

NOTE: The current COPS projections were completed in 2019, well before the 2020 COVID-19 outbreak that resulted in exceptional and abrupt economic and labour market disruptions in Canada as well as abroad. However, the focus of the COPS projections is on long-term trends in industrial and occupational labour markets, not on short-term developments. At the moment, these long-term trends are not expected to be affected markedly by the COVID-19 outbreak as its impacts are generally foreseen to be temporary.

Sources of job openings

- Job openings are positions that need to be filled due to:
 - expansion demand (new jobs generated through economic growth)
 - replacement demand (any existing jobs which have been vacated and that require to be replaced)



Job openings are comprised of two primary components: expansion and replacement demand.

- Expansion demand corresponds to the job creation generated by economic growth. It can be understood as “required employment” - that is, the number of people required to reach a certain level of production, given a specific level of productivity.
- Replacement demand corresponds to any existing jobs which have been vacated due to retirements, deaths and emigration.

About the occupational groupings used to assess labour market conditions

- The current exercise uses the 2016 NOC, which is the most up-to-date version of the classification, and covers the period 2019-2028.
- The 2016 NOC has 500 occupations. However, many of these occupations are small in terms of employment. Such occupations were combined into broader groupings according to the specific tasks of each occupation. By grouping small occupations with similar tasks together, 293 occupational groupings were obtained. Occupations that were grouped are marked with an asterisk (*).



For more information on the 293 occupational grouping used in COPS, please visit: <http://occupations.esdc.gc.ca/sppc-cops/l.3bd.2t.1ilshtml@-eng.jsp?lid=59&fid=1&lang=en>

Job Openings due to Economic Growth – Expansion Demand – (Employment Growth)



Over the next 10 years, economic growth is expected to generate about 1.7 million new jobs (174,000 on average every year), which represent an annual average growth rate of 0.9%. In the long term, job creation will become increasingly constrained by the slower pace of growth anticipated in the labour force (see the document Macroeconomic Outlook).

Occupational employment is driven by the degree to which the various occupations are utilized in each industry (occupational effect) and by the economic growth of the industries that employ them (industrial effect).

The occupational effect impacts occupational employment via the productivity and utilization levels of each of the occupations in the economy encompassed by technological advances. This effect sometimes leads to job losses in some occupations, but also to job growth in some others or even the creation of new occupations.

While expansion demand is primarily driven by macroeconomic and demographic factors, technology is also reallocating jobs at the industrial and occupational levels.

- Automation is already well underway in many sectors of the economy and is expected to accelerate with new applications enabled by technological progress.
- In general, automation affects employment in two opposing ways:
 - Negatively: by directly displacing workers from tasks they were previously performing.
 - Positively: by increasing the demand for labour in other jobs or industries.
- Predictions that automation will make human workers redundant have been made before, but technology has ended up creating more jobs in the long-run than it destroys in the short-run.
- This is because technology tends to reallocate jobs at the industrial and occupational levels.
- Industries and occupations involving routine tasks are generally more at risk of being automated and experience lower employment growth than those involving cognitive tasks.



In recent years, there has been an increasing interest in better understanding how technology will impact the labour market, as the automation of the production process is expected to accelerate, considering the speed of technological developments.

In general, automation affects employment in two different ways. By displacing workers from tasks they were previously performing, labour market disruptions occur over the transition period. But eventually, the increase in real wages resulting from higher productivity leads to the creation of new jobs to produce the goods and services that people want to buy with their extra income.

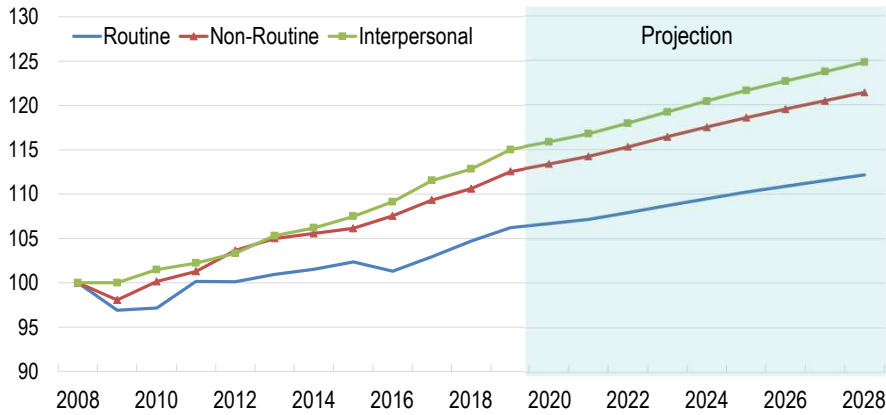
Historical evidence suggests that technology has ended up creating more jobs than it has destroyed, as jobs have been reallocated at the industrial and occupational levels. For example, the Canadian economy has evolved from agriculture to manufacturing to services over the past century.

Most experts agree that automation is not expected to destroy a large number of jobs over the next 10-20 years, as specific tasks rather than entire occupations are most likely to be automated. For instance, the introduction of computers sped up some aspects of jobs, enabling workers to do the other tasks better. Rather than destroying occupations, computers redefined them. But this process required workers to learn new skills.

The literature also suggests that industries and occupations involving routine tasks are generally more at risk of being automated and experience lower employment growth than those involving cognitive tasks. Indeed, automation tends to restrain labour demand since an increasing part of production growth is being met by productivity growth.

Over the next decades, automation should lead to a further deceleration in the demand for occupations with a high content of routine tasks.

Employment Growth by Type of Tasks
(Indexed Growth; 2008=100)



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.



The impacts of automation are expected to be more heavily felt among occupations with abundance of routine tasks, as productivity gains arising from technological innovations limit their employment growth. For example, occupations with a high proportion of routine tasks includes Pulp mill and paper converting machine operators; Labourers in rubber and plastic product manufacturing; and Harvesting labourers.

On the other hand, employment growth tends to concentrate more on occupations with larger intensity of interpersonal and non-routine tasks, where automation and technological progress are complementary to their work. For example, occupations with a high proportion of non-routine and/or interpersonal tasks include Aerospace engineers; Carpenters; Mechanics; Biologists and related scientists; Database analysts and data administrators; Computer programmers and interactive media developers; as well as Software engineers and designers.

The industrial effect influences occupational employment growth according to the performance of the industry where they are employed. In principle, occupations directly linked to industries that are expected to have strong employment growth will benefit from a positive outlook. The reverse occurs for occupations linked to industries with weak employment growth.

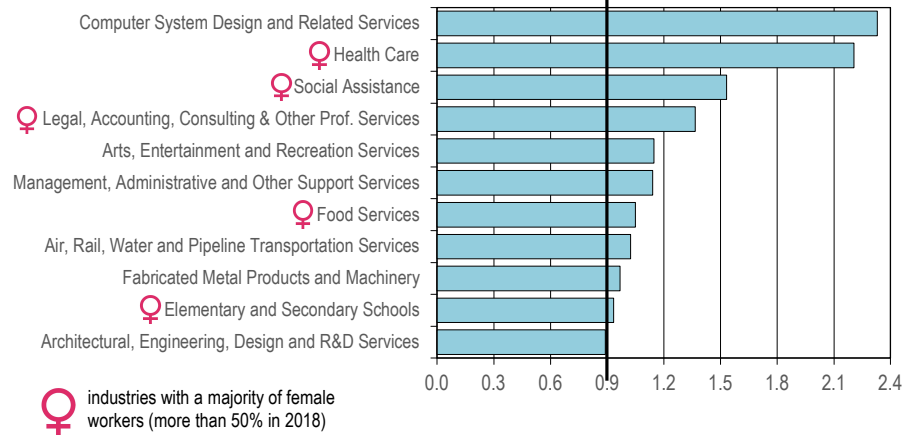
Employment growth by industry reflects the future trends anticipated in production and labour productivity for each of the 42 industries covered by COPS.

Industries that are projected to post the strongest growth in employment.

Employment Growth by Industry, Projection 2019-2028

(average annual growth, in percentage)

ECONOMY AVERAGE = 0.9%



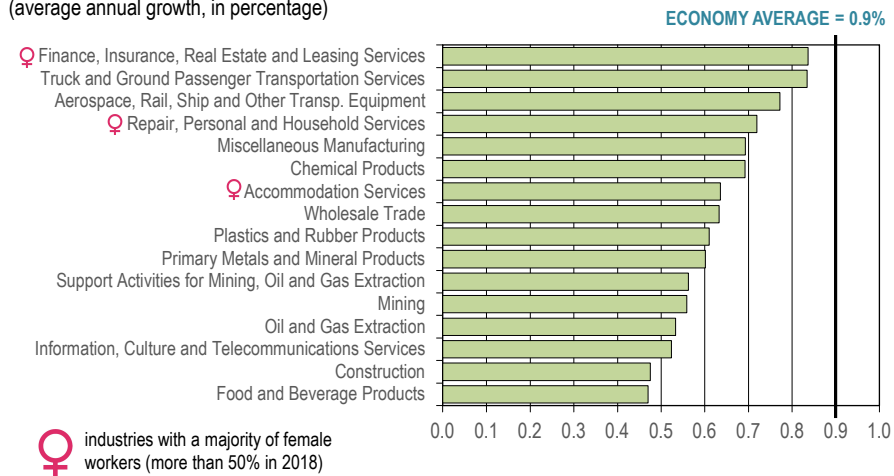
Source: ESDC 2019 COPS industrial projections.



- Industries projected to post the strongest growth in employment (i.e. above or around 0.9% annually) are also those projected to post the strongest growth in production or those that are characterized by a high degree of labour intensity. Below are some of the key drivers expected to support output and job creation in those industries:
 - Rapid innovations in information and communication technologies (ICT) and the need for businesses to continuously upgrade their ICT infrastructure to remain competitive;
 - Growing demand for health care due to population aging;
 - Increased demand for social assistance, particularly child care and family services (population aged 0-17) as well as elderly care and social services for senior citizen (population aging);
 - Growing demand for professional advice on planning, logistics, mergers, acquisitions, environmental regulation and implementation of new technologies;
 - The rising number of retired baby-boomers that are expected to have more time to spend on leisure activities, including arts, entertainment and recreation services;
 - The growing number of firms across the economy that choose to outsource administrative functions in order to remain focused on their core activities and increase operation efficiency;
 - Additional demand for food services, particularly from health care institutions and tourism activity;
 - Rising demand for air travel, particularly from emerging markets in Asia, and increased demand for the transportation of merchandises by air cargo, rail or boat, in response to the intensification of international trade and globalization (exports + imports);
 - The sharp straightening anticipated in investment related to machinery and equipment (M&E) in Canada, along with the acceleration in manufacturing activity and a positive outlook for exports;
 - Faster growth projected in population aged 5 to 17, boosting demand for teachers in elementary and secondary schools;
 - Stronger growth projected in non-residential building construction as well as the sharp straightening anticipated in business investment related to machinery and equipment (M&E) and intellectual property in Canada, including spending on research and development (R&D).

Industries that are projected to post moderate growth in employment.

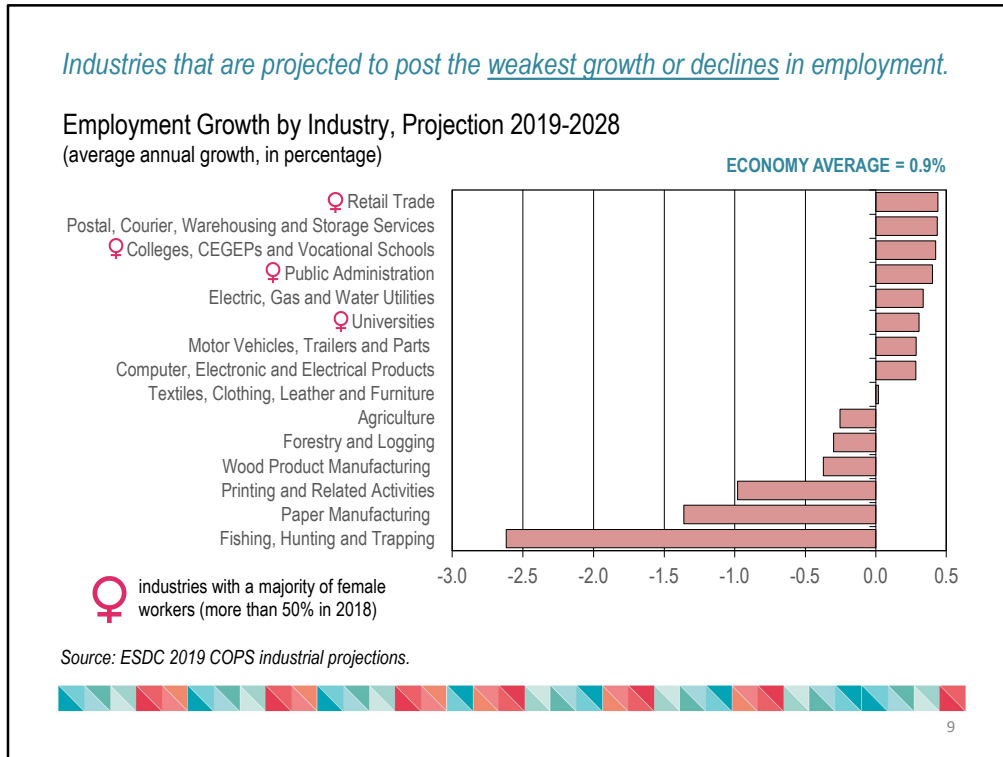
Employment Growth by Industry, Projection 2019-2028
(average annual growth, in percentage)



Source: ESDC 2019 COPS industrial projections.



- Most of the industries projected to post moderate growth in employment (i.e. below 0.9%, but above 0.4% annually) are also those projected to post moderate growth in production.
- This group includes six manufacturing industries and six commercial services industries. It also includes construction and the three industries related to oil, gas and mining extraction.
- In addition to moderate growth in production, job creation in those industries is expected to be restrained by the following factors:
 - Increased automation and rapid advances in digital and cognitive technologies;
 - The need to lower labour costs and increase productivity in manufacturing industries in response to the intensification of global competition;
 - The need to find new ways of delivering services and replace labour by capital wherever possible in response to demographic pressures on labour supply in Canada;
 - Renewed growth in productivity within the mining industry during the last five years of the projection;
 - The fact that production capacity in oil sands is increasing while becoming less labour intensive;
 - Structural changes in construction activity, more specifically the shift in the composition of housing starts from single-unit homes to multiple-dwellings (apartments and condominiums) which are more capital intensive and require less labour by unit of output.



- Most of the industries projected to post the weakest growth or declines in employment (i.e. around or below 0.4% annually) are also those projected to post the weakest growth in production.
- This group is largely composed of manufacturing and primary industries that have experienced a stagnation or a declining trend in output and/or employment over the past several years, such as textiles, clothing, furniture, agriculture, forestry, wood products, printing, paper and fishing. Such industries are expected to face similar challenges than those experienced in the last decade, including:
 - The intensification of foreign competition and the shift in production to low-cost producers;
 - Lower demand for paper and printed materials due to the growing use of electronic media;
 - Timber and fish supply constraints (allowable annual cuts and quotas on fish species);
 - The return of U.S. tariffs on Canadian exports of softwood lumber;
 - Difficulties to attract workers in agriculture and out-migration from rural/fishing communities.
- Output and employment growth is also projected to be weak in a number of commercial and non-commercial services industries. The main factors expected to weigh on those industries are:
 - The slower pace of growth anticipated in the consumption of goods (retail trade);
 - The growing use of e-mail, electronic billing and online advertising (postal/courier services);
 - The slow recovery projected in population aged 18-25 (colleges and universities);
 - Additional pressures on public finance due to demographic changes (public administration).

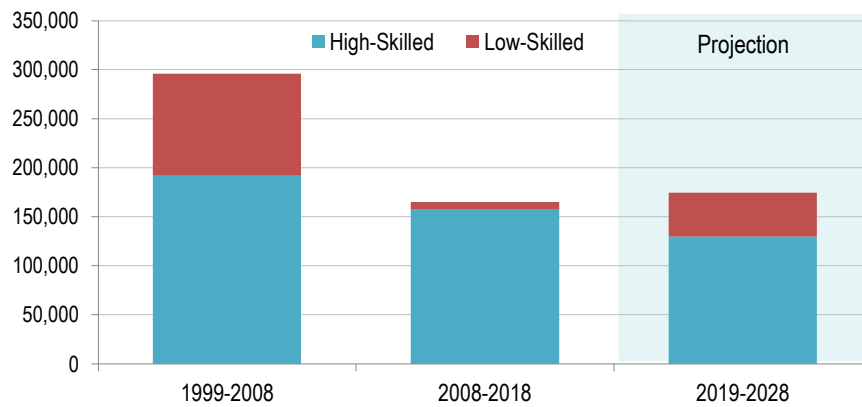
Industrial Summaries

For more details on the historical and future performance of the 42 industries covered by COPS, including key drivers of GDP, employment and productivity growth, please consult the Industrial Summaries available on the COPS website <http://occupations.esdc.gc.ca/sppc-cops/>



Over the next ten years, new job openings arising from economic growth are projected to be mainly in high-skilled positions.

Average Annual Employment Change in High- and Low-Skill Occupations



High-skill group is composed of Management, Skill Levels A and B. Low-skill group is composed of Skill Levels C and D.

Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

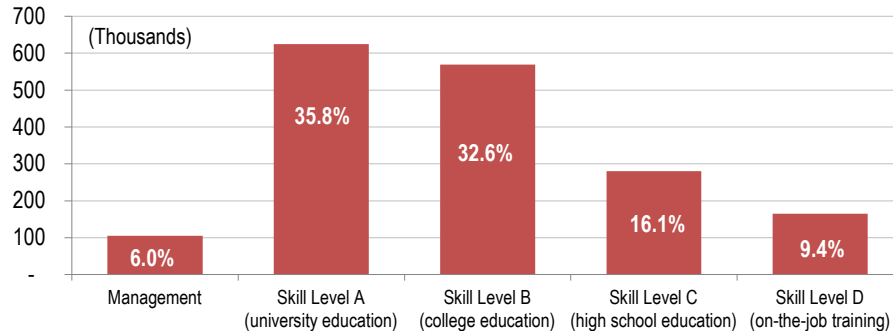


About 75% of the projected employment growth over the next 10 years is expected to be in high-skill occupations. As a comparison, high-skill occupations accounted for almost all of new job creation during the preceding decade (96%), while the number of jobs among low-skill occupations remained almost unchanged. This was largely due to the 2008-2009 recession that mostly impacted employment in low-skill occupations. However, the projected trend for the next decade is a continuation of what has been observed over the past 20 years as the Canadian economy became more knowledge-intensive, automatized and with stronger health care needs. High-skill occupations represented 63.3% of total employment in 2018.

The demand for low-skill jobs is also projected to grow, but at a lower rate. The expected demand in health and its assisting occupations; accommodation and food services; as well as the gradual recovery of some manufacturing industries after many years of struggle, will support employment growth in low-skill occupations that are concentrated in these industries.

The strong employment growth projected in high-skill occupations is mostly due to occupations that usually require university education.

Distribution of Expansion Demand by Skill Level, Projection 2019-2028



	Management	Skill Level A (university education)	Skill Level B (college education)	Skill Level C (high school education)	Skill Level D (on-the-job training)
Employment (AAGR*)	0.6%	1.5%	0.9%	0.6%	0.8%
2018 Employment Distribution	9.2%	20.2%	34.0%	26.1%	10.6%

Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections. * AAGR: Annual Average Growth Rate.

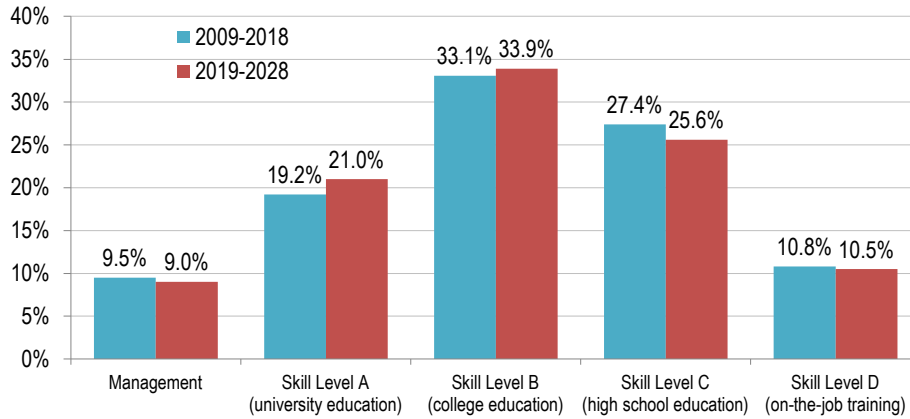
In 2018, the largest share of employment was in occupations that usually require a college education or apprenticeship training (skill level B), followed by those that usually require high school education (skill level C). Occupations that usually require a university education (skill level A), only on-the-job training (skill level D), and management occupations ranked third, fourth and fifth, respectively.

Over the projection period, occupations that usually require a university education (skill level A) are expected to have the fastest overall employment growth, contributing also to the largest number of jobs created among all skill levels. This is mostly the result of strong growth expectations in occupations related to professional services in health, as well as in the natural and applied sciences fields, especially among the information technology sector.

Occupations that usually require a college education or apprenticeship training (skill level B) are projected to have the second largest contribution in terms of job creation.

This situation will result in a slight increase in the share of high-skill occupations within total employment.

Distribution of Employment by Skill Level



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.



As about 75% of the employment growth is expected to be in high-skill occupations over the period 2019-2028, the projected proportion of high-skill jobs in total employment is expected to increase to 63.9% on average over the projection period, up from 61.8% of total employment on average over 2009-2018.

Employment growth is expected to be faster in high-skill occupations, and slower in low-skill and some management occupations.

2-Digit Occupational Groupings by Projected Employment Growth, 2019-2028
(average annual growth)

Growth above 1.3%*	Growth below 0.5%*
Professional occupations in nursing	Sales representatives and salespersons - wholesale and retail trade
Assisting occupations in support of health services	Senior management occupations
Professional occupations in health (except nursing)	Industrial, electrical and construction trades
Technical occupations in health	Middle management occupations in retail and wholesale trade and customer services
Paraprofessional occupations in legal, social, community and education services	Middle management occupations in trades, transportation, production and utilities
Professional occupations in natural and applied sciences	Processing and manufacturing machine operators and related production workers
Professional occupations in business and finance	Labourers in processing, manufacturing and utilities
Professional occupations in law and social, community and government services	Distribution, tracking and scheduling co-ordination occupations
	Workers in natural resources, agriculture and related production
	Office support occupations

*Annual growth rate for total employment is 0.9%. Boundaries were set at plus and minus 4 percentage points of this growth rate.



Source: ESDC 2019 COPS Projections.

The growing demand for healthcare and the structural change towards a more knowledge-based economy are expected to stimulate the demand for high-skill occupations over the projection period. Indeed, employment growth is expected to be faster among professional and technical services in health, as well as in natural and applied sciences occupations.

With the exception of some occupations, growth for management occupations is projected to be close the aggregate average, but employment in highly skill management positions (for example managers in health, technology and engineering) is expected to register stronger growth. Yet, employment in senior management occupations has declined since 2004, mostly because of the budget deficits reduction initiatives recorded by the various levels of government and because of the financial crisis. This situation is expected to continue at a slower pace over the projection period as austerity measures ease.

A weaker economic outlook in forestry and fishing, as well as in some manufacturing industries such as paper, printing, textile and clothing, is expected to limit employment growth in low-skill occupations that are related to these industries.


With the exception of the management occupations, the occupational groupings that are projected to grow at a slower pace (below 0.5%) have a higher content of routine tasks. The literature shows that occupations with a high degree of routine tasks have a higher probability of being negatively impacted by automation.

For instance, occupations related to office and clerical work are expected to also have below average employment growth. This is mostly due to the constant introduction of technologies that continue to transform secretarial work, leading to the specialization of administrative duties.

Most of the 10 detailed occupational groupings with the strongest projected employment growth are in the health and IT sectors.

Top 10 4-Digit Occupations with the Strongest Annual Average Employment Growth, 2019-2028			
NOC	Occupations	Employment (2018)	Growth Rate (2019-2028)
3111	Specialist physicians	48,500	3.2%
3011	Nursing co-ordinators and supervisors ♀	34,000	3.5%
3112	General practitioners and family physicians ♀	75,200	3.2%
3012	Registered nurses and registered psychiatric nurses ♀	314,300	2.9%
3142	Physiotherapists ♀	28,300	2.7%
3120*	Optometrists, chiropractors and other health diagnosing and treating ♀	33,700	2.6%
3143*	Occupational therapists & Other professional occupations in therapy and assessment ♀	26,800	2.6%
4212	Social and community service workers ♀	132,200	2.6%
3413*	Nurse aides, orderlies and patient service associates & Other assisting occupations in support of health services ♀	321,000	2.6%
2173	Software engineers and designers	57,600	2.3%

♀: Occupations where at least 50% of their workers were women in 2018.



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

At a more detailed occupational level (4-digit NOC groupings), nine out of the ten occupations with the fastest projected employment growth are in the health sector (NOCs 3111, 3011, 3112, 3012, 3142, 3120, 3143, 4212 and 3413). This reflects the fact that the population is aging, increasing the need for healthcare professionals and related occupations.

Although only one occupation related to the information and technology sector (NOC 2173) is among the ten occupations with the fastest projected employment growth, most other occupations related to that field are also expected to record above average growth. For instance, employment in Information systems analysts and consultants (NOC 2171) and Database analysts and data administrators (NOC 2172) is expected to grow by 2.2% and 2.1% annually over the projection period. Demand among these occupations is expected to be supported by rapid technological changes. Technological innovations will keep evolving, inducing Canadian firms to constantly adapt and upgrade their IT infrastructure to remain competitive. In addition, new technologies such as artificial intelligence, 3D printing and Blockchain will continue to emerge, thereby supporting the demand for workers in these occupations. Furthermore, continued innovations such as virtual and augmented reality, and 5G mobile will provide new job opportunities for these workers.

The strongest employment declines are expected in some occupations related to fishing, services and administrative activities.

Top 10 4-Digit Occupations with the Largest Annual Average Employment Decline Rates, 2019-2028

NOC	Occupations	Employment (2018)	Growth Rate (2019-2028)
8260*	Fishing vessel masters and fishermen/women	11,300	-2.6%
8440*	Other workers in fishing and trapping and hunting occupations	4,100	-2.6%
1422*	Data entry clerks & Desktop publishing operators and related occupations ♀	34,100	-2.5%
6521	Travel counsellors ♀	17,300	-2.4%
1434*	Banking, insurance and other financial clerks & Collectors ♀	37,200	-1.9%
4411*	Home child care providers ♀	35,200	-1.6%
9432*	Pulp mill machine operators; Papermaking and finishing machine operators & Paper converting machine operators	14,400	-1.5%
1241	Administrative assistants ♀	217,700	-1.5%
1512	Letter carriers	28,800	-1.3%
1450*	Library, correspondence and other clerks ♀	43,000	-1.3%

♀: Occupations where at least 50% of their workers were women in 2018.



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

The two occupations (NOC 8260 and 8440) that are expected to face the largest job losses are unique to the fishing industry. Both occupations are relatively small. Fish supply constraints and the various quotas and moratorium as well as productivity growth from the increased use of more efficient fishing gears are expected to continue to lower employment in the fishing industry over the projection period.

Technological progress is the main responsible for the employment declines anticipated in most other occupations. Computerization is expected to have a strong impact on data entry clerks, and desktop publishing operators and related occupations (NOC 1422*). Machine learning and machine text reading are just some examples of technologies that are negatively impacting job opportunities in this occupation. The expected employment decline among Administrative assistants (NOC 1241) is due to ongoing office automation, which makes many of those positions redundant. In addition, the specialization of administrative tasks has transferred some of these jobs to more specialized administrative occupations. In fact, occupations related to general office support are also expected to have poor employment growth.

The fast introduction of computerization in the financial sector is also largely responsible for the projected decline in banking, insurance and other financial clerks and collectors (NOC 1434). This occupation has experienced strong job losses since 2009, a trend that is only expected to moderate over the projection period. New technology, the rise of online publishing and the subsequent transition away from paper documents have negatively impacted employment within the letter carriers (NOC 1512) and library, correspondence and other clerks (NOC 1450). Similarly, for travel counsellors (NOC 6521), expected employment losses reflect the continued popularity of airline tickets and trip packages sales on the Internet and the decrease in commissions paid to travel agencies by air carriers. Finally, technological advancements and the increased use of digital imaging has come at the expense of printing press operators jobs (NOC 9432).

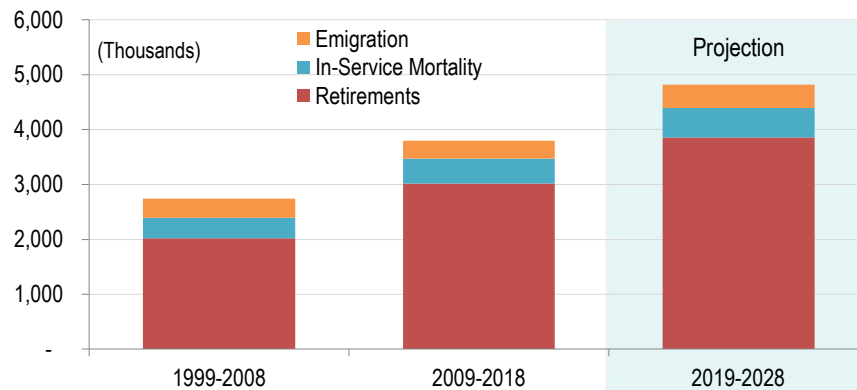
The creation of many regulated child care spaces in early childhood centers across the country led to a decline in the demand for home child care provider services (NOC 4411) and this trend is expected to continue to reduce employment in this occupation.

**Job Openings
in Existing Positions
– Replacement Demand –**



Retirements represent an increasingly important source of replacement demand.

Sources of Replacement Demand



Note: Historical retirements are constructed using data from the Longitudinal Administrative Database (LAD). Retirement is defined as a complete and permanent withdrawal from the labour market.

Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

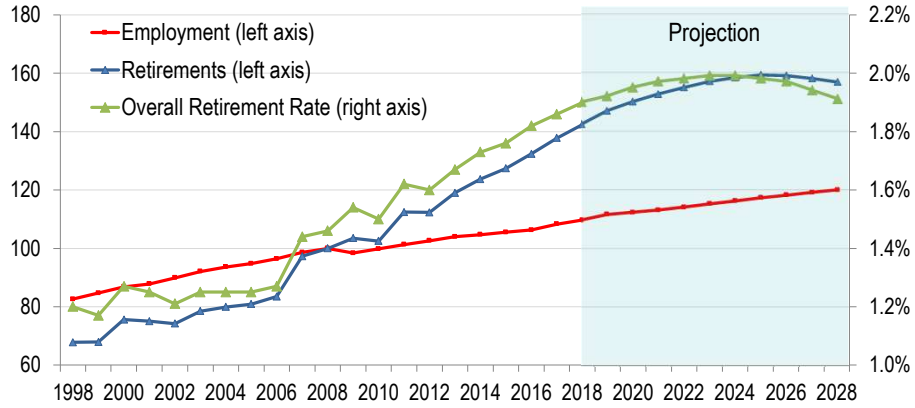


Economic growth is not the only source of job openings. Replacement demand is the other major source of job openings. These openings are vacancies created by the following factors:

- Retirements: approximately 3.9 million positions are expected to open up due to retirements over the period 2019-2028. As the baby-boom generation retires, the replacement demand generated from this source is expected to rise rapidly. Over the coming decade, retirements are projected to represent 80% of replacement demand, as compared to 79% over 2009-2018 and 74% over 1999-2008;
- In-service mortality: about 533 thousand vacancies are expected to open up due to in-service mortality; and
- Emigration: nearly 425 thousand vacancies are expected to open up due to emigration.

Retirements are expected to increase at a substantially faster rate than employment and the labour force.

Overall Retirement Rate and Indexed Growth of Retirements and Employment
(Indexed Growth; 2008=100)



Sources: ESDC Estimates (historical data) and ESDC 2019 COPS Projections.



Retirement growth and employment growth were comparable prior to 2007, but the former started outpacing the latter as of 2007. As a result, the overall retirement rate, expressed as the number of retirees per employed worker, grew from 1.3% in 2006 to 1.9% in 2018.

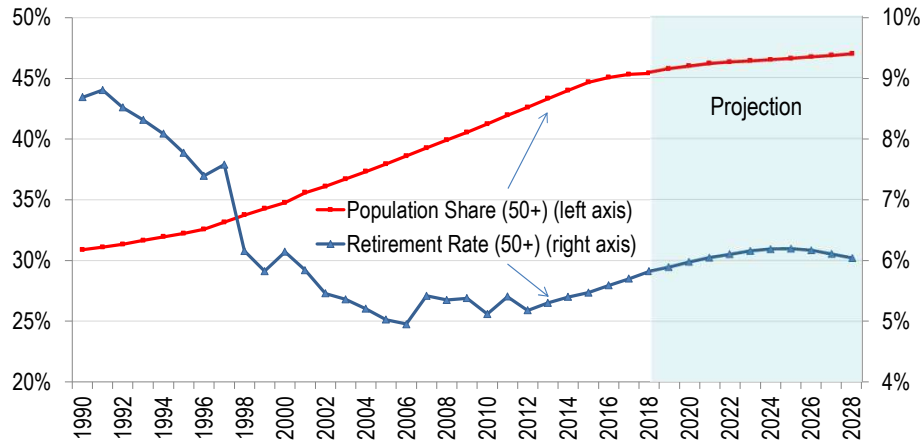
This overall retirement rate is expected to reach 2.0% in the early 2020s. Accordingly, the acceleration in the number of retirees seen since 2008 is expected to continue, at least over the first half of the coming decade. However, as all baby boomers will be over 65 years old by 2026, the volume and rate of retirements will reach a plateau towards the end of the projection period, before starting to decline beyond 2028.

The number of retirements is projected to rise from an annual average of 302,000 over the period 2009-2018 to 386,000 over the period 2019-2028.

As a result, retirements are expected to account not only for the largest, but also an increasing source of the replacement demand and the total job openings.

The projected increase in the number of retirements is primarily due to the ageing of the large baby boom cohort.

Share of the Population Aged 50 and Over and its Retirement Rate



Sources: ESDC Estimates (historical data) and ESDC 2019 COPS Projections.

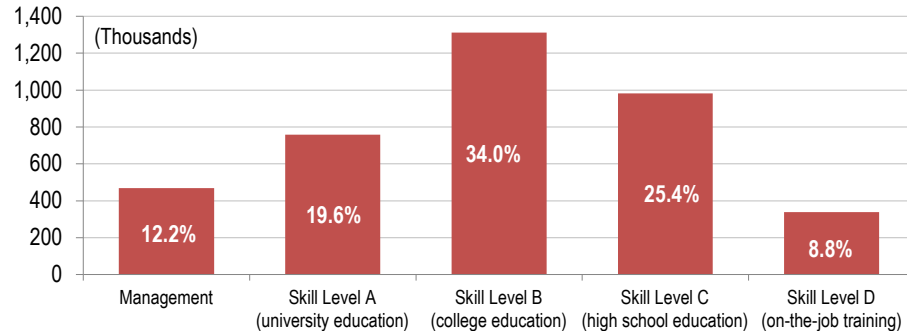


The expected continued rise in the number of retirements and the overall retirement rate is explained by the ageing of the Canadian population.

As more and more members of the baby boom generation reach retirement age, the proportion of the population that are 50 years old or older is expected to continue to increase. Additionally, the upward trend in the retirement rate of these workers is projected to continue gradually, reaching 6.2% over the projection period, up from 5.4% over the period 2009-2018. Nevertheless, this rate is expected to reach a plateau in the mid 2020s as all baby boomers will be 65 years old or older, and most of them would have retired towards the end of the projection period.

About two-thirds of projected retirements are in high-skilled occupations or in management.

Distribution of Retirements by Skill Level, Projection 2019-2028



	Management	Skill Level A (university education)	Skill Level B (college education)	Skill Level C (high school education)	Skill Level D (on-the-job training)
Ave. Annual Retirement Rate	2.7%	1.8%	2.0%	2.0%	1.6%
10-Year Retirements	469,600	757,900	1,310,700	981,700	339,300

Source: ESDC 2019 COPS Projections.

However, retirements are not evenly distributed amongst occupations. Indeed, high-skill occupations, which represented 63.3% of total employment in 2018, are expected to represent 65.8% of the job openings generated by retirements over the projection period.

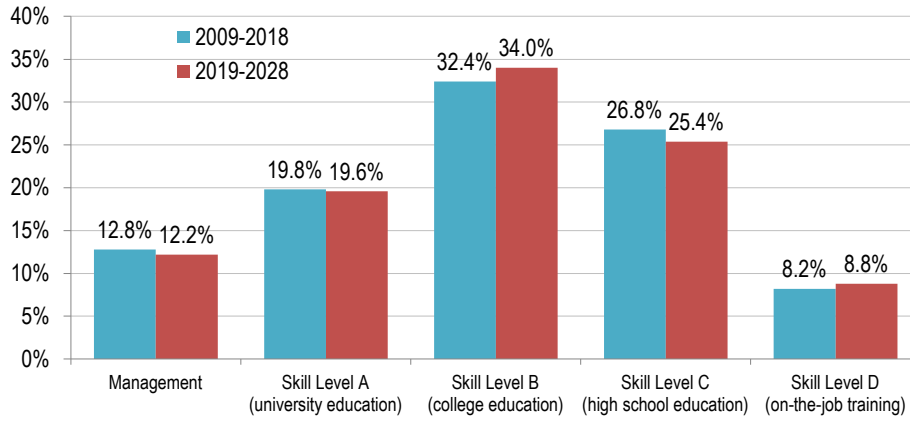
Except for management occupations and those usually requiring only on-the-job training (skill level D), these proportions reflect the relative employment distribution across skill levels. Hence, the majority of the retirements are projected to be in the skill levels that have the largest proportions of employment. That is, they are expected to be in larger quantities in occupations usually requiring college education or apprenticeship certificate (skill level B) and in those usually requiring high school education (skill level C).

Retirements will generate a disproportionately larger number of job openings in management occupations as these workers tend to be significantly older than average, but they also tend to retire just at a slightly older age. On the other hand, workers in occupations that usually require only on-the-job training tend to be younger than average and tend to retire at a similar age, translating into a lower volume of retirements.

Therefore, projected retirement rates are the highest in management occupations and the lowest in occupations usually requiring on-the-job training (skill level D).

The distribution of retirements by skill level is projected to remain relatively stable over the period 2019-2028 when compared to the preceding decade.

Distribution of Retirements by Skill Level



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.



Yet, the distribution of retirements by skill level is projected to remain relatively stable over the period 2019-2028 when compared to the preceding decade.

Occupations with the largest number of retirements are projected to be in occupations typically large in employment size.

Top 10 4-Digit Occupations with the Largest Number of Retirements, 2019-2028			
NOC	Occupations	Total Retirements	Retirement Rate
0621	Retail and wholesale trade managers	97,200	3.0%
6421	Retail salespersons ♀	84,200	1.5%
3012	Registered nurses and registered psychiatric nurses ♀	72,500	2.0%
7511	Transport truck drivers	71,200	2.1%
3413*	Nurse aides, orderlies and patient service associates & Other assisting occupations in support of health services ♀	68,300	1.8%
1221	Administrative officers ♀	67,400	3.4%
6731	Light duty cleaners ♀	64,400	2.4%
6411	Sales and account representatives – wholesale trade	64,000	2.4%
6733	Janitors, caretakers and building superintendents	62,800	3.3%
1241	Administrative assistants ♀	61,200	3.0%

♀: Occupations where at least 50% of their workers were women in 2018.

Source: ESDC 2019 COPS Projections.



Similarly, at the detailed occupational level (4-digit NOC groupings), occupations with the largest projected need to replace retirees are mostly due to their employment size. In fact, half of the top ten occupations have retirement rates that are similar to the average. However, retail and wholesale trade managers (NOC 0621), administrative officers (NOC 1221), janitors, caretakers and building superintendents (NOC 6733), and administrative assistants (1241) have higher than average retirement rates. On the other hand, the occupation of retail salespersons (NOC 6421) is expected to have a below average retirement rate.

Occupations with the strongest retirement pressures are expected to be concentrated in management.

Top 10 4-Digit Occupations with the Highest Retirement Rates, 2019-2028

NOC	Occupations	Total Retirements	Retirement Rate
0113*	Purchasing managers & Senior managers - health, education, social and community services and membership organizations	7,800	5.7%
0421	Administrators - post-secondary education and vocational training ♀	5,600	4.4%
0010*	Legislators and senior management	25,200	4.4%
4154	Professional occupations in religion	11,000	4.2%
0632	Accommodation service managers	28,600	4.1%
7272	Cabinetmakers	1,700	3.9%
0811	Managers in natural resources production and fishing	4,300	3.9%
1224	Property administrators ♀	12,000	3.8%
9463	Fish and seafood plant workers ♀	1,600	3.8%
9441*	Textile fibre and yarn, hide and pelt processing machine operators and workers; Weavers, knitters and other fabric making occupations; Fabric, fur and leather cutters & Inspectors and graders, textile, fabric, fur and leather products manufacturing ♂	2,400	3.7%

♀: Occupations where at least 50% of their workers were women in 2018.



Source: ESDC 2019 COPS Projections.

Occupations with the strongest projected retirement pressures (as per their retirement rates) are concentrated in management, reflecting an older workforce in those areas of the labour market. Indeed, managers tend to be older and tend to retire at a slightly older age than the average.

A large number of the occupations with the weakest projected retirement pressures are related to sales and services.

Top 10 4-Digit Occupations with the Lowest Retirement Rates, 2019-2028			
NOC	Occupations	Total Retirements	Retirement Rate
3213	Animal health technologists and veterinary technician ♀	700	0.3%
0130*	Managers in communication (except broadcasting)	500	0.3%
6511	Maitres d'hôtel and hosts/hostesses ♀	2,900	0.4%
4012	Post-secondary teaching and research assistants ♀	3,900	0.5%
6513	Food and beverage servers ♀	11,800	0.6%
8614*	Mine labourers & Oil and gas drilling, servicing and related labourers	600	0.6%
6562	Estheticians, electrologists and related occupations ♀	3,900	0.6%
5250*	Athletes, coaches, referees and related occupations ♀	11,100	0.7%
6512	Bartenders ♀	2,700	0.7%
6311	Food service supervisors ♀	6,200	0.7%

♀: Occupations where at least 50% of their workers were women in 2018.

Source: ESDC 2019 COPS Projections.



On the other hand, five of the ten occupations with the lowest retirement rates are expected to be in sales and services, which tend to employ a younger workforce.

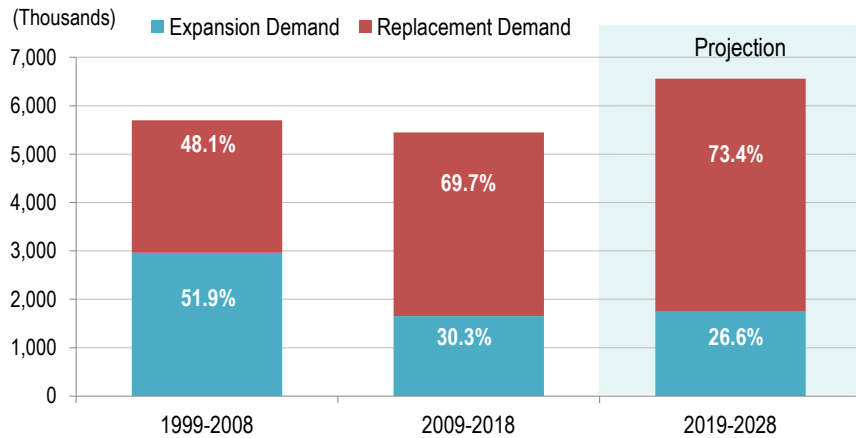
Although managers in communication (except broadcasting) (NOC 0130) are on average older than workers in non-managerial occupations, they are relatively younger than other management occupations. They also tend to retire much later in their career compared to most managers. In fact, the average retirement age in this occupational grouping is among the highest of all occupations. The late retirement age coupled with a relatively young workforce for a management occupation explain the very low retirement rate.

Total Job Openings



Replacement demand is projected to represent nearly three quarters of all job openings over the coming decade.

Job Openings from Expansion and Replacement Demand



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

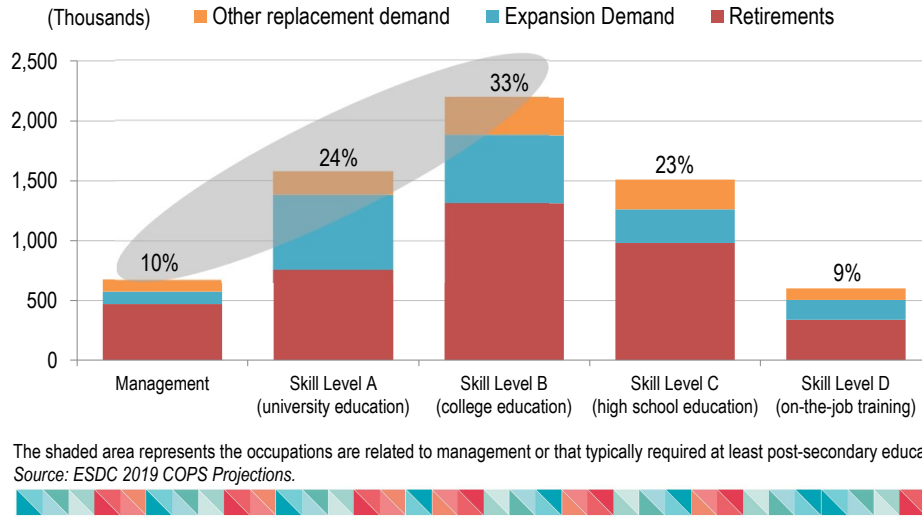


A total of 6.56 million job openings (those due to economic growth plus those due to replacement needs) are expected over the period 2019-2028. About 1.7 million are projected to be new positions as a result of increasing economic activity (expansion demand or employment growth), while over 4.8 million are projected to be existing positions being vacated due to replacement needs (retirements will account for 3.9 million of the 4.8 million positions being vacated).

As a result, replacement demand (mainly from retirements) is expected to represent 73.4% of all projected job openings over the period 2019-2028, up from 69.7% in 2009-2018 and 48.1% in 1999-2008.

Two-thirds of all projected job openings are in occupations usually requiring post-secondary education or in management occupations.

Job Openings from Expansion and Replacement Demand by Skill Level, Projection 2019-2028



At the skill level, more than two-thirds (or about 4.4 million) of the job openings are expected to be in occupations that usually require post-secondary education (university, college or vocational) or in management occupations. In fact, 75% of new jobs created by economic expansion are projected to be in occupations generally requiring post-secondary education or in management occupations, whereas 65.4% of job openings due to replacement are in these occupational groups, for a combined average of 67.8% (around 4.4 million).

Given that 75% of the new jobs are expected to be in high-skill occupations over the period 2019-2028, the proportion of high-skill jobs in total employment will continue to rise in the coming decade. Indeed, the share of high-skill occupations out of total employment has grown from 60.2% in 2008 to 63.3% in 2018, and it is expected to reach 64.3% in 2028.

Over the next ten years, less than one-third of job openings (around 2.1 million) are expected to be in occupations usually requiring high school education or on-the-job training.

Two healthcare occupations are in the top three of the list of occupations with the largest number of job openings.

Top 10 4-Digit Occupations with the Largest Number of Job Openings, 2019-2028

NOC	Occupation	Employment (2018)	Job Openings (2019-2028)
3012	Registered nurses and registered psychiatric nurses ♀	314,300	191,200
3413*	Nurse aides, orderlies and patient service associates & Other assisting occupations in support of health services ♀	321,000	178,600
6421	Retail salespersons ♀	566,700	126,500
7511	Transport truck drivers	317,700	119,900
0621	Retail and wholesale trade managers	324,600	113,900
2171	Information systems analysts and consultants	216,000	113,000
6731	Light duty cleaners ♀	245,900	108,900
6411	Sales and account representatives - wholesale trade (non-technical)	248,700	98,900
6711	Food counter attendants, kitchen helpers and related support occupations ♀	386,700	98,600
4032	Elementary school and kindergarten teachers ♀	322,000	97,900

♀: Occupations where at least 50% of their workers were women in 2018.



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

At the more detailed occupational level, occupations that are projected to have the largest number of job openings usually have a large employment size, resulting in relatively large replacement needs. Indeed, employment in those 10 occupations (10 out of 293 occupations) accounted for about 17.5% of total employment in 2018. They can be summarized as follows:

- Two healthcare occupations are in the top three of the list of occupations with the largest number of job openings. Registered nurses and registered psychiatric nurses (NOC 3012) as well as Nurse aides, orderlies and patient service associates & Other assisting occupations in support of health services (NOC 3413/3414) are expected to have above average employment growth over the projection period. Given their large employment size, they are also expected to have large volumes of retirements. As the Canadian population ages, the demand for health services and consequently the need for healthcare professionals are projected to increase. Moreover, the commitment made by some provinces to reduce wait times at emergency rooms as well as for surgical procedures and specialized treatments is expected to contribute to the increase of labour demand for workers in these occupations.
- Similarly, employment growth is expected to be above average for Information systems analysts and consultants (NOC 2171), which will generate a large volume of job openings. Demand for workers in this occupation is expected to be supported by technological changes. Indeed, rapid innovation will continue to encourage firms to adapt quickly and upgrade their IT infrastructure to remain digitally safe and competitive. The increasing popularity of data science and analytics, involving predictive analysis, machine learning as well as artificial intelligence; will provide numerous opportunities to work as information systems analysts and consultants. Finally, the rising number and complexity of cyber attacks is expected to boost demand for workers with specific skills related to cyber security.
- Five occupations (NOC 6421, 0621, 6731, 6411 and 6711) in sales and services are also part of the top 10 occupations where we expect the largest number of job openings, but mostly as a result of their large employment size. A similar case occurs with Elementary school and kindergarten teachers (NOC 4032).
- Job openings for Truck drivers (NOC 7511) are large mostly because of the overall size of this occupation. In fact, its openings rate is not significantly different than the national average. Although workers in this occupational group tend to be older than the average, they also tend to retire at a later age, resulting in a retirement rate that is similar to the average rate of all occupations.
- Finally, women represented more than 50% of workers in six of these ten occupations in 2018.

The highest ratios of job openings to employment are in management and health.

Top 10 4-Digit Occupations with the Highest Ratio of Job Openings, 2019-2028

NOC	Occupations	Employment (2018)	Job Openings (2019-2028) over 2018 Employment
3011	Nursing co-ordinators and supervisors ♀	34,000	78.4%
4151	Psychologists ♀	22,500	69.4%
3112	General practitioners and family physicians ♀	75,200	67.7%
0632	Accommodation service managers	64,500	67.2%
3111	Specialist physicians	48,500	67.0%
0113*	Purchasing managers & Senior managers - health, education, social and community services and membership organizations	13,400	66.8%
0423	Managers in social, community and correctional services ♀	41,600	66.4%
0311	Managers in health care ♀	31,100	64.7%
3012	Registered nurses and registered psychiatric nurses ♀	314,300	60.8%
3120*	Optometrists, chiropractors and other health diagnosing and treating professionals ♀	33,700	58.6%

♀: Occupations where at least 50% of their workers were women in 2018.



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

To assess the size of labour demand in each occupation, the ratio of the projected number of cumulative job openings to the actual level of employment in 2018 was used. According to this indicator, all ten occupations with the largest ratios of job openings to employment are projected to be in management and healthcare occupations. This is not surprising as these occupations are expected to experience strong employment growth (expansion demand) and/or have an old workforce and a low retirement age (replacement demand).

Occupations with the smallest ratios of job openings to employment are concentrated in the primary sector, as well as in sales, services and office occupations.

Top 10 4-Digit Occupations with the Smallest Ratio of Job Openings, 2019-2028

NOC	Occupations	Employment (2018)	Job Openings (2019-2028) over 2018 Employment
8440*	Other workers in fishing and trapping and hunting occupations	4,100	-2.0%
1422*	Data entry clerks & Desktop publishing operators and related occupations ♀	34,100	1.8%
4411	Home child care providers ♀	35,200	5.6%
6521	Travel counsellors ♀	17,300	5.9%
6512	Bartenders ♀	38,500	10.6%
8260*	Fishing vessel masters and fishermen/women	11,300	10.6%
7292*	Glaziers & Insulators	14,100	11.3%
8432*	Nursery and greenhouse workers ♀	16,200	11.7%
1434*	Banking, insurance and other financial clerks & Collectors ♀	37,200	11.8%
2222*	Agricultural and fish products inspectors; Forestry technologists and technician & Conservation and fishery officers	16,100	12.6%

♀: Occupations where at least 50% of their workers were women in 2018.



Sources: Statistics Canada (historical data) and ESDC 2019 COPS Projections.

On the other hand, occupations that are expected to face the lowest ratios of job openings over the projection period are those related to fishing, agriculture, clerical and administrative fields, and sales and services. Retirement pressures for most of those occupations are low as workers are generally younger. Also, employment growth for these occupations is expected to be below average or negative, as they are heavily impacted by technology advancement among other factors.

In 2018, women accounted for more than 50% of employment in seven of the ten occupations with the largest ratios of job openings, but only in six with the lowest ratios. This is also reflected in occupations with a substantially high concentration of female employment (where at least 80% of the employment were women in 2018).

Occupations where at least 80% of workers were women in 2018 are expected to have on average higher ratios of job openings than for those where the concentration was below 20% because of relatively stronger job creation and a higher proportion of retirements.

There were 42 occupations where at least 80% workers were <u>women</u> in 2018	There were 93 occupations where at least 80% workers were <u>men</u> in 2018
Employment in these 42 occupations represented about 19.1% of total employment.	Employment in these 93 occupations represented about 23.1% of total employment.
On average, job openings in these occupations are expected to account for 37.4% of the 2018 employment over the projection period.	On average, job openings in these occupations are expected to account for 33.1% of the 2018 employment over the projection period.
14 (or 33.3%) of the 42 occupations are expected to have a job opening ratio substantially above the average. <ul style="list-style-type: none"> • 25 (or 59.6%) are expected to have a job opening ratio above the average of all occupations (35.2%). 	14 (or 15%) of the 93 occupations are expected to have a job opening ratio substantially above the average. <ul style="list-style-type: none"> • 32 (or 34.4%) are expected to have a job opening ratio above the average of all occupations (35.2%).
Of the 25 with above average job opening ratios: <ul style="list-style-type: none"> • 11 Health occupations • 6 Business, finance and administration occupations • 5 In education, law and social, community and government 	Of the 32 with above average job opening ratios: <ul style="list-style-type: none"> • 9 Trades, transport and equipment operators and related • 9 Natural and applied sciences and related occupations • 6 Occupations in manufacturing and utilities • 4 Management occupations

Sources: ESDC estimates (historical data) and ESDC 2019 COPS Projections.



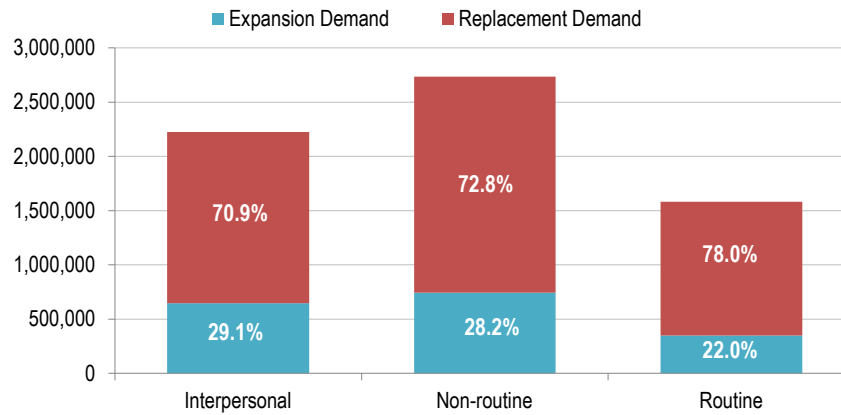
In 2018, 42 occupations had a significantly high concentration of female workers, a number lower than the 93 with a substantially elevated proportion of males.

The sum of the projected job openings of all the occupations with a significant concentration of female workers is expected to represent about 37.4% of their cumulative 2018 employment level. This is largely because 25 of these occupations (59.6%) are projected to have ratios above the average of 35.2%. The larger employment size among these occupations, the relatively stronger job creation and their generally higher proportion of retirements, explain this situation. Occupations related to health; business, finance and administration; as well as education, law and social, community and government services represent the large majority of such occupations.

In comparison, job openings will represent about 33.1% of the 2018 employment among occupations with a strong concentration of males. Only 32 (or 34.4%) of these occupations are expected to have above average job openings ratios. Occupations related to trades, transport and equipment operators, natural and applied sciences, management and manufacturing account for the majority of such occupations.

Replacement demand is projected to represent the largest share of job openings for all types of tasks.

Job Openings from Expansion and Replacement Demand by Type of Tasks, Projection 2019-2028



Source: ESDC 2019 COPS Projections.



Out of the 6.56 million projected job openings (those due to economic growth plus those due to replacement needs), a little more than 2.7 million of those job openings are expected to have a high content of non-routine tasks. About 750,000 (28.2% of them) are projected to be new positions resulting from increasing economic activity (expansion demand or employment growth), and about 2.0 million are projected to be existing positions being vacated due to replacement needs (retirements will account for 1.6 million of the 2.0 million positions being vacated).

A little more than 2.2 million of the job openings are expected to have a high content of interpersonal tasks. This type of tasks will have the highest share of job openings resulting from expansion demand (or employment growth), accounting for a little less than 650,000 openings (29.1%). The need to replace some 1.6 million existing positions will still represent about 70% of job openings (of which 1.25 million will be from retirements).

Occupations with overall high shares of interpersonal and non-routine cognitive tasks are expected to have the largest proportion of job openings.

Finally, occupations with a high content of routine tasks are expected to account for about 1.6 million of job openings. A little more than three-quarters of those openings will come from replacement needs (about 1.25 million, of which, 1 million are from retirements), while the remaining 350,000 openings are projected to be new positions as a result of increasing economic activity.