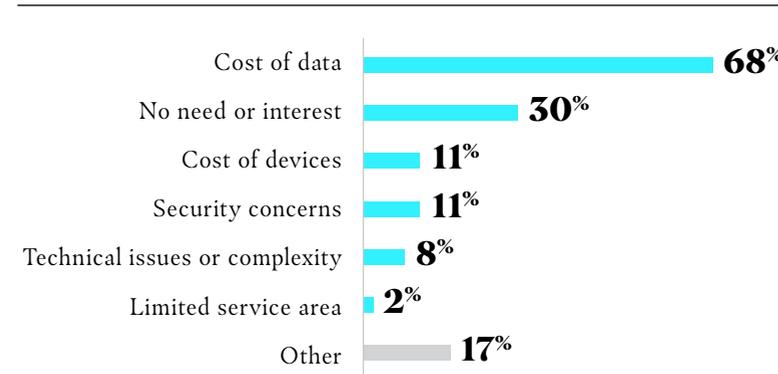
Figure 1c: Reasons home internet access is limited*

Reason	%
Unreliable service	59%
Restrictive data caps	38%
Other	17%
Too many users	11%
Household use limits	1%
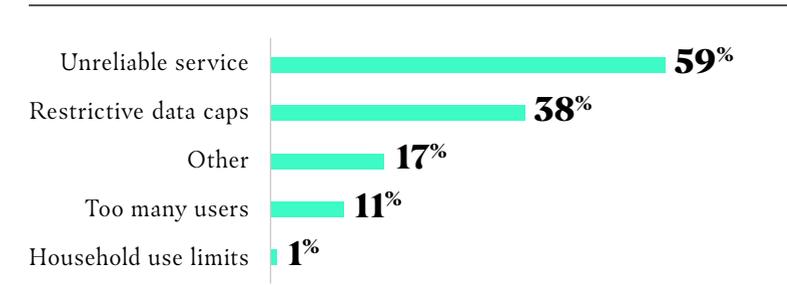
For figures 1b and 1c, the percentages add up above 100% as respondents were able to select multiple options.

Figure 1d: Knowledge of and access to digital skills training

Statement	Disagree	Agree
I have enough digital skills to perform tasks at work	17%	62%
I have developed strong digital skills largely on my own	21%	61%
I know where to look for digital training resources	25%	51%
I am able to access digital training that meets my needs	19%	48%
My education helped me to succeed in a digital economy	39%	37%
I feel self-conscious about gaps in my digital skills	44%	32%
Digital skills training costs too much	21%	31%
I want digital training, but don't know where to find it	40%	30%
Digital training is not available in my language	73%	7%

Legend:
■ Disagree
■ Neither agree/disagree
■ Agree

2. By *gender**

The gendered aspects of digital equity are shown here by who controls access to the internet, who is able to troubleshoot technical problems, and who feels safe engaging with others in digital spaces. Men tend to be the primary payers for online digital access (see *Figure 2a*), feel more adept at solving technical issues than women do (*Figure 2b*), and feel safer expressing themselves on the internet (see *Figure 2c*). Men are also more likely to find it easier to find and pay for digital skills training (*Figures 2d* and *2e*).

Gender is self-identified by survey respondents. We did not receive a representative sample of non-binary, two-spirit, or other forms of gendered/non-gendered self-identification to display here.

2. BY GENDER

Figure 2a: Who pays for data

	Male	Female
Self	57%	43%
Employer	80%	20%
Other household member	40%	60%
Other	63%	37%

Legend: ■ Male ■ Female
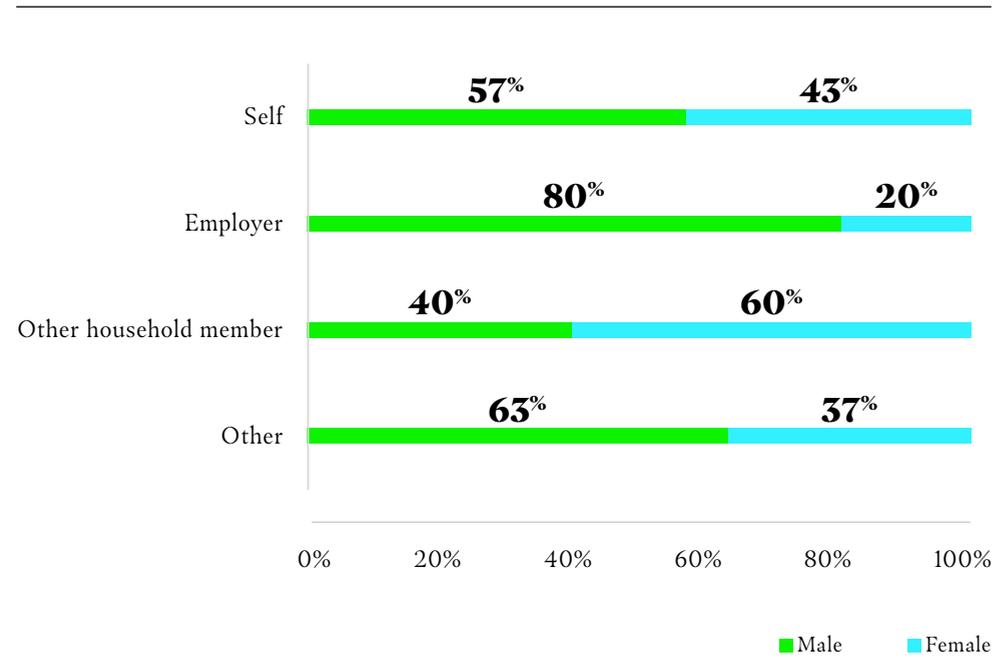
Figure 2b: I am skilled at troubleshooting technical problems

	Disagree	Agree
Female	33%	47%
Male	23%	58%

Legend: ■ Disagree ■ Neither agree/disagree ■ Agree
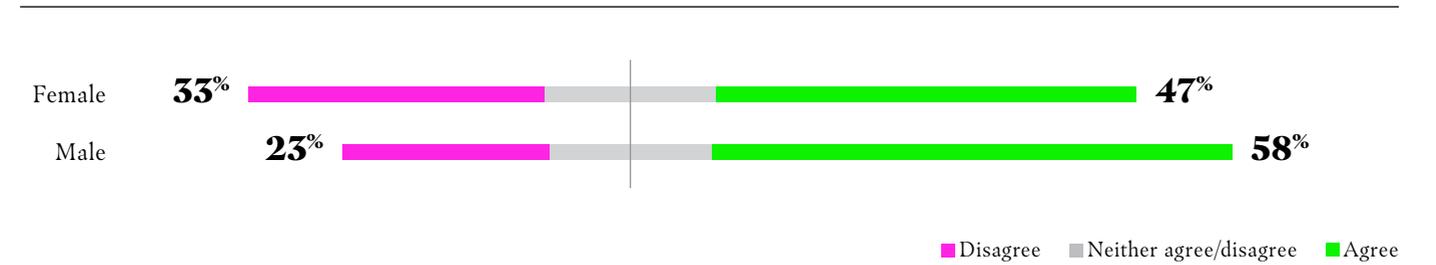
Figure 2c: I feel safe expressing myself and my opinions on the internet

	Disagree	Agree
Female	42%	33%
Male	34%	39%

Legend: ■ Disagree ■ Neither agree/disagree ■ Agree

2. BY GENDER

Figure 2d: I want to improve my digital skills, but don't know where to start

Female	**37%** [====disagree====][neither][====agree====] **32%**	
Male	**44%** [====disagree====][neither][===agree===] **28%**	

■ Disagree ■ Neither agree/disagree ■ Agree
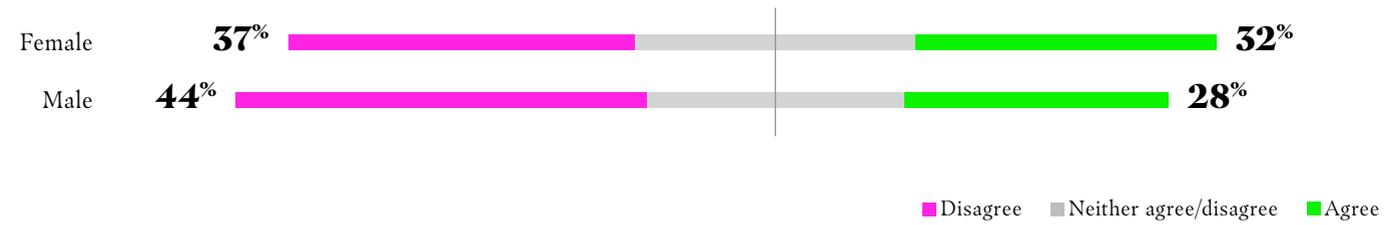
Figure 2e: Digital skills training is prohibitively expensive

Female	**18%** [disagree][neither][====agree====] **35%**	
Male	**24%** [disagree][neither][===agree===] **27%**	

■ Disagree ■ Neither agree/disagree ■ Agree
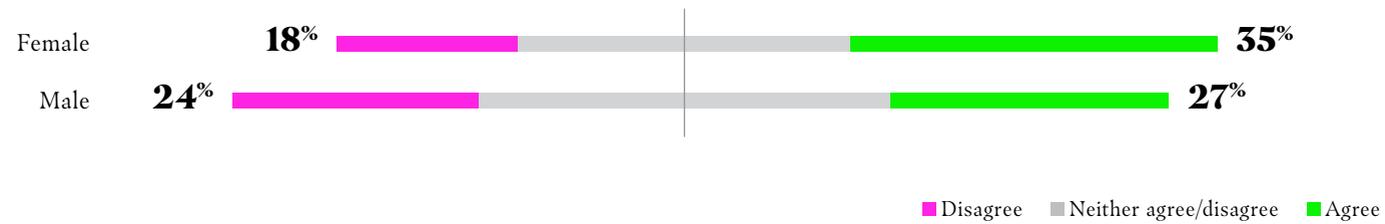
3. By age

Age is one of the major factors driving digital inequity in Canada. Seniors in general are much more likely than younger generations to feel their needs aren't being met by developers (*Figure 3e*). This expresses itself in frustration learning new devices (*Figure 3a*) or troubleshooting technical problems on these devices (*Figure 3b*). Senior Canadians are also less likely (44%) than the national average (60%) to have used digital training services in the past (*Figure 3d*) or to know where to find them (*Figure 3c*). The figures here demonstrate a trend between aging and difficulty navigating specific parts of the digital world, with our survey consistently showing a relationship between age and difficulty in using all types of hardware and software as well as the internet.

3. BY AGE

Figure 3a: I struggle to learn new devices or technologies

AGE OF RESPONDENTS	Disagree	Agree
65+	40%	43%
55–64	47%	32%
45–54	56%	26%
35–44	71%	16%
<35	70%	18%

■ Disagree ■ Neither agree/disagree ■ Agree
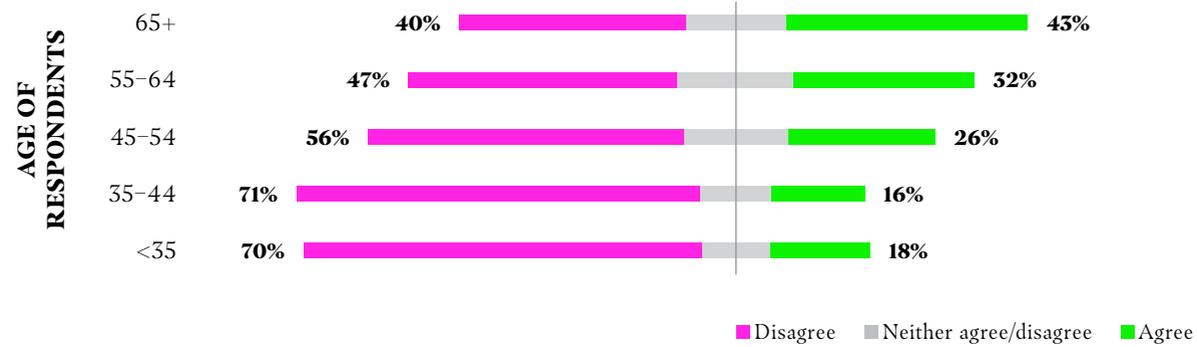
Figure 3b: I am skilled at troubleshooting technical problems

AGE OF RESPONDENTS	Disagree	Agree
65+	46%	30%
55–64	37%	39%
45–54	31%	50%
35–44	18%	65%
<35	15%	71%

■ Disagree ■ Neither agree/disagree ■ Agree
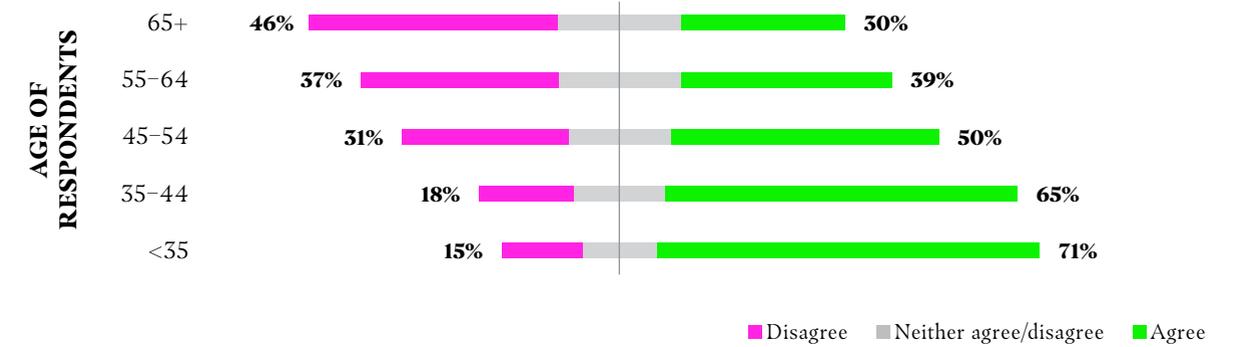
Figure 3c: I know where to look for digital skills training

AGE OF RESPONDENTS	Disagree	Agree
65+	32%	33%
55–64	32%	43%
45–54	27%	52%
35–44	24%	57%
<35	14%	65%

■ Disagree ■ Neither agree/disagree ■ Agree
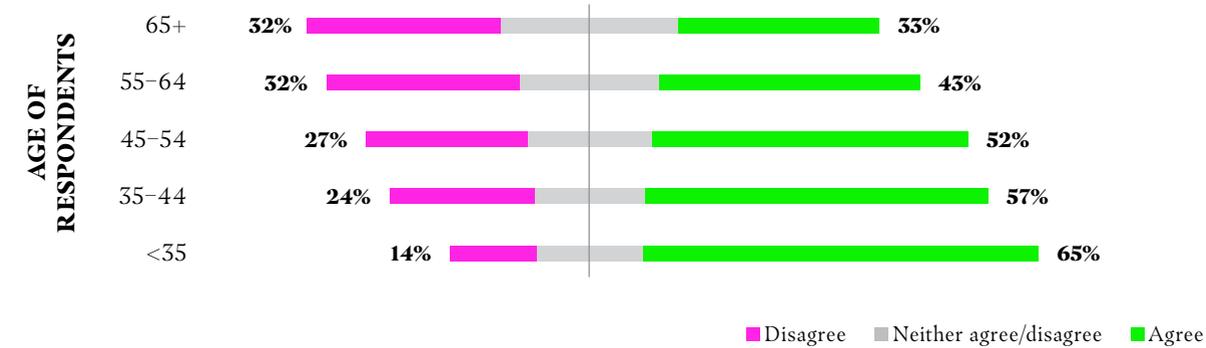
3. BY AGE

Figure 3d: I have used digital skills training; difference vs. national average (60%)

PERCENT ABOVE-BELOW AVG (60%)

- 11%
- 5%
- 3%
- -7%
- -16%

<35   35–44   45–54   55–64   65+

AGE OF RESPONDENTS
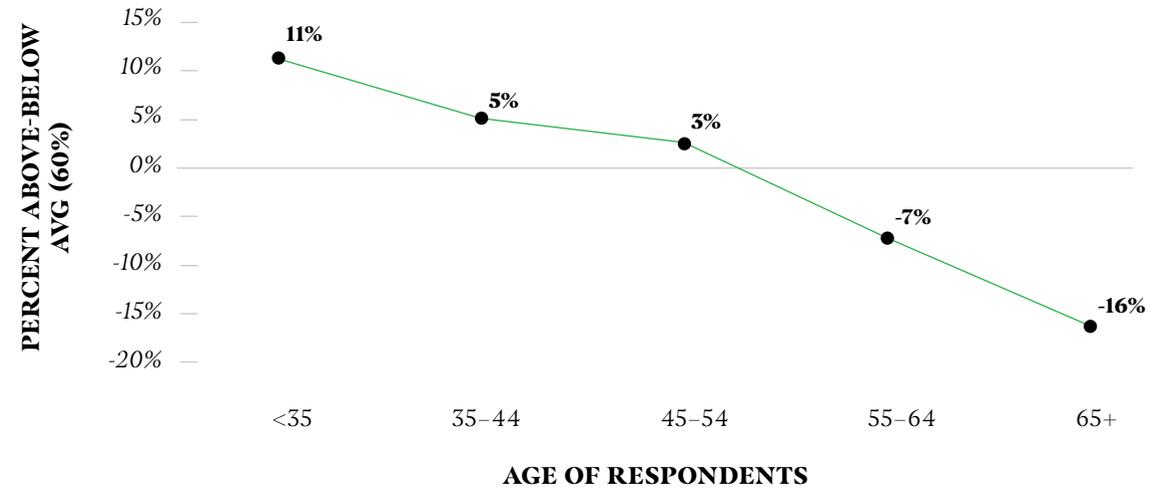
Figure 3e: My needs are considered by the developers of new technologies

AGE OF RESPONDENTS

Age	Disagree	Agree
65+	38%	25%
55–64	37%	20%
45–54	24%	28%
35–44	23%	45%
<35	25%	45%

■ Disagree   ■ Neither agree/disagree   ■ Agree

4. By education level

This section highlights that, for many Canadians, digital skills training is often only accessible to those who already have post-secondary education. For example, over two-thirds of Canadians with a university education have received some digital training in the past, compared to only half of Canadians without a *post-secondary certificate or degree** (*Figure 4a*). Those with university degrees were also more likely to know where to access digital skills training (*Figure 4b*), were more secure in knowing how to find training once they wanted it (*Figure 4c*), and more frequently used digital devices to pursue education or employment-related activities (*Figure 4d*). As a result, those with university degrees felt twice as confident as those without that their digital skills would help them succeed in today's economy (*Figure 4e*). This may have a compounding effect; those with a university or college education may already be in positions that provide them with benefits and opportunities to achieve further training.

*To save space in the following graphs, shorthand is used for university-level education (Univ) and for those with no post-secondary education (No PS)

4. BY EDUCATION LEVEL

Figure 4a: I have previous experience with digital skills training

LEVEL OF EDUCATION

	No	Unsure	Yes, more than 12 months ago	Yes, within the last 12 months
Univ	29%	2%	30%	39%
College	28%	4%	32%	36%
No PS	45%	4%	25%	26%

■ No　■ Unsure　■ Yes, more than 12 months ago　■ Yes, within the last 12 months
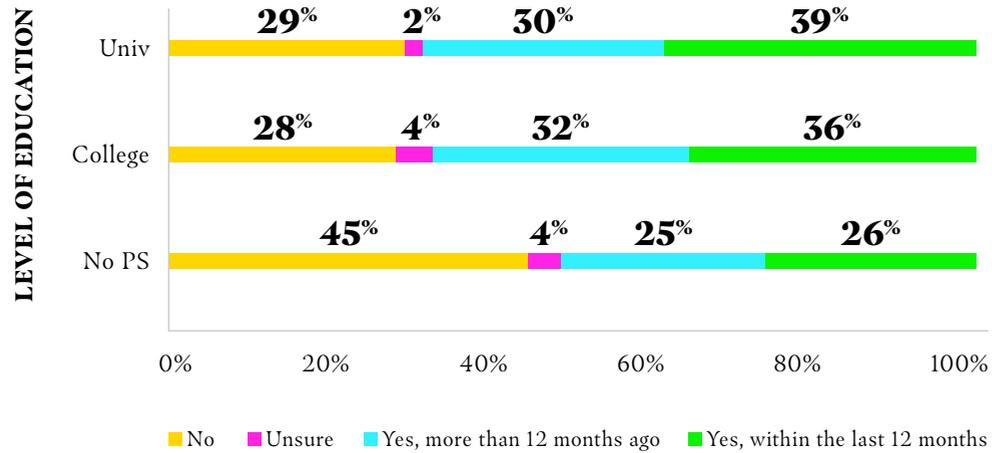
Figure 4b: I know where to look to get digital skills training

LEVEL OF EDUCATION

	Disagree		Agree
Univ	23%		58%
College	24%		51%
No PS	26%		47%

■ Disagree　■ Neither agree/disagree　■ Agree

Figure 4c: I want to improve my digital skills, but don't know where to start

LEVEL OF EDUCATION

	Disagree		Agree
Univ	45%		29%
College	42%		28%
No PS	36%		32%

■ Disagree　■ Neither agree/disagree　■ Agree

4. BY EDUCATION LEVEL

Figure 4d: How often I use the internet to do work or school tasks

	Daily	2 to 5 times a week	About once a week	Less than weekly	Never
Univ	65%	15%	4%	4%	13%
College	50%	14%	7%	8%	20%
No PS	40%	14%	7%	10%	29%

LEVEL OF EDUCATION

■ Daily ■ 2 to 5 times a week ■ About once a week ■ Less than weekly ■ Never
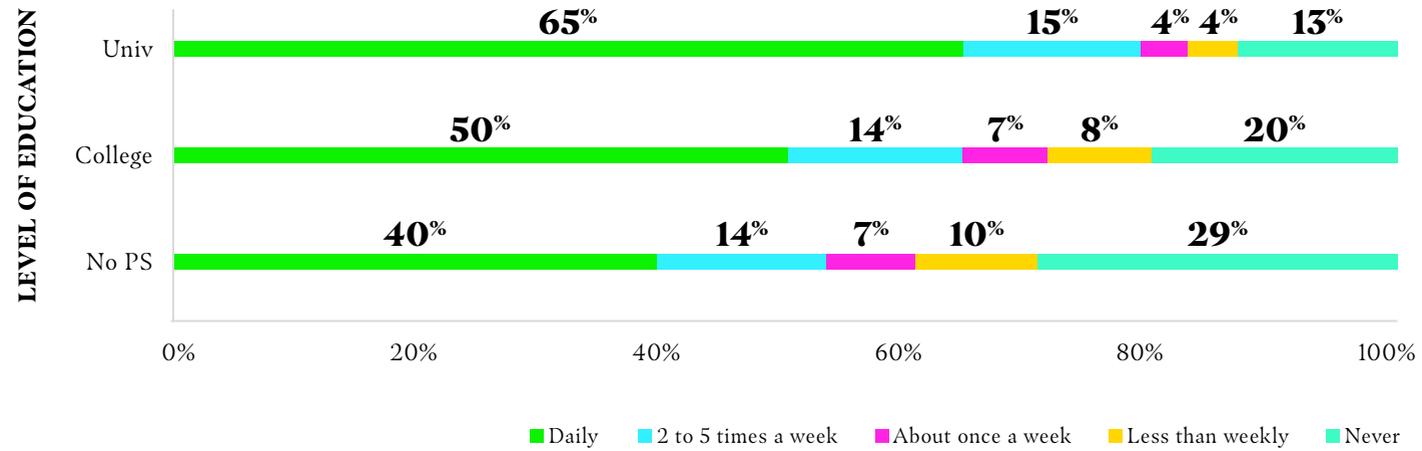
Figure 4e: My education equipped me with sufficient digital skills to succeed in today's economy

	Disagree	Agree
Univ	30%	49%
College	31%	43%
No PS	48%	27%

LEVEL OF EDUCATION

■ Disagree ■ Neither agree/disagree ■ Agree

5. By household income

A look at household income reveals how digital inequity can impact more than just a person's economic or social outcomes—it can also affect their perception of technology and digital services in general. Those at the top of the income scale in our survey (households that earn more than $150,000 a year) were more likely (74%) than those at the bottom (less than $40,000 a year) (49%) to agree that the internet and new technologies have had a positive impact on their life (*Figure 5a*). This may play out in both the quality of internet service and what people are able to use it for.

As outlined in our main report, internet speed is highly correlated with household income. We found that households with lower incomes tend to slide below CRTC thresholds more often compared to higher-income households (*Figure 5b*). A majority of households at the lowest income levels fall below the CRTC target—19% higher than the national average and 28% higher than those in the highest income category. One possible effect of this is suggested by the relatively lower uptake of digital skills training by households with lower incomes (*Figure 5c*), with the high costs for these programs being a major barrier (*Figure 5d*).

Households with lower incomes want to be part of the digital world. They have as much enjoyment working with and setting up new devices or technologies as any other income-level group (see *Figure 5e*). A digitally equitable Canada will help them feel as well as receive the same positive impacts felt by Canadians in other income brackets.

5. BY HOUSEHOLD INCOME

Figure 5a: The internet and new technologies have had a positive effect on my life
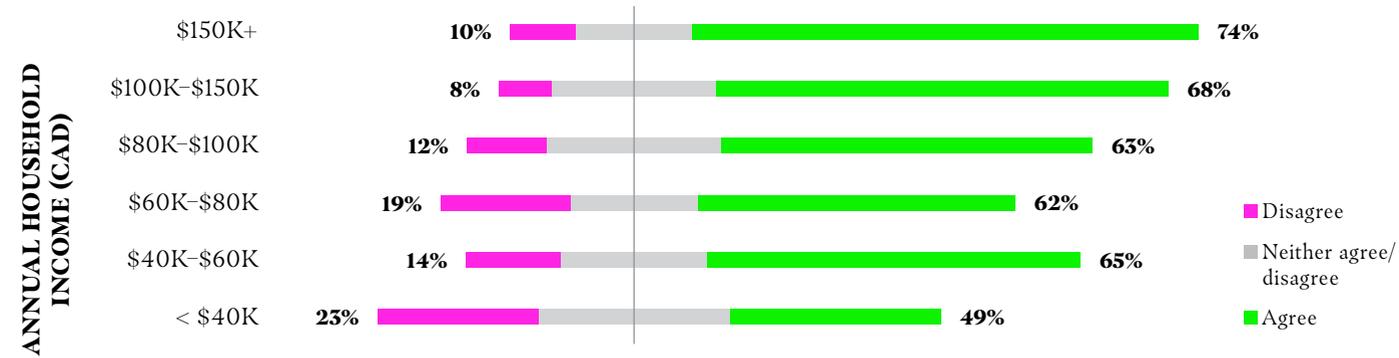
Figure 5b: Internet speed by household income
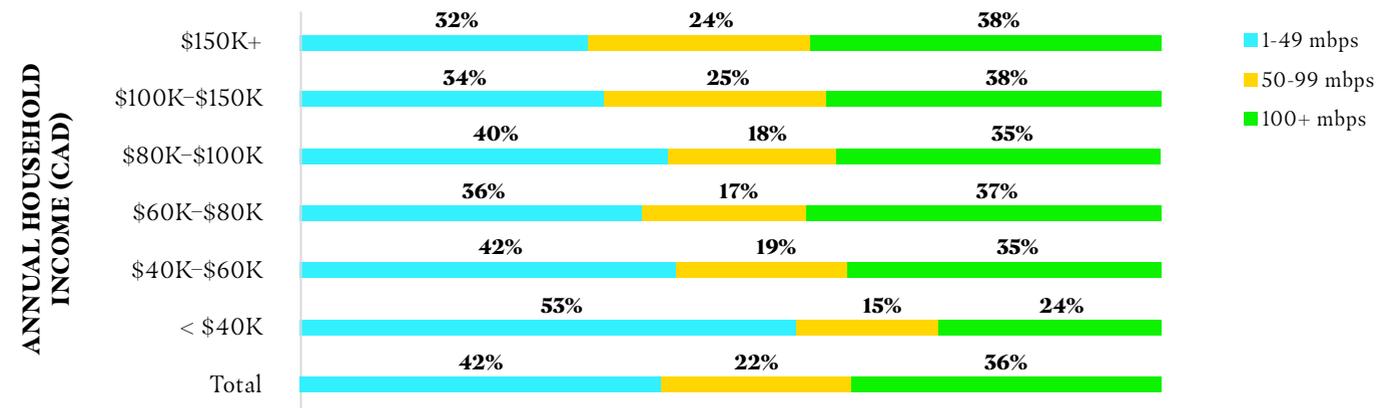
5. BY HOUSEHOLD INCOME

Figure 5c: I have used digital skills training; difference vs. the national average (60%)

PERCENT ABOVE-BELOW AVG (60%)

- <$40K: -14%
- $40K–$60K: -1%
- $60K–$80K: -4%
- $80K–$100K: -5%
- $100K–$150K: 7%
- $150K+: 12%

ANNUAL HOUSEHOLD INCOME (CAD)
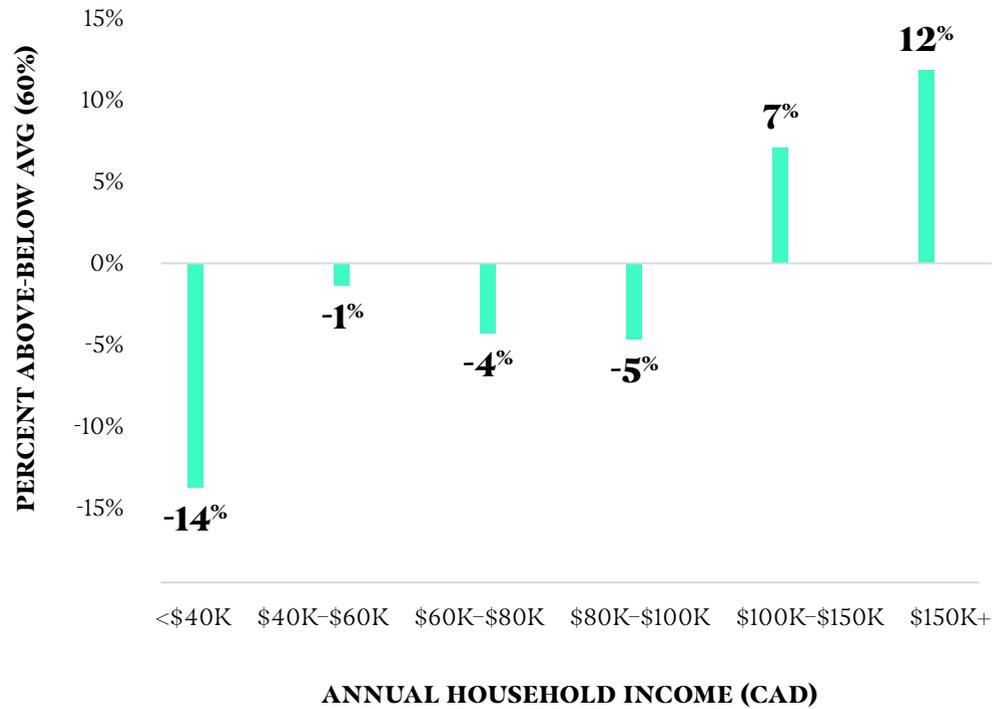
Figure 5d: Digital skills training is prohibitively expensive

ANNUAL HOUSEHOLD INCOME (CAD)

Income	Disagree	Agree
$150K+	35%	23%
$100K–$150K	25%	29%
$80K–$100K	21%	27%
$60K–$80K	18%	30%
$40K–$60K	16%	32%
< $40K	11%	41%
Total	21%	31%

■ Disagree ■ Neither agree/disagree ■ Agree
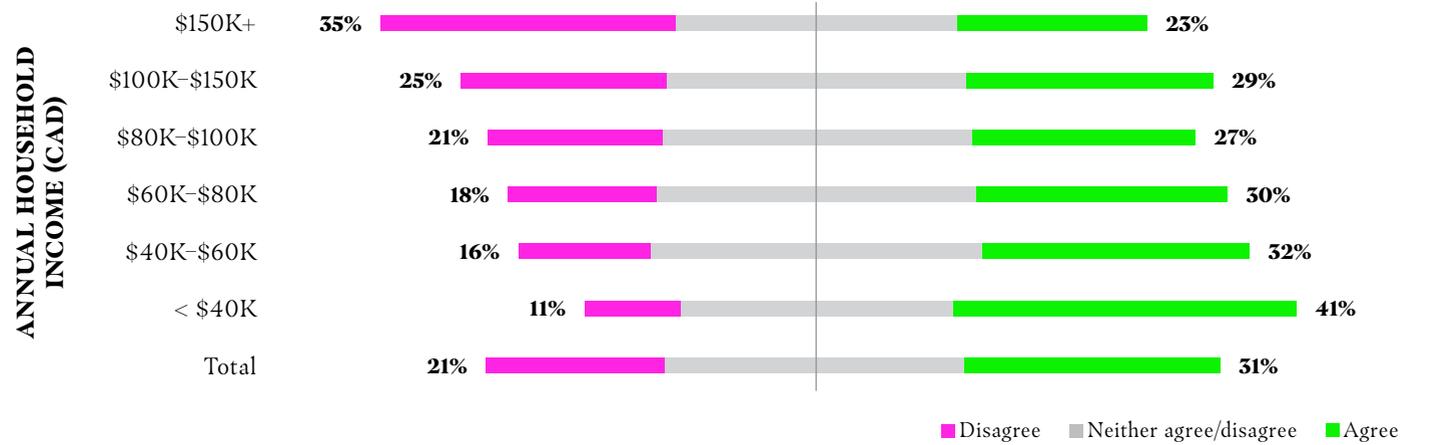
Figure 5e: I enjoy learning new devices or technologies

ANNUAL HOUSEHOLD INCOME (CAD)

Income	Disagree	Agree
$150K+	27%	54%
$100K–$150K	17%	66%
$80K–$100K	24%	53%
$60K–$80K	19%	56%
$40K–$60K	28%	58%
< $40K	25%	58%

■ Disagree ■ Neither agree/disagree ■ Agree

6. By self-identified ethnicity or national origin

An exploration of ethnic or national identity regarding digital equity reveals both positive trends and areas of concern. For Canadians of Asian, African, Middle Eastern, or North African origin—groups in which recent immigrants are heavily represented—the digital world is one without borders, allowing them to find people like themselves and to connect with ethnocultural community groups (*Figures 6a* and *6b*). The same is true for Indigenous peoples in Canada; compared to the national average (47%), Indigenous respondents were more likely (65%) to say they used the internet to find people like themselves. Indigenous respondents were also more likely (80%) to use it for regular connection with community groups, when compared with the national average (50%). Increasing the rate of digital equity is an important aspect of multiculturalism as it enables Canadians from diverse backgrounds to connect, quite literally, with their culture. It is also an act of reconciliation, helping Indigenous individuals build online communities and solidarity.

There is space for improvement, however, as online discrimination and bullying impacts many of these same groups. Over 60% of Indigenous respondents reported experiencing online bullying, with a similar percentage of people of Middle Eastern, Mediterranean, and North African origins reporting likewise (*Figure 6c*). By comparison, the national average stood at 25%, dropping to below 20% for Canadians from white anglophone backgrounds. This is especially troubling not only for the personal impact on those affected by online discrimination, but because those most affected likely represent the future of Canadian digital technology and the digitally enabled economy—Middle Eastern, Mediterranean, African, North African, Asian, and Indigenous respondents were far more likely to report receiving training for and using digital skills in the workplace compared to Canadians from white anglophone or francophone backgrounds (*Figure 6d*). Given the immigration of skilled workers into the Canadian economy and the use of digital technologies in Indigenous communities, action must be taken to address online discrimination and to empower people from immigrant and Indigenous backgrounds to safely navigate the digital world free from bias.

6. BY SELF-IDENTIFIED ETHNICITY OR NATIONAL ORIGIN

Figure 6a: I can find other people like myself on the internet

	Disagree	Agree
Central/Eastern European	19%	35%
French-Canadian	22%	42%
Western European	11%	48%
Prefer not to say	17%	48%
National average	**14%**	**47%**
Mediterranean, Middle Eastern, North African	27%	49%
English-Canadian	20%	50%
United Kingdom	13%	51%
Latin American/Caribbean	17%	53%
Indigenous	11%	65%
Asian	10%	66%
African	17%	68%

■ Disagree   ■ Neither agree/disagree   ■ Agree
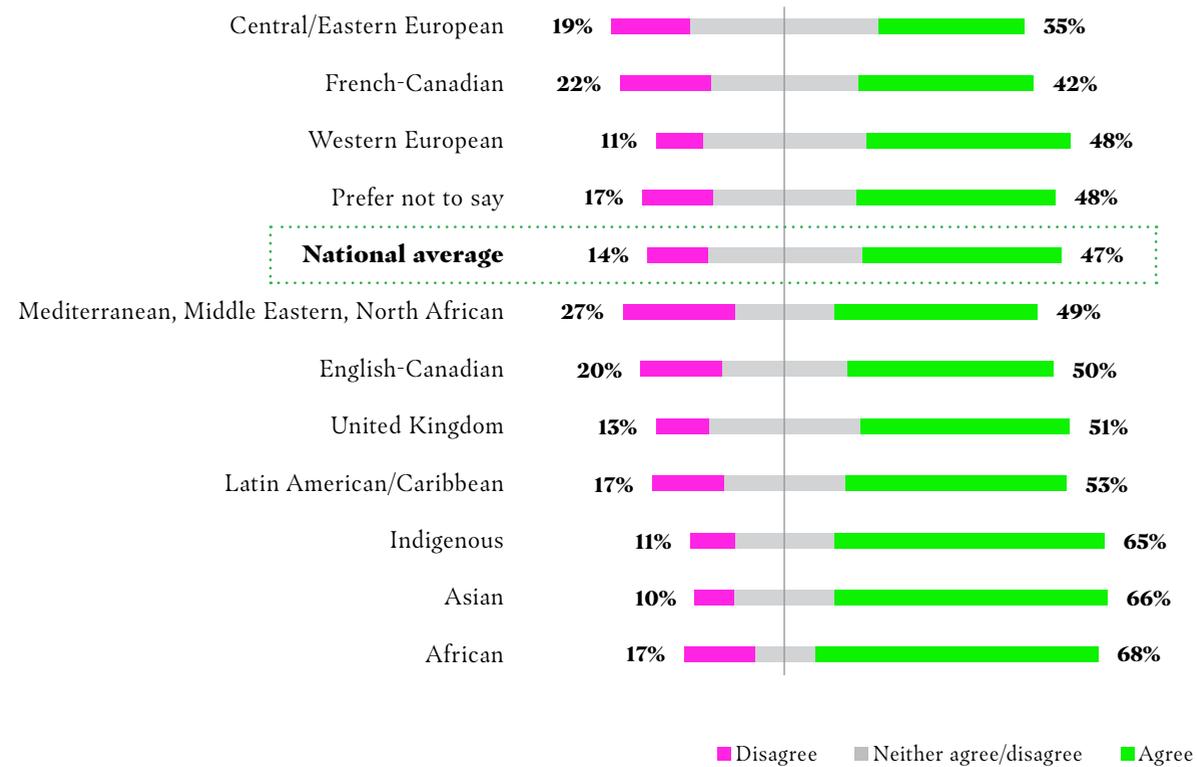
Figure 6b: I regularly use the internet to connect with community groups; difference vs the national average (50%)

	Percent difference
English-Canadian	-13%
Central/Eastern European	-10%
French-Canadian	-5%
Prefer not to say	-2%
Western European	0%
United Kingdom	1%
Mediterranean, Middle Eastern, North African	4%
Asian	16%
African	27%
Latin American/Caribbean	29%
Indigenous	50%

PERCENT DIFFERENCE FROM 50% NATIONAL AVERAGE
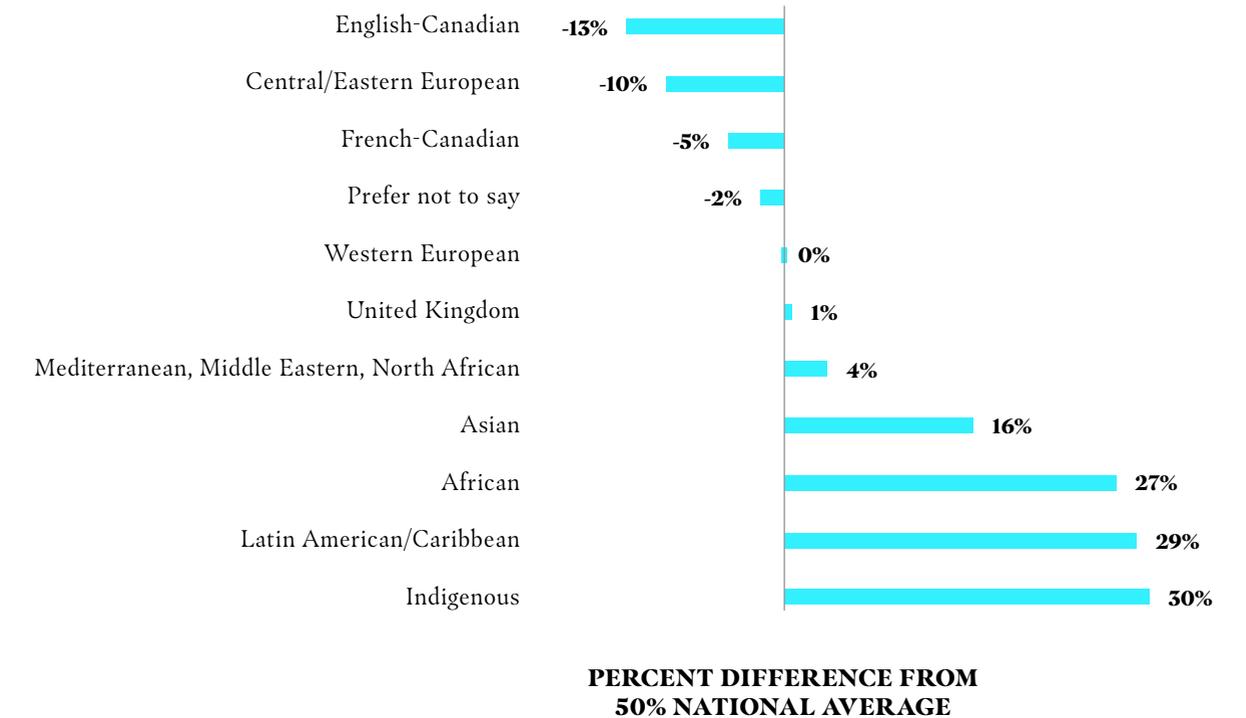
6. BY SELF-IDENTIFIED ETHNICITY OR NATIONAL ORIGIN

Figure 6c: I have been bullied online

	Yes, more than 12 months ago	Yes, within the last 12 months
Prefer not to say	8%	10%
Asian	14%	24%
African	8%	30%
Mediterranean, Middle Eastern, North African	28%	31%
Central/Eastern European	7%	12%
Western European	16%	17%
United Kingdom	12%	17%
Latin American/Caribbean	26%	13%
Indigenous	23%	38%
French-Canadian	16%	21%
English-Canadian	10%	9%
National average	12%	13%
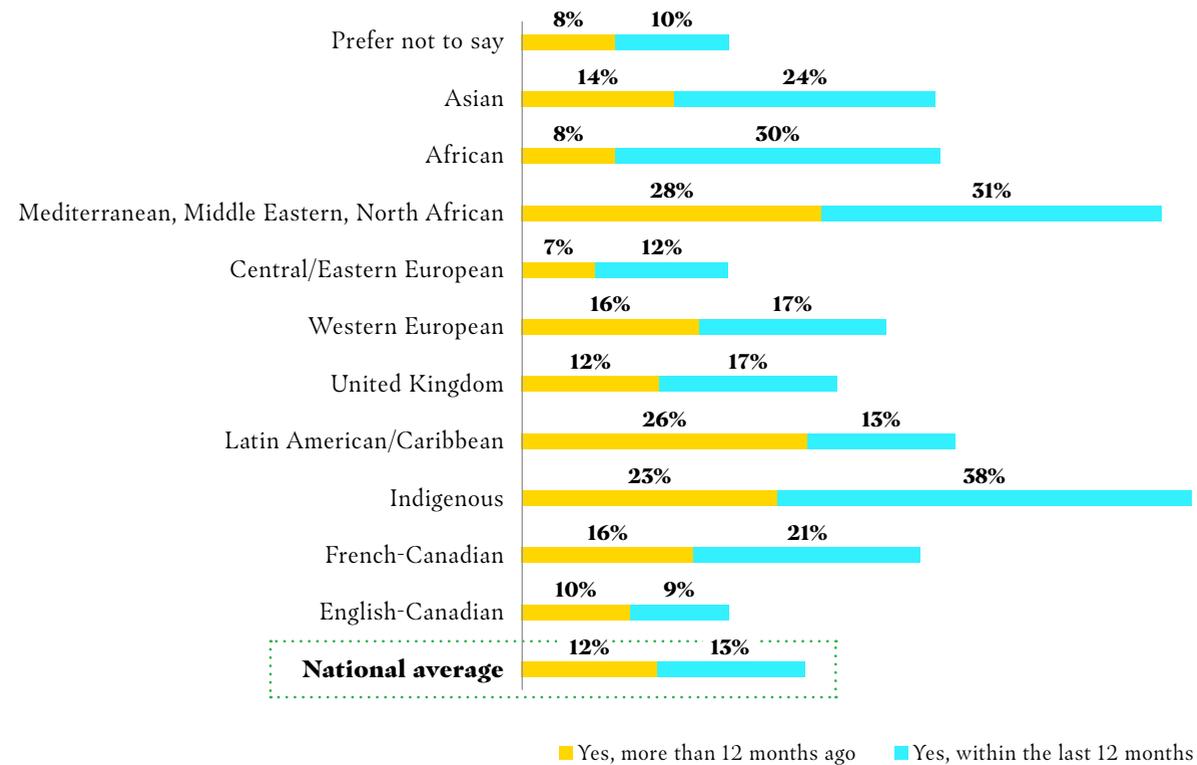
Figure 6d: I have learned sufficient digital skills, either through formal education or workplace training, to adequately perform my job

	Disagree	Agree
Prefer not to say	21%	59%
Asian	11%	76%
African	19%	70%
Mediterranean, Middle Eastern, North African	13%	79%
Central/Eastern European	22%	58%
Western European	13%	65%
United Kingdom	16%	64%
Latin American/Caribbean	12%	75%
Indigenous	11%	70%
French-Canadian	17%	66%
English-Canadian	14%	60%
National average	17%	62%

■ Disagree ■ Neither agree/disagree ■ Agree
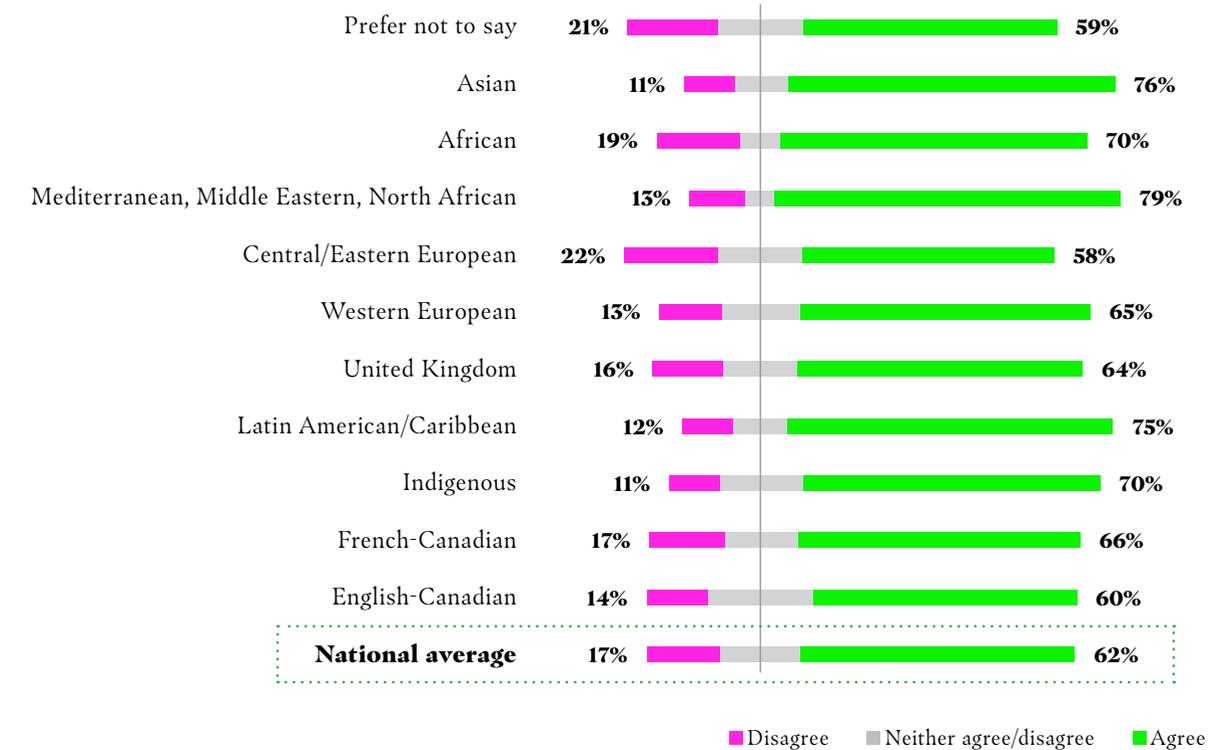
RESOURCES

Progress has been made to improve digital equity, with a range of programs and initiatives having been made available to Canadians in recent years. Many of our recommendations centre on ensuring they can reach more people in need. They include the *resources** listed on this page and the next.

* Note that this should not be read as a complete listing of all resources available in Canada, and that not all of these resources are available nationally or in both official languages. In addition, while we offered a range of organizations the opportunity to include their programs in this list, not all agreed to participate.

Access

Connecting Families (Government of Canada)	A government initiative in partnership with internet service providers to help eligible people get low-cost internet at home
TELUS Internet for Good	Subsidized access to internet services and devices for in-need families, seniors, people living with disabilities, and youth aging out of care
TELUS Mobility for Good	Free smartphones and subsidized data plans for youth transitioning out of foster care, low-income seniors, and Indigenous women at risk or surviving violence
TELUS Smart Hub Library Program	Program that provides TELUS Smart Hubs to libraries across Alberta and British Columbia to loan to library users who may otherwise not have access
reBOOT Canada	Programs to help people and non-profits gain access to the internet and devices
Local public libraries	Many offer programs that provide access to internet and devices

Participation

Goodwill Community Foundation	Online learning to gain beginner digital skills, such as how to use computers or basic professional computer programs (not available in French)
DigitalLearn	Online video courses to gain beginner digital skills (not available in French)
Computer Comfort	Online video courses and tutoring to gain beginner digital skills (not available in French)
DigitalSmarts	Workshop series that teach digital skills, such as job-searching and online banking
Coursera	Online video courses and degrees to gain intermediate or advanced digital skills
LinkedIn Learning	Online video courses to gain intermediate or advanced digital skills
edX	Online university-level courses to gain intermediate or advanced digital skills
Skillshare	Online video courses to gain intermediate or advanced digital skills
TakingITGlobal	Interactive learning experiences to empower young people, and groups working with them, to be involved in their local and global communities
TELUS Tech for Good	Assistive technology, training, and support to enable people living with disabilities to use technologies independently

Ecosystem

MediaSmarts Digital Resources	Online resources to gain digital skills related to privacy, cybersecurity, and digital well-being
Get Cyber Safe (Government of Canada)	National public awareness campaign with resources for everyday cybersecurity
Office of the Privacy Commissioner of Canada	Online resources related to privacy rights and protections in Canada, including how to protect personal information online
TELUS Wise	Digital workshops and resources focused on literacy, online safety, and well-being
Local public libraries	Many offer online and in-person resources to gain online safety skills
Goodwill Community Foundation	Online resources to gain digital skills related to privacy and cybersecurity (not available in French)

Acknowledgements

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