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BIG DATA

Deeper Insights

Why Statistics Canada's drive
to lead the knowledge revolution
will matter to you.

Catalogue no. 11-631-X
ISBN 978-0-660-33757-9

January 2020

Delivering insight through data for a better Canada

Canada



FOREWORD



A century has passed since the Dominion Bureau of Statistics – later renamed Statistics Canada – was created.

Much has changed since 1918. Our country is more diverse, more complex and more data-rich than ever. Technology is evolving at unprecedented speed: 90% of the world's data was produced in the last two years. In today's knowledge economy, having credible information – and knowing how to use it – is vital.

As Canadians' information needs have evolved, so has Statistics Canada – from data provider to data expert. We innovate by providing not only data, but usable and relevant insights, and by integrating new tools, technologies and channels, by increasing our collaboration with clients, stakeholders and partners like you.

As your national statistical agency, we believe that statistics can help shape a better and more prosperous Canada. That is why we will always be committed to providing high-quality statistical information that matters.

The pages ahead are just a sample of what we can offer. Should you want to learn more about what we can do for you, please connect with us. We are at your service.

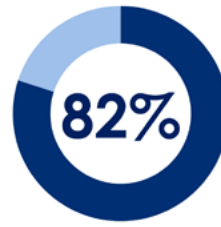
Best regards,

Anil Arora

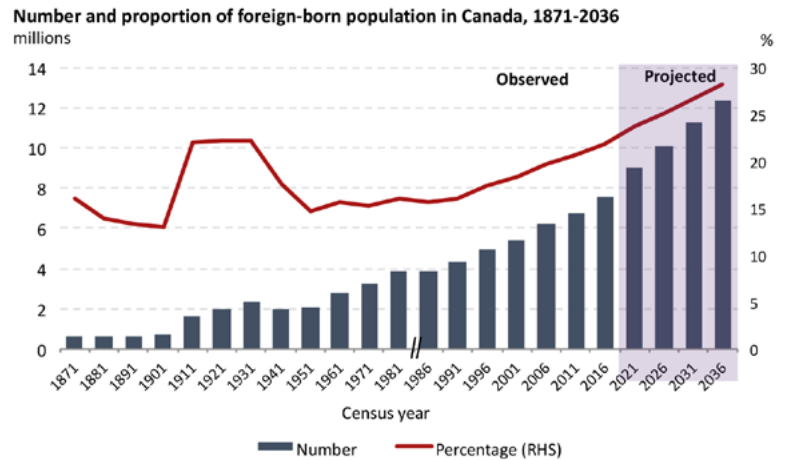
Chief Statistician of Canada

The changing fabric of Canadian society

- Immigration is a main driver of population growth in most provinces.
- Half of all immigrants have at least a bachelor's degree, and over half of those in Canada aged 25 to 64 with a STEM (science, technology, engineering, mathematics and computer sciences) degree are immigrants.
- The employment gap between new immigrants and the Canadian-born population is the smallest it has been in a decade.
- Visible minority populations are expected to continue to increase, particularly in major cities.



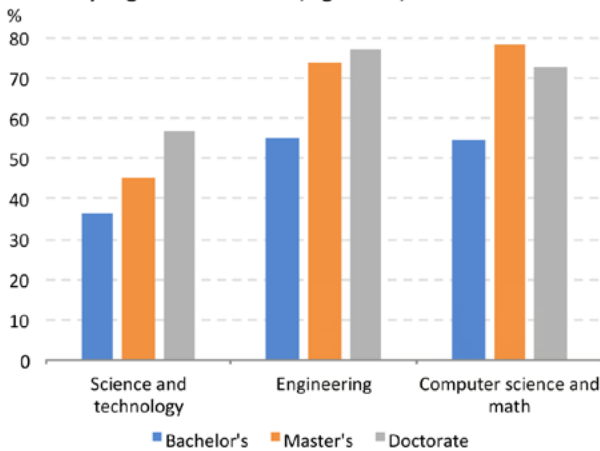
Of population growth in 2018/2019, 82% was attributable to international migratory increase.



Note: // represents a break in the historical series

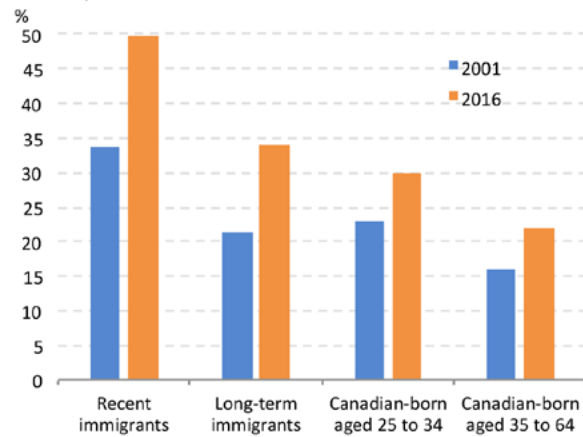
Sources: Statistics Canada, Census of Population, 1871 to 2006, 2016; National Household Survey, 2011; Immigration and Diversity: Population Projections for Canada and its Regions, 2011 to 2036 (reference scenario).

Percent of immigrants among individuals with a university degree in STEM fields, age 25-64, 2016



- In 2016, immigrants accounted for 54% of individuals aged 25-64 with a university degree in a STEM field
- Close to 75% are at the graduate level in engineering, computer science and mathematics
- 2/3 of adult immigrants with a doctoral degree in STEM fields received education in Canada, the US, UK and France

Percent of population with a university degree, Canada, 2001 and 2016

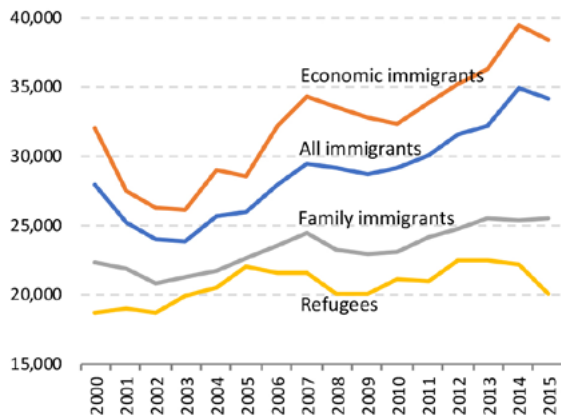


- 50% of recent immigrants aged 25-64 had at least a bachelor's degree in 2016, compared with 30% among Canadian-born youth aged 25-34
- From 2001 to 2016, the number of individuals aged 25-64 with a university degree increased 66% in Canada, one-half came from immigrants

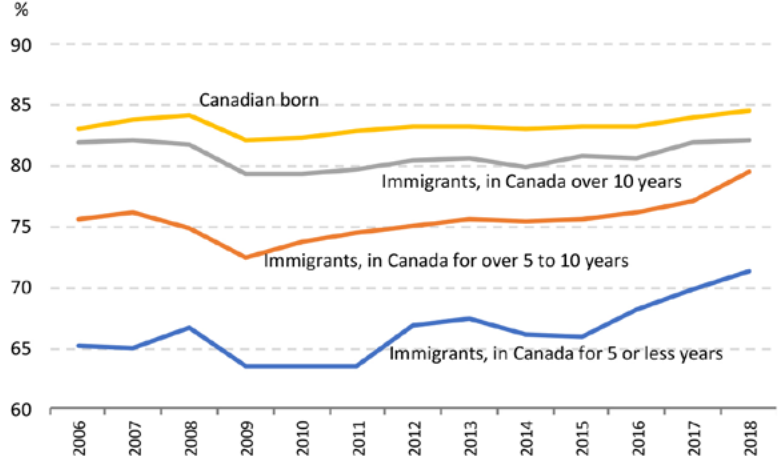
The decreasing employment gap

- First-full year earnings among economic immigrants rose 19% between 2010 and 2015 entry cohorts, which drove the trend for all new immigrants.
- Earnings growth slower among family immigrants at 10%.
- New immigrants experience faster growth in employment rate than the Canadian born – 7.7 ppts increase from 2010 to 2018, compared with 2.1 ppts increase for Canadians
- The employment rate gap between new immigrants and Canadians decreased from 19 ppts in 2010 to 13 ppts in 2018

First full-year earnings of new immigrants aged 20 to 54 at landing by landing year and class, 2000 to 2015 (2016 dollars)



Employment rate for immigrants and Canadian born aged 25 to 54, Canada, 2006 to 2018



The increasing visible minority population

By 2036,

- 26% to 31% of the population is expected to have a mother tongue other than English or French
- 13% to 16% of the population is expected to have a non-Christian religion
- 35% to 40% of the population aged 15 to 64 is expected to belong to a visible minority group



Source: Statistics Canada, 2017, Immigration and Diversity: Population Projections for Canada and its Regions, 2011 to 2036, Statistics Canada Catalogue no. 91-551. Source: Statistics Canada, 2017, Immigration and Diversity: Population Projections for Canada and its Regions, 2011 to 2036, Statistics Canada Catalogue no. 91-551.

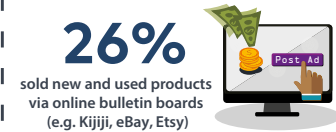
The digital economy is changing the way Canadians interact

- Nominal GDP associated with digital economic activities in Canada: \$109.7 billion (5.5% of the total economy).
- In comparison, activities in the retail and oil and gas extraction sectors were 5% and 4.8% respectively.
- From 2010 to 2017, the nominal GDP of digital activities grew 40.2%. This compares with 28% for the rest of the economy
- 886,114 jobs associated with digital economic activities.

A glimpse at Canadians' digital use or purchases of digital products



Percentage of Canadians who used online bulletin boards to sell products



Average income earned from selling products via online bulletin boards



What was the average amount spent on digital products?



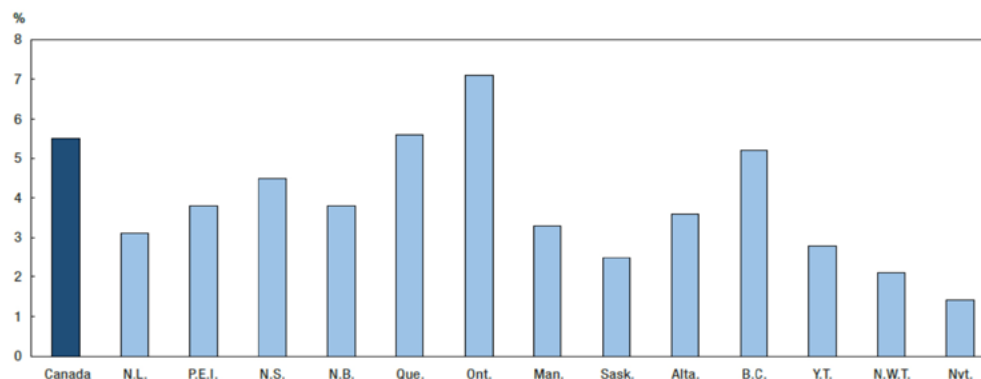
Source: Digital Economy Survey, July 2017 to June 2018.

Digitization of the economy - Potential impacts for businesses and workers

Statistics Canada is a world leader in measuring the value of data to the Canadian economy. We work in partnership with national and international organizations to develop new and enhanced measures of digital economic activity, including recent estimates of the value of investments in data in different areas of the economy.

- Emerging technologies are changing the way businesses operate and, as a result, are changing the nature of work.
- Robots and artificial intelligence are changing the modes of production and skills required for the future.
- The majority of gig workers are young and looking primarily to supplement their income.
- Canada's economy continues to adjust to lower oil prices and global uncertainty.
- Labour market conditions in Canada have remained strong.

Digital economy gross domestic product (GDP) as a proportion of the total economy, by province and territory, 2017



Note: The initial estimates of the digital economy presented in this paper are only available in nominal basic prices. In order to compare the digital economy to the total economy, GDP in nominal market prices was adjusted for taxes less subsidies on products and imports. This adjustment provides an approximate estimate of GDP in nominal basic prices.

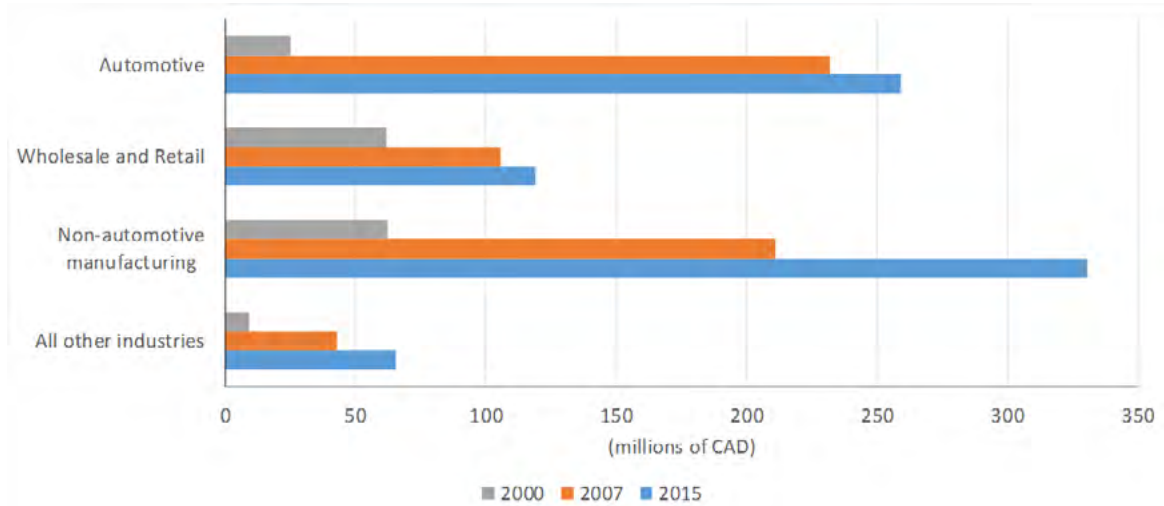
Source: Statistics Canada. 2018. Results from the Digital Economy Survey. Infographics. Catalogue number 11-627-M. Ottawa: Statistics Canada; and Statistics Canada. 2019.

Measuring digital economic activities in Canada: initial estimates. Latest Developments in the Canadian Economic Accounts. Catalogue number 13-605-X. Ottawa: Statistics Canada.

Robots and artificial intelligence are changing the modes of production and skills required for the future

- There was considerable growth in the non-automotive robot stock, which is reflected in the data on the import of robots by Canadian firms.
- Significant investments in automation were made in the non-automotive manufacturing (particularly machinery, chemicals and metals), and wholesale and retail industries.
- Robotics are associated with gains in employment and productivity, but also with higher employee turnover.
- Robots increase the multifactor productivity and employment of adopting firms.
- Productivity gains from the use of robots are associated with organizational changes and fewer managers, but also with more production staff with different skills.

Robot investment by economic sector, 2000 to 2015



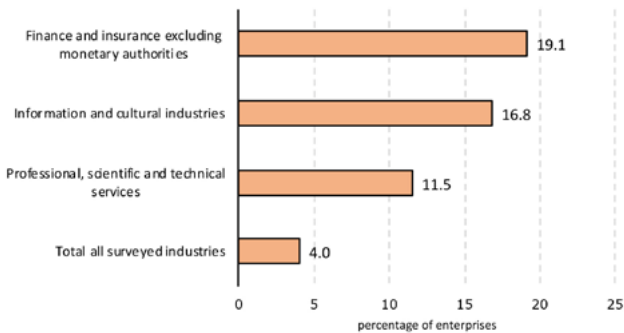
Source: Dixon, J et al. Forthcoming. The Employment Consequences of Robots: Firm-level Evidence. Analytical Studies Branch Research Paper, Statistics Canada.

New technologies are changing the nature of work

“Artificial intelligence (AI) enables machines or the in-built software to behave like human beings which allows these devices to perceive, analyze data, reason, talk, make decisions and act.”

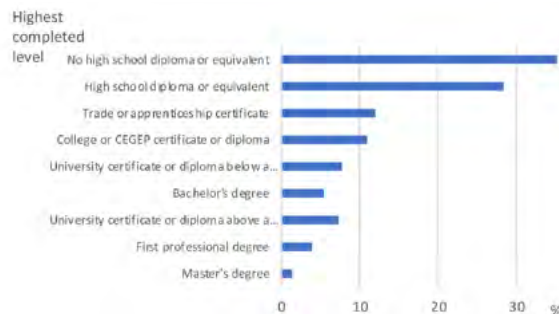
– The Information and Communications Technology Council.

Predicted share facing a high risk of job transformation due to automation by highest level of education



Source: Statistics Canada, table 27-10-0367-01.

Predicted share facing a high risk of job transformation due to automation by highest level of education



Source: Longitudinal and International Study of Adults (LISA), Wave 3 (2016).

Jobs at risk of automation

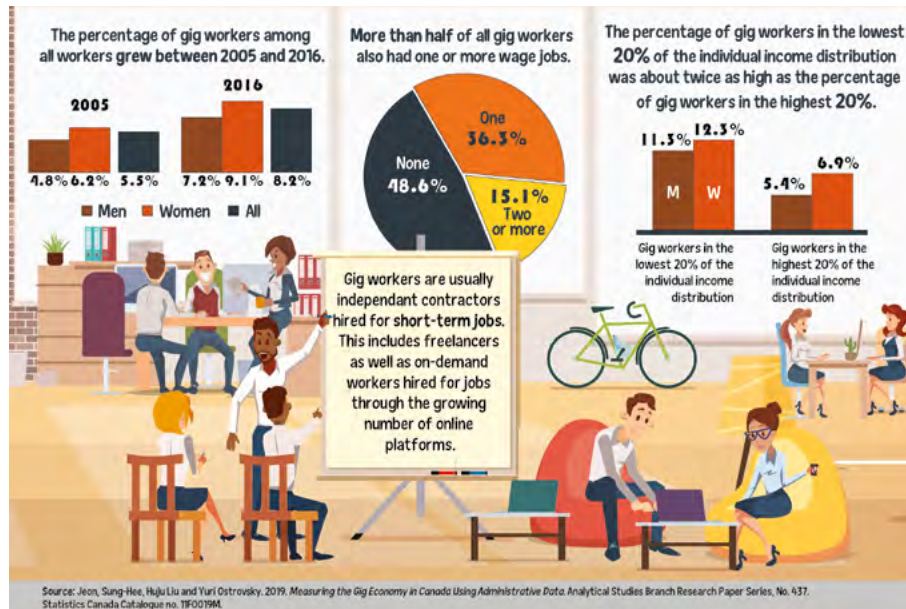


Jobs at risk of significant change



Source: OECD. 2019. The Future of Work. How does Canada compare? OECD Employment Outlook 2019. Paris: OECD, Statistics Canada. 2019. Measuring investment in data, databases and data science: Conceptual framework. Latest Developments in the Canadian Economic Accounts. Statistics Canada catalogue number 13-605-X. Ottawa: Statistics Canada and Innovation and Communications Technology Council. 2015. Artificial Intelligence in Canada Where Do We Stand? Ottawa: Innovation and Communications Technology Council.

The gig economy



The majority of gig workers are young and looking primarily to supplement their income.

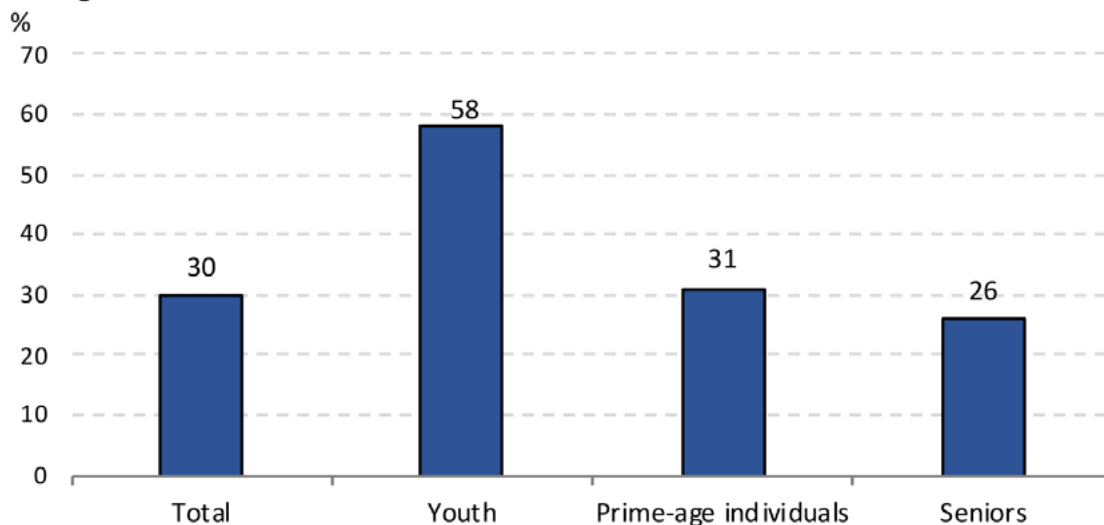
Reasons for informal work:

- Approximately 80% of gig workers do it to earn money.
- 25% of gig workers do it as their primary source of income (mostly youth).

Characteristics of gig workers:

- 58% of youth reported working in the gig economy.
- Part-time workers participate more in the gig economy.

Share of respondents who participate in informal activities, by age group, average 2018Q2-2018Q4



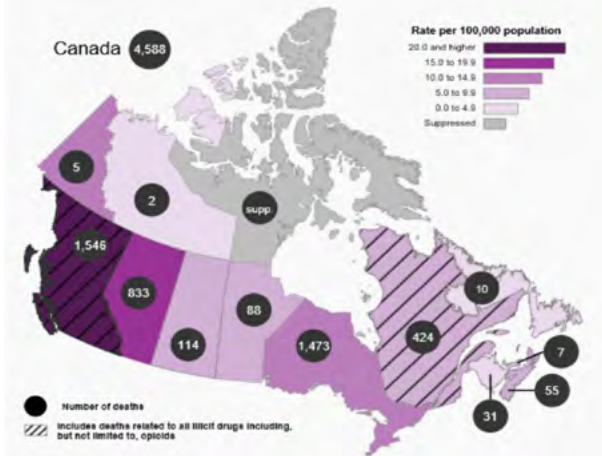
Source: Kostyshyna, O. and C. Luu. 2019. The Size and Characteristics of Informal ("Gig") Work in Canada. Bank of Canada Staff Analytical Note. Ottawa: Bank of Canada, Bank of Canada's Canadian Survey of Consumer Expectations, Bank of Canada calculations.

The Opioid Crisis

- For the first time in over four decades, life expectancy did not increase between 2016 and 2017, primarily because of accidental drug poisonings.
- More than 1 in 10 Canadians aged 15 and older reported having used opioid pain relievers in the previous 12 months.

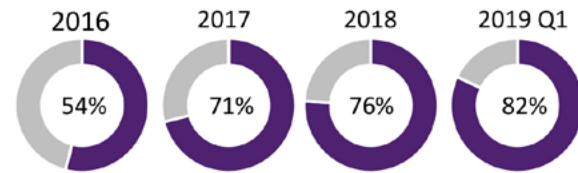
Working collaboratively with stakeholders at the federal, provincial and municipal levels, Statistics Canada is using innovative methods to leverage existing administrative data, as well as creating new sources of data to deliver greater insights on this critical issue.

Apparent opioid-related deaths, 2018



More than **12,800** lives were lost from January 2016 to March 2019 – most were accidental and occurred among males

Percent of accidental apparent opioid-related deaths involving fentanyl or fentanyl analogues

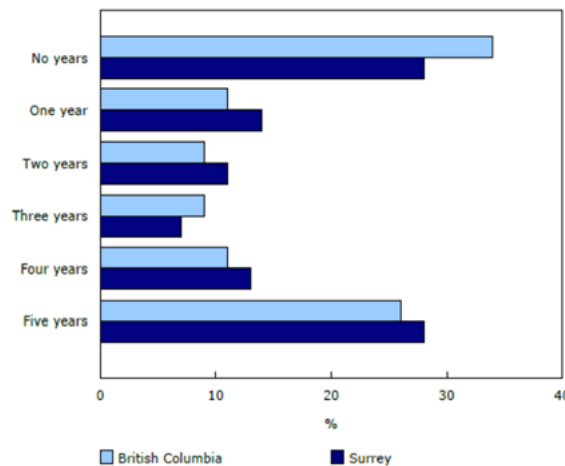


Source: National Report: Apparent Opioid-related Deaths in Canada (Sept 2019). <https://health-infobase.canada.ca/datalab/national-surveillance-opioid-mortality.html#fentanyl>

Not all of those who experience opioid overdoses are alike—understanding these differences can help inform policies and programs

- Of those who died of an opioid overdose in British Columbia, 34% had no employment in the previous five years, while over 25% were consistently employed for all five years.
- Approximately one in five overdose decedents in British Columbia worked in the construction sector in the years prior to their deaths – one in four among those less than 35 years of age.
- Of Canadians aged 15 years and older (11.8 million people), 40.5% reported they had used this type of pain relief product in their lifetime.

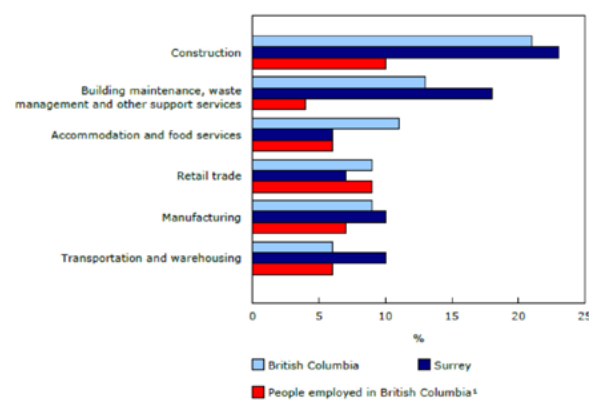
The number of years employed in the five years prior to death, British Columbia and Surrey, 2011 to 2016



Note: Only those years where employment income was above \$500 are counted as years with employment.

Sources: BC Coroners Service data, 2011 to 2016; Statistics Canada, T4 data, 2006 to 2015.

Industry of last main job in the five years prior to death, British Columbia and Surrey, 2011 to 2016



1. People aged 25 to 54 employed in British Columbia as of June 2016.

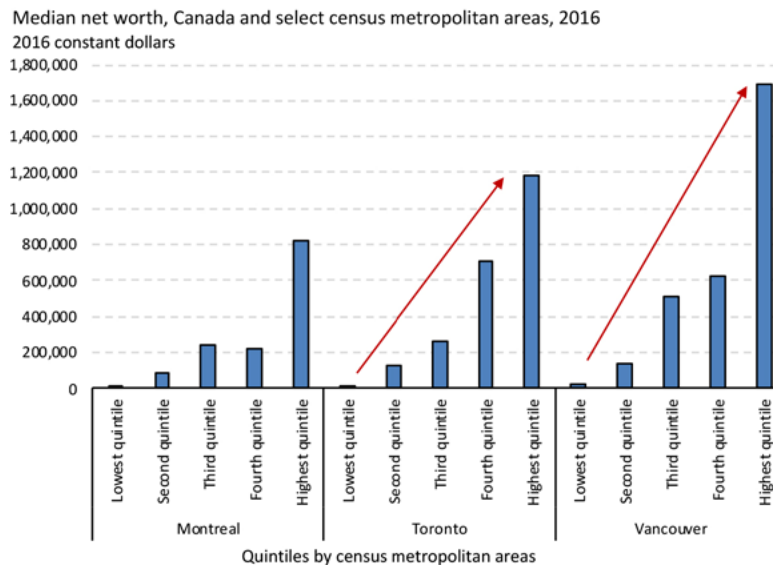
Sources: BC Coroners Service data, 2011 to 2016; Statistics Canada, T4 data, 2006 to 2015.

Housing

The issue of affordability of homeownership continues to be front and centre for many families, as increases in the costs of living and the strain these place on pocketbooks has emerged as a major source of stress for Canadian families. To obtain a full picture of the impacts of changes in living costs on Canadian families, we need to look beyond conventional measures.

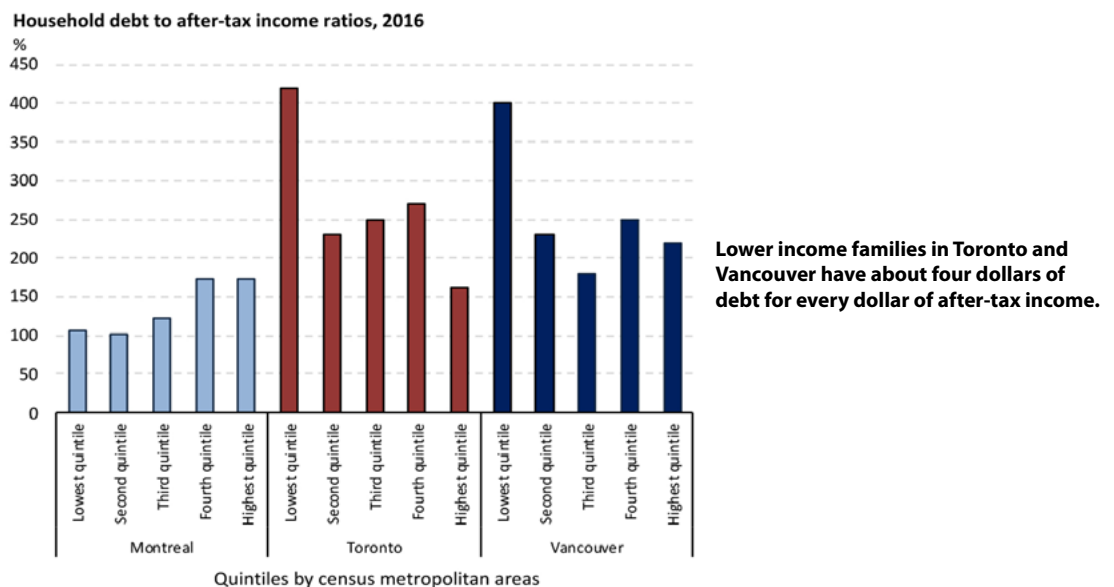
- About 1 in 10 Canadian families with debt shows signs of financial distress, such as skipping or delaying a non-mortgage payment during a 12-month period.
- A total of 8% of Canadian families have less than \$500 in net worth.
- Basic shelter-related living expenditures have risen more rapidly in certain areas of the country, outpacing earnings growth (e.g., in Ontario). Increases in shelter costs have been far more modest in other areas (e.g., in Quebec).
- Household savings and the share of household income spent on food, shelter and transportation vary substantially within the household sector and reflect differences in income level, family type and household age.
- Savings are concentrated among higher-earning households. Most low-to-middle income families have negative savings rates.

Household wealth differs substantially across major urban areas because of differences in homeownership rates and housing values



Source: Statistics Canada, table 11-10-0057-01.

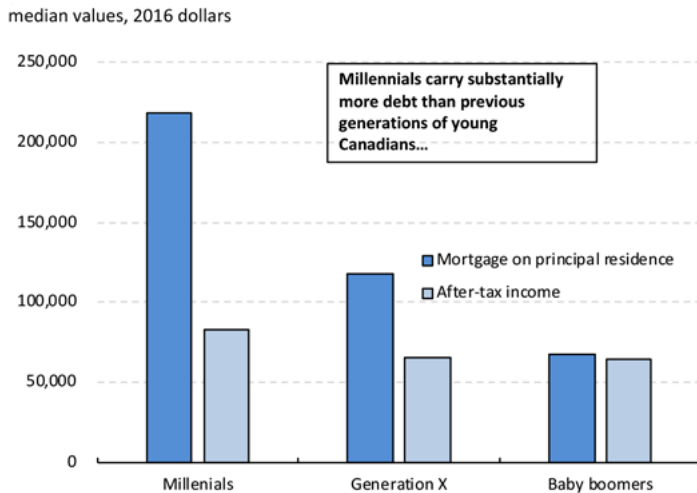
Lower-income families, especially in Toronto and Vancouver, are more vulnerable to potential financial shocks



Source: Special tabulations, Survey of Financial Security, 2016.

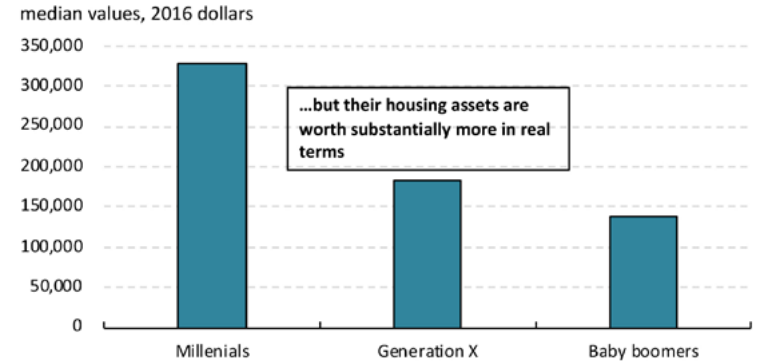
Housing values are the main driver of higher wealth and debt levels among millennials aged 30 to 34

Mortgage debt and after-tax income, persons aged 30 to 34, with a mortgage, by generation



Source: Survey of Financial Security, 1984, 1999 and 2016.

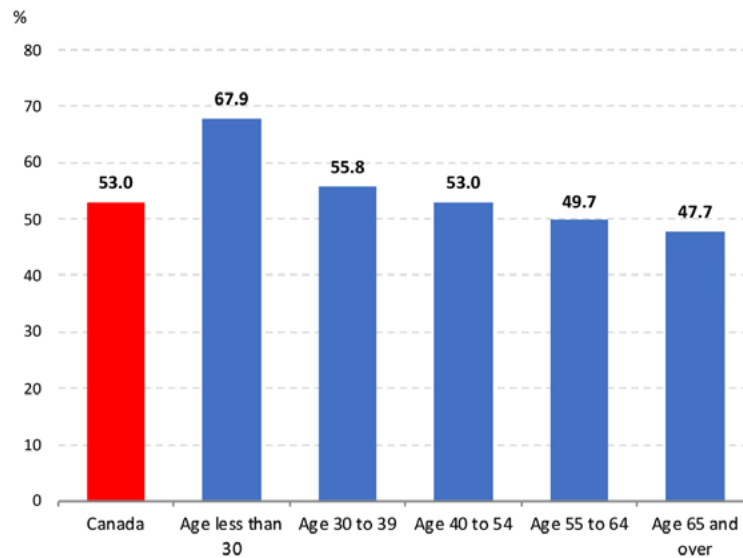
Principal residence values, persons aged 30 to 34, with a mortgage, by generation



Source: Survey of Financial Security, 1984, 1999 and 2016.

There are fewer average differences in savings and living expenditures among households in their prime income-earning years

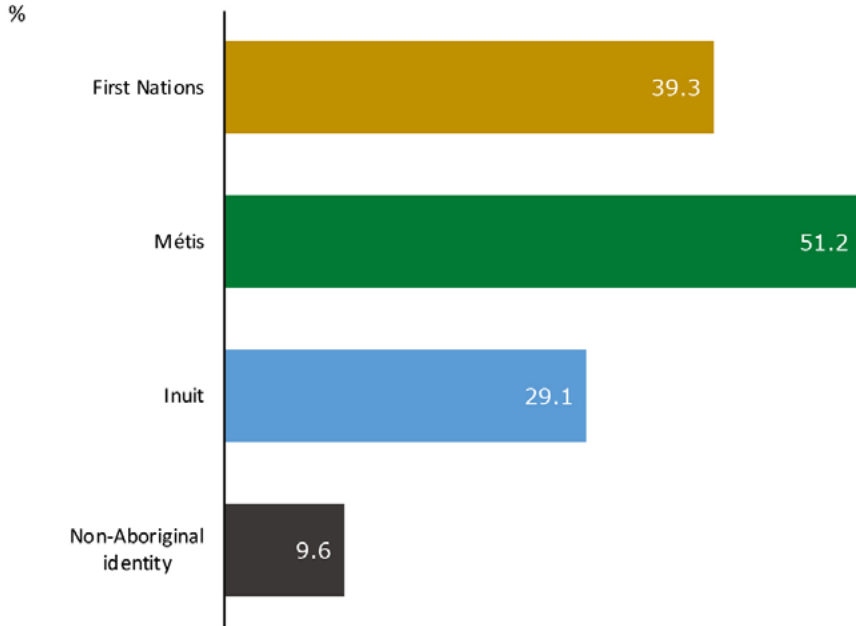
Percentage of after-tax household total income spent on food, shelter and transportation by age, Canada, 2017



Source: Statistics Canada, Survey of household spending, special tabulation.

Indigenous life and culture

First Nations, Métis, Inuit and non-Aboriginal population growth, Canada, 2006 to 2016



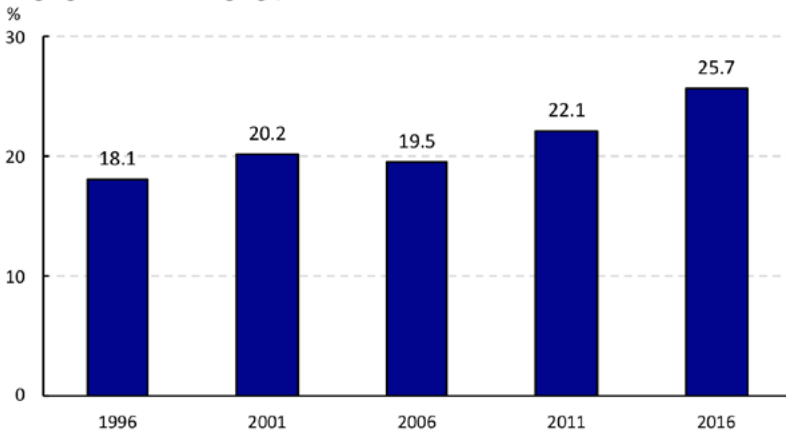
- The Indigenous population is increasing faster than the non-Indigenous population and more Indigenous people acquired an Indigenous language.
- Indigenous people have made significant gains in educational attainment, but unemployment rates among this group remain higher.
- Social and health challenges remain—suicide rates are significantly higher among Indigenous populations compared with non-Indigenous populations.

Source: Statistics Canada, Census of Population, 2006 and 2016

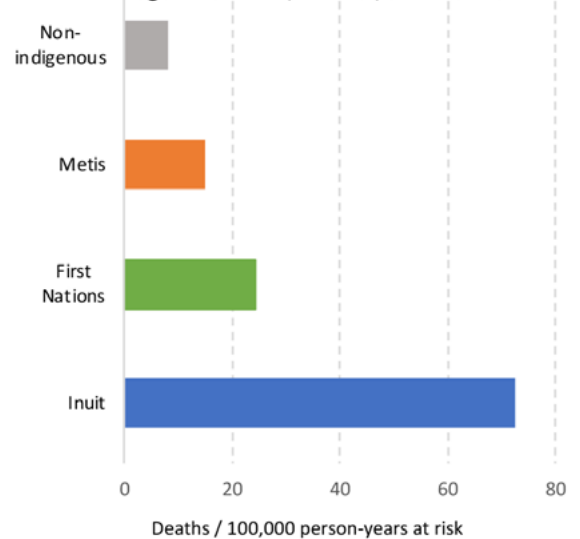
Indigenous Statistical Capacity Development Initiative:

Statistics Canada is strengthening its relationships with Indigenous organizations and communities to support them in building their own data and research capacities.

Proportion of Indigenous-language speakers who acquired an Indigenous language as a second language, 1996 to 2016



Age-standardized suicide rate by Indigenous status, Canada, 2011 to 2016



Source: Kumar, M. and M. Tjepkema. 2019. "Suicide among First Nations People, Métis and Inuit (2011-2016): Findings from the 2011 Canadian Census Health and Environment Cohort (CanCHEC)"; Ottawa: Statistics Canada, Census of Population, 2016.

Environment and climate change

The impact of climate change is becoming more acute. Understanding the different facets of climate change requires new, innovative ways of developing and analyzing data. We cannot continue to examine social and economic issues in isolation. They need to be looked at in the context of ecological assets, ecosystem services and the changing impacts of climate change.

- Environmental and clean technology activities accounted for 3% of GDP in 2017, as trade and jobs related to these activities continued to expand.
- Household activities—either directly or indirectly—account for about 40% of Canada’s greenhouse gas (GHG) emissions.
- Differences in socioeconomic risks across communities may affect their ability to respond to—and recover from—natural disasters.
- The population in urban areas is rising, as are commuting times. Despite decreasing levels of fine particulate matter, air pollution still has a negative impact on longevity.
- The built environment can have positive impacts on health.

Many environmental and clean technology jobs are relatively high paying and high skilled

- Average annual wages for environmental and clean technology (ECT) jobs are higher than those for non-ECT jobs across comparable educational levels.
- Two-thirds of ECT jobs employ workers with some postsecondary education.
- Engineering positions are relatively well represented in the ECT sector.

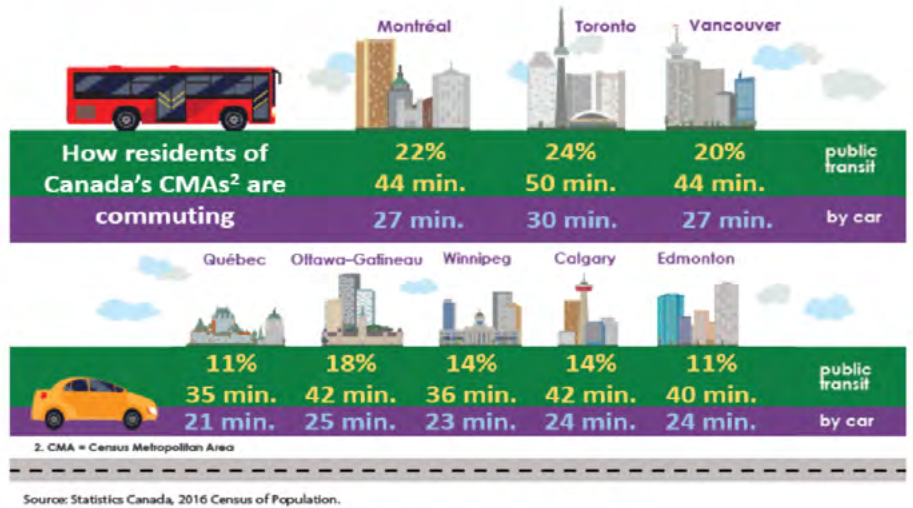


Source: Statistics Canada, Portrait of environmental and clean technology jobs in Canada, 2017

The distance to work has increased across the eight largest CMAs

In 2016

- 1.5 million Canadians spent at least 60 minutes commuting one way to work
- Approximately 60% of workers with a usual place of work and a long commute by car worked in Toronto, Montréal or Vancouver.



Use of sustainable transportation is increasing in large cities, but challenges remain

7%



Proportion of car commuters who are taking at least 60 minutes to go to work

Significantly higher in Toronto and surrounding municipalities



12%



Proportion of Canadian commuters using public transit, up from 10% in 1996

Among those going from the suburbs to the downtown core, public transit use increased significantly...

...but among suburb-to-suburb commuters (more than 5km), most people drive to work, and public transit take-up rates remained low

Percent using public transit, traditional commuters (from a suburb to the downtown core)

	1996	2016
Toronto	53	67
Montréal	38	55
Vancouver	30	45

Percent using public transit, suburb-to-suburb commuters with a commute of more than 5km

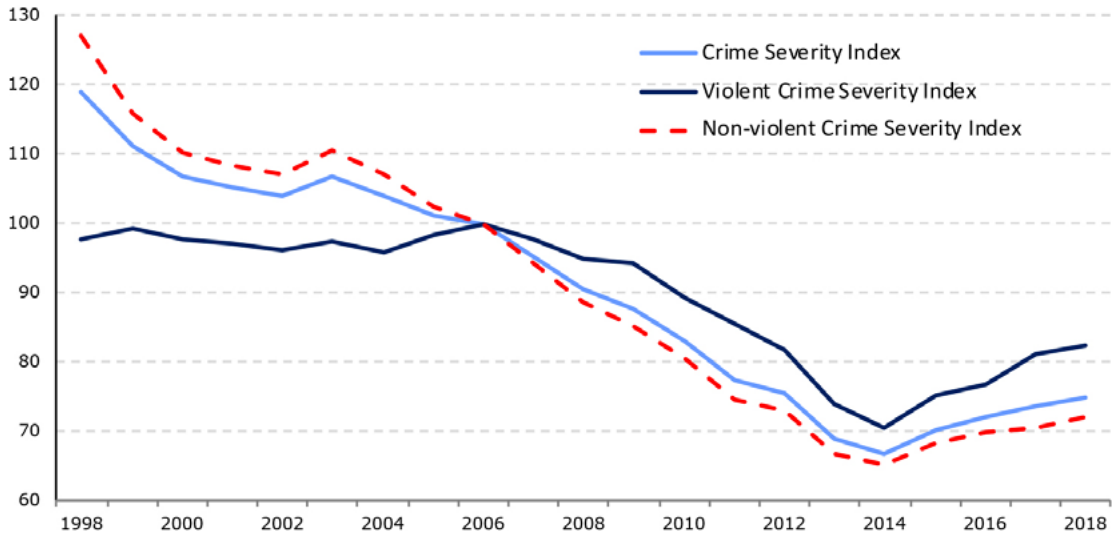
	1996	2016
Toronto	13	13
Montréal	12	10
Vancouver	9	13

Crime and community safety

For almost four decades, Statistics Canada has been working with the federal, provincial and territorial justice communities to leverage administrative data to provide information to the public and decision makers on the nature and extent of crime, victimization, and the administration of criminal and civil justice in Canada.

The Crime Severity Index increased for the fourth consecutive year

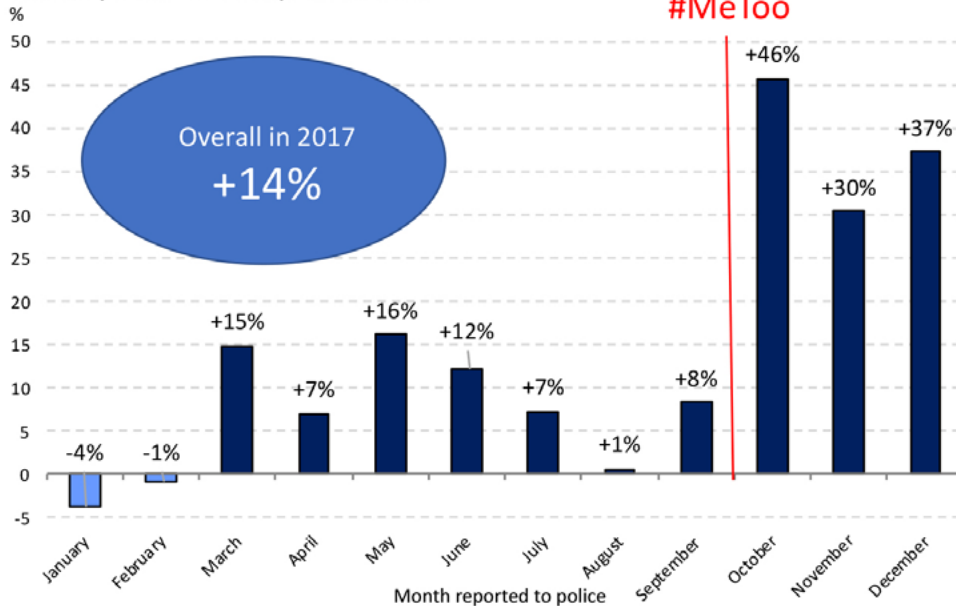
Police-reported Crime Severity Indexes, Canada, 1998 to 2018
2006=100



Source: Statistics Canada, Uniform Crime Reporting Survey, 2018

Police-reported sexual assault in Canada peaked in October 2017, coinciding with the widespread #MeToo movement

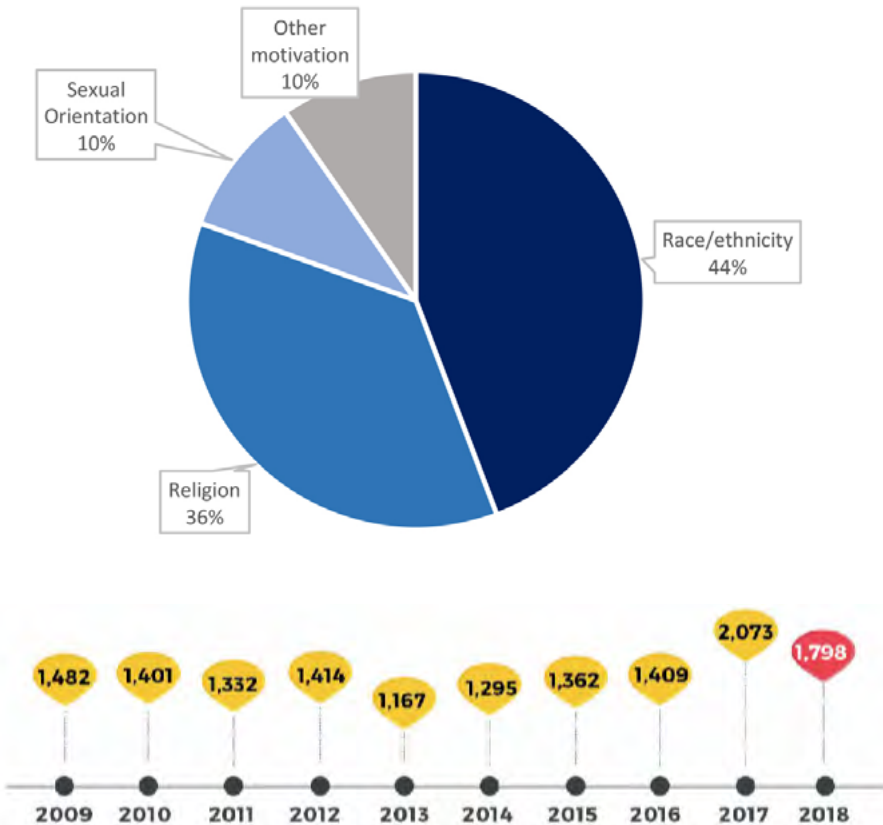
Percent change in number of victims of police-reported sexual assault, by month, 2017 compared with 2016



Source: Statistics Canada, Uniform Crime Reporting Survey, 2018

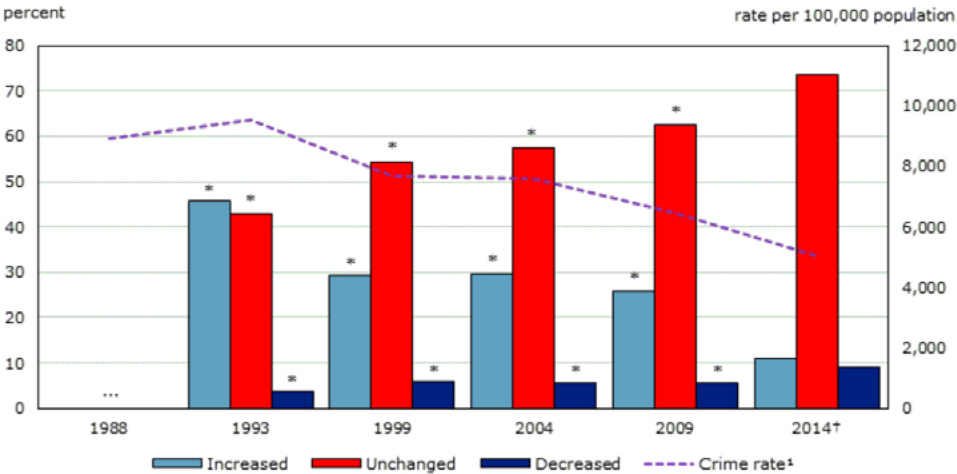
Hate crime motivations, 2018

Police reported hate-crimes dropped in 2018, but have been trending upward over the last decade—most were motivated by race, ethnicity or religion



Canadians' perception of changes in the level of crime in their neighbourhood over the previous five years, 1993 to 2014

The vast majority (88%) of Canadians are either satisfied or very satisfied with their personal safety from crime



... not applicable
 * significantly different from reference category ($p < 0.05$)
 † reference category
 1. This rate is for all offences in the *Criminal Code*, except traffic offences. Includes the Territories. Only crime rates for the years in the table are included in the "crime rate" line. As a result, this is the general trend and does not account for annual variations. For the crime rate for each year, see CANSIM Table 252-0051.
Note: The answers "Don't know" and "Refusal" are included in the calculation of the percentages, but do not appear in the chart. The Territories are excluded from data on the perception of changes in the level of crime.
Source: Statistics Canada, General Social Survey and Uniform Crime Reporting Survey.



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