

THE IMPACT OF AI-POWERED TOOLS ON LABOUR MARKET

The Impact of AI-Powered Tools on the Labor Market and Employment in Canada

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Abstract: Artificial Intelligence (AI) is a groundbreaking technology that empowers computer systems to perform tasks that traditionally relied on human intelligence. This transformative capability has sparked discussions about its potential impact on employment and the labor market. We found that, based on 5-digit NOC, the top 10 highly AI-exposed occupations are financial managers, business development officers and market researchers and analysts, banking and other investment managers, securities manager, trust officers, accountants, investment analysts, notaries public, financial auditors, lawyers and Quebec notaries in Canada. Considering the training and education, 15% Canadian occupations typically require a university degree, of which 70% of them are highly exposed to AI. Considering the broad occupational category, our findings also reveal that over 90% of occupations in "Business, finance, and administration occupations" and "Legislative and senior management occupations" are highly exposed to AI all of which employ of total 5,266,400 individuals in Canada. The highest exposed occupational category is "Business, finance, and administration occupations" with a 16.28% employment rate to a total of 3,284,000 employed people in Canada.

Keywords: ChatGPT, artificial intelligence, technology, labor market, employment, occupations, workforce, NOC

Introduction

Artificial Intelligence (AI) rapid advancements technology, particularly rooted in Machine Learning and Generative AI, has had significant impact or seemed to have significant impacts on various industries and business, from the way in which they communicate, sell, operate, or carry out the activities. Therefore, this has initiated conversation around the potential impact on employment and labor market. This research outcomes will allow individuals and businesses to recognize the necessity of gaining the required skills to adapt to the changes, and it also will enable policymakers to understand the impact of the AI on the Canadian labor market to make well-informed decisions.

To investigate this impact in Canada, we adopted the methodology by Felton et al. (2023) and leveraged the Canadian National Occupational Classification (NOC) and the OaSIS databases. Our analysis demonstrates the extent of AI's influence on the Canadian workforce and its 900 distinct occupations based on 5-digit NOC system. In this way, we construct a comprehensive list, spotlighting the occupations most susceptible to AI exposure. Furthermore, we developed a detailed examination of the aggregated findings, exploring Training & Education dynamics of the Canadian NOC (National Occupational Classification) and its 10 Broad Occupational categories to investigate the impact of the AI-powered tools. AI-exposure by occupation results is highly correlated to the results by Felton et al. (2023) showing robustness of our findings. Occupations with high exposure to AI may mean that it can be highly augmented or replaced, and this depends on the particular characteristics of each occupation; an example of this is the creative industries occupations such as content writers, film editors, and composers, which could be seen forced to augment their skills with these technologies.

Literature Review

Artificial intelligence, as a distinct scientific field emerging from cybernetics in the late 1950s, during World War 1, set the stage for technologies capable of performing tasks that require a deeper degree of analysis (Abuselidze & Mamaladze, 2021; Mutascu, 2021). At its core, AI encompasses the development of computer systems that can perform tasks that previously needed human intelligence (Cutean et al., 2019), including reasoning, problem-solving and judgment skills.

Artificial Intelligence (AI) is also a transformative technology in which its systems function as machine-based entities that predict, recommend, and decide, impacting real or virtual environments (Lane & Saint-Martin, 2021). They use human-machine inputs, abstract perceptions into models (often via machine learning), and offer actionable choices, adapting autonomously to diverse contexts. Moreover, AI systems have the power to impact their surroundings by employing data-driven decision-making and automated processes (White House & European Commission, 2022; Lane & Saint-Martin, 2021; Briciu & Briciu, 2021). A comprehensive view of AI's scope is offered by Abuselidze & Mamaladze's analysis (2021), in which human intelligent problem-solving and machine-autonomous tasks are compared, remarking that in some cases, human capabilities have been surpassed by machine execution (Abuselidze & Mamaladze, 2021; Ngotngamwong, 2020).

The advent of AI, representing a new class of machines capable of tasks previously exclusive to humans (Mutascu, 2021), marks a significant departure from traditional technological patterns (Su et al., 2021). The synergy between AI and automation has impacted and reshaped tasks and labor dynamics, including fields such as

medicine, finance, and information technology (Frank et al., 2019). The effects of this synergy are observed not only in emerging sectors like biotechnology, advanced manufacturing, clean technology, and interactive media but also in traditional industries such as food and agriculture (Cutean et al., 2019).

Deloitte (2017) examined the "Intelligence Revolution" in Canada; this movement is based on advancements in machine learning, data storage, and computational power. Within the AI landscape, machine learning emerges as a transformative force that allows machines to solve problems by trial and error that, when accompanied by a robotic process, replaces repetitive human tasks, which is called Robotic Process Automation (RPA) (Deloitte, 2017). The AI revolution unfolds against the backdrop of concerns about displacement and unemployment (Makridakis, 2017; Frank et al., 2019). In the 4th industrial revolution context, AI is expected to polarize jobs into winners and losers, shifting the relative demands in the job market (Abuselidze & Mamaladze, 2021). Autor et al. (2022) assure that in the last 40 years, the demand-eroding effects of automation have been more significant than the rise of new jobs demand; however, AI can also work by augmenting human labor by synergizing AI and other technologies (Autor et al., 2022; Hatzius et al., 2023).

Human and artificial intelligence fusion is a powerful dynamic, leading to improved organizational efficiency (Ngotngamwong, 2020); for this reason, AI can augment human labor and amplify productivity; this is why it is an attractive and relevant technology for organizations (Strack, 2021; Autor et al., 2022; Deloitte, 2017; Autor, 2022). This has caused large companies to start incorporating this technology into their processes; in this sense, Deloitte's (2017) Human Capital Trends report found that 41

percent of companies have already fully implemented or made significant progress in adopting cognitive and AI technologies in their workforce.

The figures of these companies incorporating artificial intelligence technology into their processes raise concerns about the potential impact that this may have on the labor market. On the one hand, due to the nature of technology, it can be expected that the augmentation empowers workers to elevate their quality outputs and creates new demands for specialized expertise and human enhancement technologies (Autor et al. 2022; Deloitte, 2017). However, the effect of automation on employment is not completely clear and could range from 9% to more than 50%, depending on methodology and country (Frank et al., 2019). Nonetheless, Frank et al. (2019) remarked that not always concerns around automation have materialized in widespread unemployment.

Most of the current occupations were consolidated after 1940, and over the last 80 years, new occupations have constantly appeared to meet the businesses' needs. Initially, most 'new jobs' were around middle-paid production and clerical occupations; later, this "new jobs" category shifted to high-paid professionals and, secondarily, low-paid services since 1980 (Autor et al., 2022). Augmentation is heavily linked to new task creation; however, it does not predict where the new work will be (Autor et al., 2022). In this context, it seems that repetitive tasks will be managed by computers while elements based on judgment will be conducted by humans (Deloitte, 2017). These new technologies are expected to eliminate, change and create new jobs that will require a focus on diverse soft skills such as empathy, leadership and global awareness (Briciu & Briciu, 2021). Frank et al. (2019) refers to this process as the 'creative destruction' in which new industries and jobs are developed based on technological advancements.

Recent research in the United States has shown how some occupations are more exposed to artificial intelligence than others. Hatzius et al. (2023), in their research for Goldman Sachs, entitled "The Potentially Large Effects of Artificial Intelligence on Economic Growth," found that two-thirds of occupations in the United States are exposed to AI automation at different levels ranging from 25% to 30% of the workload with a chance to be replaced. Another of their findings was that they estimated that one-fourth of work tasks could be automated by AI in the United States, identifying administrative and legal occupations as the ones that could have the greatest exposure. In the same line, the research titled "How will Language Modelers like ChatGPT Affect Occupations and Industries" by Felten et al. (2023) also found that other occupations, such as telemarketers and a wide variety of post-secondary, also had high exposure to AI, suggesting that these occupations could be augmented or replaced, depending on each occupation. Felten et al. He added that among the industries with the greatest exposure are securities, commodities, investments, and legal services.

In the context of Canada, it is noteworthy to observe that nations characterized by high levels of automation tend to exhibit low unemployment rates (Manyika et al., 2017). Moreover, advanced economies often encounter a situation where the scarcity of automation becomes more pronounced than the excess of it (Felten et al., 2023), leading to the consideration that the challenge lies more in the deficiency of automation rather than an excess of it. The 2020 pandemic has speeded up the embrace of AI technologies, highlighting the urgency of developing a proficient workforce. Canada's digital workforce can be bolstered through upskilling initiatives and cross-training programs. Such endeavors hold the potential to unlock fresh employment prospects and novel career

trajectories for workers (Hamoni et al., 2021). Additionally, workers born outside the country represent a vital source for Canada's digital economy (Cutean et al., 2019). According to The Information and Communications Technology Council (ICTC) 2019 report, the demand for digitally skilled workers is expected to reach more than 300,000, leading to 2.1 million people employed in the digital economy (Cutean et al., 2019); to put this in perspective, the number of workers is close to half of New Zealand population.

To be sustained in the long term, the development of digital workers in Canada should not solely focus on technical skills; instead, it should also be focused in terms of sustainable capabilities that are portable and transferable between many occupations, such as collaboration, adaptability, and conceptual thinking, talents that AI cannot compete in foreseeable future (Deloitte, 2017; Frank et al., 2019).

Since automation, artificial intelligence and technology have a great impact on organizations, their productivity and their processes, it causes great uncertainty knowing how these advances will affect the labor market around the world, especially in advanced countries who are expected to implement these technologies first. In this sense, Acemoglu & Autor (2011) ensure that middle-skilled employees, both at a cognitive and manual work level, are some of those who can be replaced, such as bookkeeping or monitoring jobs, due to their functions they can be codified and programmed to be made by a computer (Acemoglu & Autor, 2011). Although the above can mean an unfavourable impact for the labor market, according to Manyika et al. (2017), not everything is negative, since the other side of the coin is that it can also have a positive impact on productivity, since those employees who rely on technology may be more efficient (Acemoglu & Restrepo, 2020). Autor et al. (2022) confirm both effects on the

labor market, assuring that technological advances increase the demand for new jobs that may not even exist yet, but they also warn of the depression of current jobs that can be replaced due to their high exposure (Autor et al., 2022).

The effects of technology have not been analyzed by researchers only in the United States; other countries have also focused their studies on knowing how artificial intelligence and automation can affect the labor market. According to Zhou et al., (2020), the replacement of employees in China by AI affects women more than men, likewise it increases in the population with lower income, less education and increases from 41 years of age (Zhou et al., 2020). Regarding the opening of new jobs, in Europe there has been an increase in the demand for AI-related labor, who also receive 3% higher wages compared to non-AI employees (Nestor et al. ,2022). These results also extend to other countries such as France, where it was also found that uneducated employees are more affected by automation than educated workers. As per Hatzius et al. (2023) two-thirds of US occupations of which forms 25-50% of the workload are at high risk to be replaced by AI.

In the case of Canada, the impact that automation can have on the labor market has also been confirmed. This automation includes repetitive and routine tasks that can be coded and programmed on a computer. This technology puts at risk about 10.6% of Canadian workers who have a high probability of being replaced by automation (Frenette & Frank, 2020; Frenette & Frank, 2020). Considering artificial intelligence such as those present in new technologies such as GPT Chat, an increase in the demand for digitally skilled workers is expected (Cutean et al., 2019), also increasing the potential earnings in certain professions related to technology (Hermus & Sopchokchai, 2022).

These investigations focus on the impact of automation; however, the strong arrival of artificial intelligence, thanks to the launch of Chat GPT by Open AI, has focused on how this technology and others associated with artificial intelligence will impact the Canadian labor market. Previous research shows that this technology will promote the automation of more than 300 million jobs worldwide, increasing productivity, reflected in an annual increase of 7% of GDP in the next ten years (Acemoglu et al., 2020). This research focuses on analyzing the potential impact of artificial intelligence on the Canadian labor market, measuring the level of exposure of occupations to AI and identifying the occupations with the highest exposure to this technology and the industries to which these occupations belong.

Methodology

The primary objective of this methodology is to gain a comprehensive understanding of the exposure of Canadian jobs to AI-powered tools like ChatGPT; the exposure refers to the potential impact that the AI can have on the occupations, which may result in substitution or augmentation depending on occupational traits such as task complexity, automation potential and data availability. To achieve this objective, we use a methodology that combines human data and AI capabilities to assess the level of AI involvement in various occupations within Canada.

Our methodology is built upon the foundation established by Felton et al. in their 2023 article titled "How will Language Modelers like ChatGPT Affect Occupations and Industries?" This article is also the base paper for this research and provides valuable insights into the implications of AI on occupations and industries, serving as a starting point for our own analysis.

Felton et al. (2023) uses the data from the Occupational Information Network (O*NET) by the United States Department of Labor database. O*NET provides details about 900+ occupations covering work units such as 'work activities,' 'abilities,' and 'skills.' In Felton et al. (2023) article, 52 human abilities are weighted by "prevalence" and "importance" to describe O*NET occupations (United States Department of Labor, n.d.).

Data Sources

To gather information about the human workforce in Canada, we rely on the Occupational and Skills Information System (OaSIS) database. This database contains information on 900 different job occupations in Canada according to the last modification made on August 1, 2023, classified using the National Occupational Classification (NOC) system 2021 Version 1.0, which shows a 5-digit hierarchical structure in its classification (Government of Canada, 2023). Later, this version was disaggregated from 516 NOC unit groups to 900 7-digit occupational profiles. For this research, this expanded version of the 7-digit was used. Each occupation is associated with a set of 49 abilities, ranging from skills such as information ordering and numerical ability to attributes like night vision and body flexibility. Notably, OaSIS provides a complexity level (Proficiency) for each ability, graded on a scale of 1 to 5.

To connect abilities in each occupation to AI applications, we rely on Felton et al. (2023) article, which provides the result of their crowd-sourced matrix that assesses how AI applications are associated to human abilities. The original support article linked 10 AI applications based on Electronic Frontier Foundation (EFF) data to the 52 O*NET human abilities and then ability AI exposure rate is calculated using the crowd-sourced

matrix. The values from this matrix (ability AI exposure rate) are used as weights (A) in our basic calculations are displayed in Table 01.

Ability Exposure Matching

Despite the similarities between OaSIS (Canada database) and O*NET (US database), there are minor differences in the numbers, names and definitions of the abilities in these datasets. To be able to use AI ability exposure rate in Felton et al. (2023) article, a precise matching of the O*NET abilities with OaSIS abilities was done. According to the database, O*NET has 52 abilities (Onet Online, n.d.), while OaSIS has 49 abilities (Government of Canada, n.d.). To perform the matching, first of all, the abilities that had the same name in both databases were matched, confirming through their definitions that they referred to the same ability. Then, the abilities definitions that refer to the same process were carefully checked for abilities with different names. like Time Sharing (O*NET) and Multitasking (OaSIS). During this stage of the matching process, it was found that Canada groups certain abilities, such as Oral Comprehension and Oral Expression, in O*NET, which is grouped into a single ability called Verbal Ability in OaSIS. The same applies to the Dynamic Flexibility and Extent Flexibility abilities in O*NET, which are grouped into the OaSIS Body Flexibility ability according to their definitions. Finally, the ability of Originality was found in O*NET, which was not considered for this analysis since a similar ability was not found in OaSIS Canada. Since the 49 OaSIS Canada skills were found and matched with the O*NET abilities, the decision to exclude the Originality ability does not affect or compromise the results obtained (see appendix 1).

Table 01

Occupation Exposure Score by Ability for OaSIS Canada adopted from Felton et al.

(2023) after matching

Abilities Canada	AI Exposure Score
Information Ordering	1.908
Memorizing	1.686
Patter Organization speed	1.377
Pattern Identification	1.36
Categorization Flexibility	1.276
Perceptual Speed	1.24
Selective Attention	1.151
Deductive Reasoning	1.04
Speech Recognition	0.972
Inductive Reasoning	0.964
Multitasking	0.67
Auditory Attention	0.66
Verbal Ability	0.61
Speech Clarity	0.568
Written Comprehension	0.563
Problem Identification	0.538
Mathematical Reasoning	0.486
Numerical Ability	0.483
Written Expression	0.458
Spatial Visualization	0.449
Multi-signal response	0.437
Hearing Sensitivity	0.434
Colour Perception	0.415
Fluency of Ideas	0.401
Spatial Orientation	0.375
Sound Localization	0.317
Near Vision	0.15

Reaction Time	0.117
Depth Perception	0.067
Control of Settings	0.032
Rate Control	-0.135
Far Vision	-0.197
Glare Tolerance	-0.287
Peripheral Vision	-0.33
Night Vision	-0.377
Finger Dexterity	-0.907
Finger-Hand-Wrist Motion	-1.051
Manual Dexterity	-1.053
Arm-Hand Steadiness	-1.125
Multi-Limb Coordination	-1.151
Speed of Limb Movement	-1.302
Gross Body Coordination	-1.355
Gross Body Equilibrium	-1.417
Body Flexibility	-1.505
Stamina	-1.514
Static Strength	-1.562
Dynamic Strength	-1.582
Explosive Strength	-1.599
Trunk Strength	-1.721

Note. Crowd-sourced matrix AI exposure Score. Adapt from *How will Language*

Modelers like ChatGPT Affect Occupations and Industries? - Felten et al. 2023.

<https://doi.org/10.48550/arXiv.2303.01157>

Exposure Calculation

Our methodology involves calculating the **Occupation Exposure (OE)** score for each occupation. This score is computed by summing the abilities of each occupation, weighted by their respective exposure to AI applications. Mathematically, the OE score is

determined by dividing the sum of abilities weighted by their AI exposure by the total sum of abilities. The formula can be expressed as follows:

$$OE_k = \frac{\sum_{j=1}^{49} A_{ij} \cdot C_{ij} \cdot I_{ij}}{\sum_{j=1}^{49} C_{ij} \cdot I_{ij}}$$

In the equation, A_{ij} refers to the exposure level of abilities obtained from Felton et al. (2023) using crowd source matrix. This data is first obtained by adopting the results of the AI Occupational Exposure (AIOE) measure from Felten et al. (2023), which was then compared through a matching process to the abilities of OaSIS Canada (See table 01 and appendix 1). On the other hand, C_{ij} refers to the complexity level of each ability in tech occupation on a 1 to 5 scale. Lastly, I_{ij} refers to the level of importance. Due to the lack of available data of the importance of each ability in Oasis, we assume $I_{ij} = 1$ for simplicity. This assumption did not have significant impact on the results when compared to the findings of Felton et al. (2023) therefore it is not a heavy assumption in our studies. The correlation test results attest to the claim.

Data Analysis and Results

Top AI exposed Occupations

As a result of this research, the occupational exposure score was found for each of the 900 occupations according to the Occupational and Skills Information System (OaSIS) of Canada (See Appendix 2). This exposure was located between a range of - 0.401 and 0.882

Table 02 shows the 20 occupations with the highest exposure level with the broad occupational category to which they belong, according to the OaSIS database. Of these

20 occupations, 11 are from the Business, finance and administration categories.

Likewise, six belong to the category of Occupations in education, law and social, community and government services, and finally, three belong to the category of Legislative and senior management occupations.

Table 02

Top 20 occupations with higher rates

Code	OaSIS Occupations	Broad occupational category	OE
10010.00	Financial managers	Business, finance and administration occupations	0.882
41402.00	Business development officers and market researchers and analysts	Occupations in education, law and social, community and government services	0.877
10021.01	Banking and other investment managers	Business, finance and administration occupations	0.877
10020.04	Securities manager	Business, finance and administration occupations	0.868
11109.04	Trust officers	Business, finance and administration occupations	0.867
11100.02	Accountants	Business, finance and administration occupations	0.866
11101.02	Investment analysts	Business, finance and administration occupations	0.860
42200.03	Notaries public	Occupations in education, law and social, community and government services	0.858
11100.01	Financial auditors	Business, finance and administration occupations	0.857
41101.00	Lawyers and Quebec notaries	Occupations in education, law and social, community and government services	0.857
00012.00	Senior managers - financial, communications and other business services	Legislative and senior management occupations	0.849
10011.00	Human resources managers	Business, finance and administration occupations	0.846

42200.05	Justice of the peace	Occupations in education, law and social, community and government services	0.846
00013.00	Senior managers - health, education, social and community services and membership organizations	Legislative and senior management occupations	0.844
00014.00	Senior managers - trade, broadcasting and other services	Legislative and senior management occupations	0.842
41100.00	Judges	Occupations in education, law and social, community and government services	0.840
42200.04	Trademark agents	Occupations in education, law and social, community and government services	0.832
11109.01	Financial examiners and inspectors	Business, finance and administration occupations	0.830
10022.04	E-business managers	Business, finance and administration occupations	0.829
11101.01	Financial analysts	Business, finance and administration occupations	0.828

It is important to highlight that the occupational exposure score implies the level at which an occupation can be augmented or substituted thanks to artificial intelligence and that the fact that one of the two actions occurs will depend on other factors directly related to each occupation. In this sense, occupations such as Human Resources Manager could be at risk of being substituted by AI due to the use of new technologies that streamline decision-making processes or, on the contrary, could be augmented by incorporating other AI technologies that help improve efficiency.

For further analysis, all 900 occupations were divided into three categories based on the exposure rankings: High exposure, medium exposure, and low exposure. The high exposure category includes occupations with scores between 0.412 and 0.882; medium

exposure category has occupations scored between 0.016 and 0.409 and finally, the low exposure occupations score has ranges between -0.401 and 0.015.

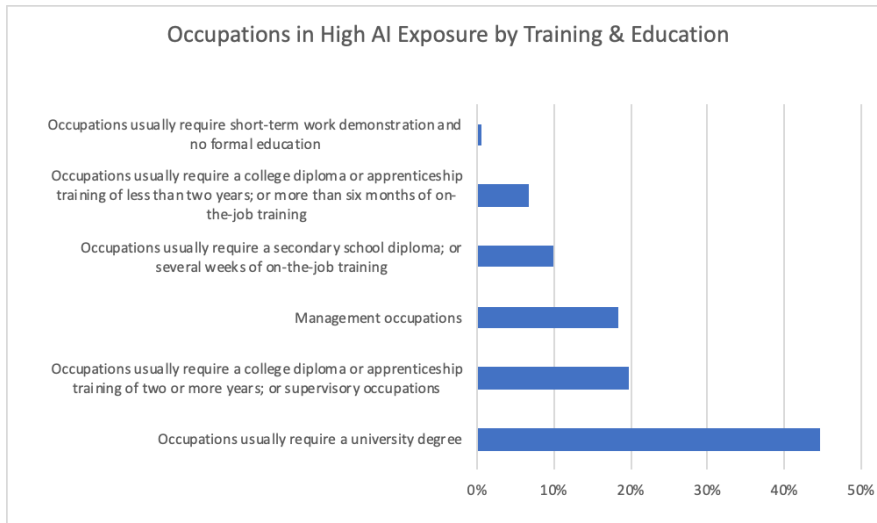
We differentiate exposure from impact in our research. Our results and findings show that all occupations are exposed to AI-powered tools. However, the degree to which each occupation is exposed will be different. Therefore, we call the difference of level of exposure as an impact from high to medium to low. On other words, the occupational exposure score implies the level at which an occupation can be augmented or substituted by AI-powered tools. The level of impact can vary depending on each occupation's particular characteristics.

Training & Education

The government of Canada's National Occupational System NOC and the database OaSIS provide data to observe which level of education or training required for each of its 900 occupations. To analyze the impact of AI on occupations through the lens of Training and Education. Our analysis reveals those occupations in the category "Occupations usually require a university degree," including roles like "market researchers, and accountants" is the most relevant category featured in the group with 'High exposure to AI.' Remarkably, this group constitutes a substantial portion of Canada's occupations, accounting for 45% of all occupations in High exposing to AI and 21% of the total 900 OaSIS (Occupations and Skills in the Service Sector) occupations (see figure 01).

Figure 01

Canadian Occupations in High Occupation Exposure by Training & Education



Note. The "High AI Exposure" category includes occupations that are particularly susceptible to AI advancements, as determined by our analysis. The data presented in this figure is based on the National Occupational Classification (NOC) Canada and OaSIS databases.

Broad occupational category

Analyzing the broad occupational category NOC in Canada (10 categories, see table 04) helps us understand the highly exposed occupations in broader category. As shown in Table 04, NOC's first digit refers to these broad occupational categories. These ten categories represent the industry of employment or field of study needed to enter an occupation (Employment and Social Development, 2023b).

Table 03

Broad Occupation Categories and Employment in Canada 2023 (x1,000)

10 broad occupational categories	Employed
0 – Legislative and senior management occupations	1,982.40
1 – Business, finance and administration occupations	3,284.00
2 – Natural and applied sciences and related occupations	1,776.30

3 – Health occupations	1,560.10
4 – Occupations in education, law and social, community and government services	2,311.80
5 – Occupations in art, culture, recreation and sport	690.9
6 – Sales and service occupations	4,395.00
7 – Trades, transport and equipment operators and related occupations	2,964.30
8 – Natural resources, agriculture and related production occupations	353.5
9 – Occupations in manufacturing and utilities	848.1

Note. Broad Occupations in Canada and its employment. Adapted from *Labor force*

characteristics by occupation, monthly, unadjusted for seasonality, inactive.

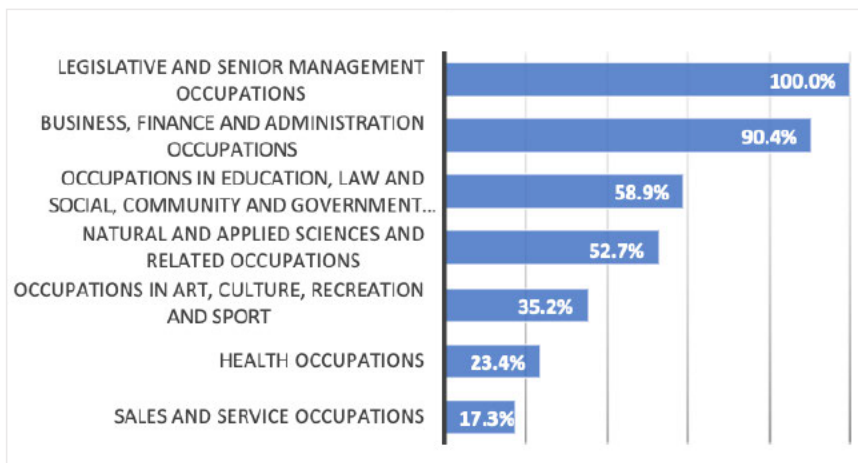
<https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=1410029601> by Government of Canada, Statistics Canada by Government of Canada, Statistics Canada.

Our findings reveal that 100% of occupations in "Legislative and senior management occupations", over 90% of occupations in "Business, finance, and administration occupations", and 58.2% of occupations in "Occupations in education, law and social, community and government services" are highly exposed to AI (see figure 02). Regardless of the level of AI exposure, these 3 categories employ of total 7,578,200 individuals in Canada (Government of Canada, Statistics Canada, 2023). High exposure rate in "Business, finance, and administration occupations" concerns financial and business, administrative and regulatory, and clerical supervision and support services (Employment and Social Development, 2023b), it currently employs 16% of Canadian workforce to a total of 3,284,000 (Government of Canada, Statistics Canada, 2023). "Business, finance, and administration occupations" is the most significant category in high exposure in total volume, embracing 85 occupations. In this category, financial manager has the highest AI exposure, at the top position in this analysis rank, and employment of 74,900 in 2021 (Canada, 2023b).

Notably, according to Statistics Canada (2023), Sales and service occupations are the broad occupational with the highest volume of workers responding for 21.4% of 20,166,400 total workers in Canada as July 2023 (Government of Canada, Statistics Canada, 2023). This analysis shows that 82.7% of occupations in this broad category are in low or moderate exposure to AI, and only 19 of its 110 OaSIS occupations are highly exposed to AI. "Insurance agents and brokers" is the highest rated occupation, placed on the top 23, and employment of 90,200 in 2021 (Canada, 2023).

Figure 02

Percentage of Broad Category in High Occupation Exposure



Note. Business, finance, and administration occupations present high exposure to AI as determined by our analysis. The data presented in this figure is based on the National Occupational Classification (NOC) Canada and OaSIS databases.

Correlation test of occupation exposure of our findings for Canada with findings of Felton for USA

Felton's methodology manages O*NET information to understand the extent to which occupations in the US are exposed to AI, such as ChatGPT. In this article, we worked on the Canadian database OaSIS to assess this effect on Canada's workforce. Due to differences in how data is presented in both databases and lack of data of importance level of occupations in OaSIS, we assumed the importance level of occupations is "1" for all occupations in Canada.

Despite the importance level assumption for occupations in Canada, the OE measure of occupation in this study is highly correlated with Felton et al. (2023) AIOE index. In this sense, the correlation analysis using the Pearson and Spearman method presents coefficients $r = 0.888$ and $\rho = 0.883$ close to 1. Both methods state that coefficients near 1 indicate a strong positive relationship, implying that as exposure increases in occupations in the US, it also increases for similar occupations in Canada. Figure 03 shows the strong linear relationship of both measures, which indicates that the list of exposed occupations in Felton et al. (2023) is highly correlated with the exposed occupations in this research. Furthermore, our results find resonance within the broader literature, notably aligning with research such as Goldman Sachs' report (2023). This convergence across multiple sources underscores the validity of our findings. However, considering the fast pace of changes and revolutions in AI and the effects of AI on workforce, there is a need for continuous research and updates on the approaches, analysis, and measurements.

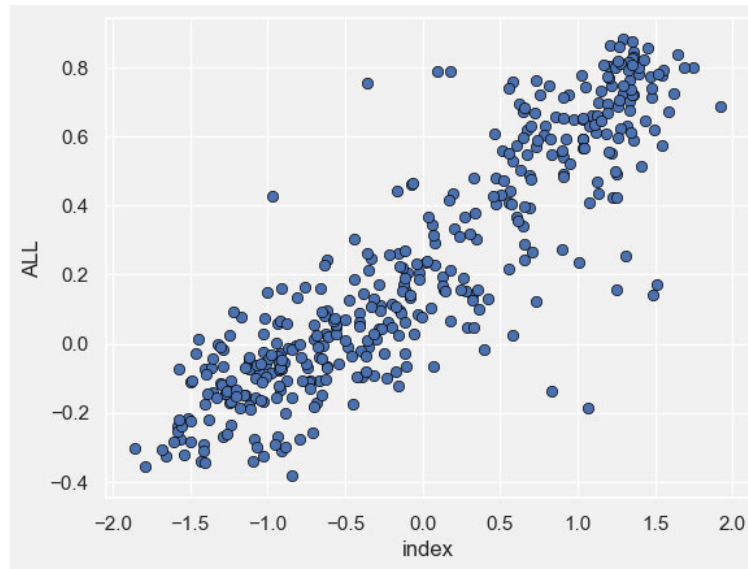
Table 05

Correlation Values

Method	Coefficient	Value
Pearson	r	0.888
Spearman	rho	0.883

Figure 03

Occupation Correlation Analysis



Note. This scatterplot highlights the linear correlation between Felton's article and our analysis.

It is worth nothing that there are other methodologies to analyze the correlation and associations such as Covariance, and Regression analysis. However, we used the simple and common method to test this correlation. If time allowed, we could also use other methodologies.

Limitations

Given the availability of the relevant data, imposed assumptions, and high correlation and consistency of our findings, still there are limitations in this research that requires to be discussed. The following are limitations of this research, and we hope this

will shed light for the future scholars and researchers working on this field and create potential future research opportunities to overcome the current challenges and limitations. At first, matching occupations from the US O*NET and Canada OaSIS databases posed some challenges due to the differences in categorizing occupations. These two databases use different classification systems, which make difficult one-to-one matches. For instance, occupations may be similar in tasks and responsibilities but present different titles or descriptions. There are also differences in granularity because some occupations in one database are divided into subcategories while their counterparts in the other database are not. In addition to what was said, Felton's 2021 article only ranked 700 of 1016 O*NET occupations.

A second limitation encountered during the analysis of occupations using the Canada OaSIS database was the absence of data detailing the importance of specific abilities within each occupation. That is to say, OaSIS does not provide a ranking or weighting of abilities based on their importance to the effective performance of specific job roles. This paper uses the value one for importance of all abilities.

A third challenge to the analysis of labor market dynamics is the limited availability of employment public data at 5-digit NOC level due to confidentiality of data at this level. To access the needed data, the request for access to this confidential data should be made which requires going through a time-consuming process. This was not feasible for our research given the limited time span we had.

A fourth limitation was the limited information about AI applications that Felton et al. (2023) used for exposure calculations. AI applications continue to change rapidly;

therefore, Occupation Exposure could change if these new applications are considered, resulting in more accurate and up-to-date results.

Conclusions

This paper has adapted Felton's methodology to Canada's case to assess the impact of AI on workforce occupations. Despite the challenges to matching US and Canada data and the absence of important parameters for abilities, we found a significant positive correlation between this paper list and Felton et al. (2023) result. We also found that occupations that require a university degree are currently highly exposed to AI and that the broad occupation "Business, finance, and administration occupations" has the greatest group of occupations with High exposure to AI. Similarly, occupations with high exposure to AI also encompass occupations in the legal and professional services sector. The level of AI exposure within an occupation suggests the potential for augmentation or replacement, contingent upon the unique attributes of each profession. Further investigations using data from the occupational level are needed to explore deep aspects of employment and AI. The research results will allow individuals and businesses to identify and recognize the necessity of gaining the required skills to adapt to the changes, and it also will enable policymakers to understand the impact of the AI technologies on the Canadian labor market to make well-informed decisions.

Overall, this research aims to contribute to the studies of AI impact on the workforce, focusing on the Canadian work environment. This analysis produced relevant data for organizations in different industries and individuals.

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Appendix

Appendix 1

Abilities matched from ONET to OASIS. The matching table to be written with definitions of each ability for both ONET and OASIS

Abilities ONET (52)		Abilities Oasis (49)	
Description	Abilities	Abilities	Description
The ability to keep your hand and arm steady while moving your arm or while holding your arm and hand in one position.	Arm-Hand Steadiness	Arm-Hand Steadiness	The ability to keep your hand and arm steady while moving or holding them in one position.
The ability to focus on a single source of sound in the presence of other distracting sounds.	Auditory Attention	Auditory Attention	The ability to give full attention on a single source of sound in the presence of other distracting sounds.
The ability to generate or use different sets of rules for combining or grouping things in different ways.	Category Flexibility	Categorization Flexibility	The ability to generate or use different sets of rules for combining or grouping things in different ways.
The ability to apply general rules to specific problems to produce answers that make sense.	Deductive Reasoning	Deductive Reasoning	The ability to apply general rules to produce logical answers for specific problems.
The ability to judge which of several objects is closer or farther away from you, or to judge the distance between you and an object.	Depth Perception	Depth Perception	The ability to discern which of several objects is closer or farther away from you, or to estimate the distance between you and an object.
The ability to exert muscle force repeatedly or continuously over time. This involves muscular endurance and resistance to muscle fatigue.	Dynamic Strength	Dynamic Strength	The ability to exert muscle force repeatedly or continuously over time. This involves muscular endurance and resistance to muscle fatigue.
The ability to use short bursts of muscle force to propel oneself (as in jumping or sprinting), or to throw an object.	Explosive Strength	Explosive Strength	The ability to exert short bursts of muscle force to propel oneself (as in jumping or sprinting), to

			throw an object, or to apply force with a tool.
The ability to see details at a distance.	Far Vision	Far Vision	The ability to see details of objects and people at a distance.
The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.	Finger Dexterity	Finger Dexterity	The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble small objects.
The ability to come up with a number of ideas about a topic (the number of ideas is important, not their quality, correctness, or creativity).	Fluency of Ideas	Fluency of Ideas	The ability to come up with multiple ideas about a topic.
The ability to see objects in the presence of a glare or bright lighting.	Glare Sensitivity	Glare Tolerance	The ability to see objects or people, in the presence of glare or bright lighting.
The ability to coordinate the movement of your arms, legs, and torso together when the whole body is in motion.	Gross Body Coordination	Gross Body Coordination	The ability to coordinate the movement of your arms, legs, and torso together when the whole body is in motion.
The ability to keep or regain your body balance or stay upright when in an unstable position.	Gross Body Equilibrium	Gross Body Equilibrium	The ability to keep or regain your body balance or stay upright when in an unstable position.
The ability to detect or tell the differences between sounds that vary in pitch and loudness.	Hearing Sensitivity	Hearing Sensitivity	The ability to detect or distinguish the differences between sounds in terms of pitch and volume.
The ability to combine pieces of information to form general rules or conclusions (includes finding a relationship among seemingly unrelated events).	Inductive Reasoning	Inductive Reasoning	The ability to combine pieces of information to form general rules or conclusions, which includes finding a relationship among seemingly unrelated events.

The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).	Information Ordering	Information Ordering	The ability to arrange things or actions in a certain order or pattern according to a specific rule or set of rules (e.g., patterns of numbers, letters, words, pictures, mathematical operations).
The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.	Manual Dexterity	Manual Dexterity	The ability to move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects or tools.
The ability to choose the right mathematical methods or formulas to solve a problem.	Mathematical Reasoning	Mathematical Reasoning	The ability to choose the right mathematical methods or formulas to solve a problem.
The ability to remember information such as words, numbers, pictures, and procedures.	Memorization	Memorizing	The ability to remember information such as words, numbers, pictures, or procedures.
The ability to coordinate two or more limbs (for example, two arms, two legs, or one leg and one arm) while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.	Multilimb Coordination	Multi-Limb Coordination	The ability to coordinate two or more limbs, such as two arms, two legs, or one leg and one arm, while sitting, standing, or lying down. It does not involve performing the activities while the whole body is in motion.
The ability to see details at close range (within a few feet of the observer).	Near Vision	Near Vision	The ability to see details at close range.
The ability to see under low-light conditions.	Night Vision	Night Vision	The ability to see under low light conditions.
The ability to add, subtract, multiply, or divide quickly and correctly.	Number Facility	Numerical Ability	The ability to carry out arithmetical processes accurately such as addition, subtraction, multiplication or division.

The ability to listen to and understand information and ideas presented through spoken words and sentences.	Oral Comprehension	Verbal Ability	The ability to understand the meaning, precise use, associated ideas, and relationships of spoken words; and to use them in the proper context when presenting information or ideas.
The ability to communicate information and ideas in speaking so others will understand.	Oral Expression		
The ability to quickly and accurately compare similarities and differences among sets of letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time or one after the other. This ability also includes comparing a presented object with a remembered object.	Perceptual Speed	Perceptual Speed	The ability to compare, quickly and accurately, similarities and differences among sets of letters, numbers, objects, pictures, or patterns. The things to be compared may be presented at the same time, one after the other, or with a remembered object.
The ability to see objects or movement of objects to one's side when the eyes are looking ahead.	Peripheral Vision	Peripheral Vision	The ability to see objects, people, or their movement in the peripheral field of vision when looking ahead.
The ability to tell when something is wrong or is likely to go wrong. It does not involve solving the problem, only recognizing that there is a problem.	Problem Sensitivity	Problem Identification	The ability to identify an existing or potential problem. It is not about solving the problem, but only about recognizing its presence.
The ability to time your movements or the movement of a piece of equipment in anticipation of changes in the speed and/or direction of a moving object or scene.	Rate Control	Rate Control	The ability to time your movements or the movement of a piece of equipment in anticipation of changes in the speed and/or direction of a moving object.
The ability to quickly respond (with the hand, finger, or foot) to a signal (sound, light, picture) when it appears.	Reaction Time	Reaction Time	The ability to respond quickly with one or more limbs to a stimulus such as noise, light or image.

The ability to concentrate on a task over a period of time without being distracted.	Selective Attention	Selective Attention	The ability to concentrate on a task over a period of time without being distracted.
The ability to tell the direction from which a sound originated.	Sound Localization	Sound Localization	The ability to identify the direction, origin and distance from which a sound comes.
The ability to know your location in relation to the environment or to know where other objects are in relation to you.	Spatial Orientation	Spatial Orientation	The ability to know your location in relation to the environment or know where objects are in relation to you.
The ability to speak clearly so others can understand you.	Speech Clarity	Speech Clarity	The ability to articulate and pronounce words clearly, so others can understand you when you speak.
The ability to identify and understand the speech of another person.	Speech Recognition	Speech Recognition	The ability to identify and understand the speech of another person.
The ability to quickly move the arms and legs.	Speed of Limb Movement	Speed of Limb Movement	The ability to quickly move the arms and legs.
The ability to exert yourself physically over long periods of time without getting winded or out of breath.	Stamina	Stamina	The ability to perform intense physical activities over long periods without becoming winded or out of breath.
The ability to exert maximum muscle force to lift, push, pull, or carry objects.	Static Strength	Static Strength	The ability to exert muscle force to lift, push, pull, carry, or transfer objects.
The ability to use your abdominal and lower back muscles to support part of the body repeatedly or continuously over time without "giving out" or fatiguing.	Trunk Strength	Trunk Strength	The ability to exert your abdominal and lower back muscles to support part of the body repeatedly or continuously over time without "giving out" or fatiguing.
The ability to read and understand information and ideas presented in writing.	Written Comprehension	Written Comprehension	The ability to read and understand information and ideas presented in written form.

The ability to communicate information and ideas in writing so others will understand.	Written Expression	Written Expression	The ability to communicate information and ideas in writing and adapting the writing style to the audience so that they can understand.
The ability to match or detect differences between colors, including shades of color and brightness.	Visual Color Determination	Colour Perception	The ability to match or detect differences or similarities between colours, including shades of colour and brightness.
The ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions.	Control Precision	Control of Settings	The ability to adjust the controls of a machine or a vehicle to exact positions.
The ability to make fast, simple, repeated movements of the fingers, hands, and wrists.	Wrist-Finger Speed	Finger-Hand-Wrist Motion	The ability to make fast, simple, and repeated movements of the fingers, hands, and wrists.
The ability to quickly and repeatedly bend, stretch, twist, or reach out with your body, arms, and/or legs.	Dynamic Flexibility	Body Flexibility	The ability to bend, stretch, twist, or reach with your body, arms, and/or legs.
The ability to bend, stretch, twist, or reach with your body, arms, and/or legs.	Extent Flexibility		
The ability to choose quickly between two or more movements in response to two or more different signals (lights, sounds, pictures). It includes the speed with which the correct response is started with the hand, foot, or other body part.	Response Orientation	Multi-signal response	The ability to choose quickly between one or more movements with the hand, finger, or foot in response to the appearance of two or more different signals such as lights, sounds, or images.
The ability to identify or detect a known pattern (a figure, object, word, or sound) that is hidden in other distracting material.	Flexibility of Closure	Pattern Identification	The ability to identify or detect a known pattern such as a figure, object, word, or sound that is hidden in other information or material.
The ability to quickly make sense of, combine, and organize information into meaningful patterns.	Speed of Closure	Pattern Organization speed	The ability to quickly combine and organize information into meaningful patterns.

The ability to imagine how something will look after it is moved around or when its parts are moved or rearranged.	Visualization	Spatial Visualization	The ability to think visually about geometric forms, comprehend the two-dimensional representation of three-dimensional objects and recognize the relationships resulting from the movement of objects in space.
The ability to shift back and forth between two or more activities or sources of information (such as speech, sounds, touch, or other sources).	Time Sharing	Multitasking	The ability to shift back and forth between two or more activities or sources of information during the same time period (such as speech, sounds, touch, or other sources).

Appendix 2

Occupation Exposure Score for each occupation in Canada.

N°	Code	NOC Occupations Canada	AI exposure of each occupation
1	10010.00	Financial managers	0.882
2	41402.00	Business development officers and market researchers and analysts	0.877
3	10021.01	Banking and other investment managers	0.877
4	10020.04	Securities manager	0.868
5	11109.04	Trust officers	0.867
6	11100.02	Accountants	0.866
7	11101.02	Investment analysts	0.860
8	42200.03	Notaries public	0.858
9	11100.01	Financial auditors	0.857
10	41101.00	Lawyers and Quebec notaries	0.857
11	00012.00	Senior managers - financial, communications and other business services	0.849
12	10011.00	Human resources managers	0.846
13	42200.05	Justice of the peace	0.846

14	00013.00	Senior managers - health, education, social and community services and membership organizations	0.844
15	00014.00	Senior managers - trade, broadcasting and other services	0.842
16	41100.00	Judges	0.840
17	42200.04	Trademark agents	0.832
18	11109.01	Financial examiners and inspectors	0.830
19	10022.04	E-business managers	0.829
20	11101.01	Financial analysts	0.828
21	10020.01	Insurance managers	0.828
22	10021.02	Credit managers	0.827
23	63100.00	Insurance agents and brokers	0.825
24	00011.00	Senior government managers and officials	0.822
25	11103.01	Securities agents and investment dealers	0.819
26	11102.00	Financial advisors	0.818
27	41401.00	Economists and economic policy researchers and analysts	0.817
28	00015.00	Senior managers - construction, transportation, production and utilities	0.813
29	11109.02	Financial investigators	0.812
30	41403.06	Social survey researchers	0.811
31	21210.01	Mathematicians	0.808
32	12104.02	Government benefits services officers	0.807
33	41409.05	Linguists	0.807
34	51114.03	Interpreters	0.807
35	21210.03	Actuaries	0.805
36	51114.01	Translators and translator-revisers	0.805
37	12201.02	Insurance claims examiners	0.803
38	41409.06	Political scientists	0.801
39	11109.03	Financial Underwriters	0.801
40	10020.03	Mortgage broker managers	0.800
41	21210.02	Statisticians	0.800
42	41409.08	Sociologists	0.800
43	51114.02	Terminologists	0.799
44	40010.00	Government managers - health and social policy development and program administration	0.798

45	40012.00	Government managers - education policy development and program administration	0.798
46	10030.00	Telecommunication carriers managers	0.796
47	11200.00	Human resources professionals	0.794
48	31303.03	Genetic counsellors	0.793
49	31200.00	Psychologists	0.792
50	41409.09	Other social science professionals	0.791
51	40011.00	Government managers - economic analysis, policy development and program administration	0.790
52	41405.00	Education policy researchers, consultants and program officers	0.788
53	41406.02	Recreation, sports and fitness policy analysts	0.788
54	41403.01	Social policy researchers	0.788
55	13200.01	Custom brokers	0.787
56	42200.02	Independent paralegals	0.785
57	12113.00	Statistical officers and related research support occupations	0.784
58	40020.02	Registrars	0.784
59	00010.00	Legislators	0.783
60	10012.00	Purchasing managers	0.783
61	41403.07	Social service planners	0.782
62	11202.00	Professional occupations in marketing, advertising and public relations	0.781
63	11201.00	Professional occupations in business management consulting	0.780
64	11103.02	Brokers	0.779
65	40020.01	Faculty administrators	0.778
66	41302.00	Religious leaders	0.776
67	41321.00	Career development practitioners and career counsellors (except education)	0.776
68	10022.02	Marketing managers	0.772
69	10022.03	Public relation managers	0.768
70	10029.00	Other business services managers	0.767
71	41403.03	Housing policy analysts	0.766
72	51111.01	Novelists, playwrights, script writers, poets and other creative writers	0.765
73	12102.00	Procurement and purchasing agents and officers	0.764
74	40019.00	Other managers in public administration	0.763

75	42200.01	Paralegals	0.763
76	12201.01	Insurance adjusters	0.758
77	40030.00	Managers in social, community and correctional services	0.757
78	10019.00	Other administrative services managers	0.757
79	42204.00	Religion workers	0.756
80	41409.07	Psychometricians	0.752
81	41403.04	Immigration and citizenship consultants	0.751
82	41403.05	International aid and development project officers	0.750
83	12200.00	Accounting technicians and bookkeepers	0.748
84	10022.01	Advertising managers	0.747
85	13112.00	Medical administrative assistants	0.747
86	14110.02	Statistical clerks	0.743
87	21103.00	Meteorologists and climatologists	0.742
88	12101.00	Human resources and recruitment officers	0.739
89	10020.02	Real estate service managers	0.736
90	21220.00	Cybersecurity specialists	0.735
91	12104.01	Excise tax revenue officers	0.733
92	13102.00	Payroll administrators	0.733
93	21211.00	Data scientists	0.727
94	12111.00	Health information management occupations	0.727
95	60010.00	Corporate sales managers	0.724
96	41301.00	Therapists in counselling and related specialized therapies	0.724
97	41200.00	University professors and lecturers	0.724
98	41407.00	Program officers unique to government	0.724
99	21230.00	Computer systems developers and programmers	0.722
100	51111.02	Content writers (non-technical)	0.722
101	14101.02	Hospital admitting clerks	0.722
102	40021.02	Administrators of elementary and secondary education	0.721
103	41409.03	Geographers	0.720
104	20012.00	Computer and information systems managers	0.720
105	70020.02	Transportation managers, freight traffic	0.715
106	11109.05	Mortgage brokers	0.715
107	51111.03	Copywriters	0.714
108	41201.02	Post-secondary research assistants	0.713
109	20010.00	Engineering managers	0.710

110	41400.03	Patent agents	0.709
111	14301.04	Readers and press clippers	0.708
112	14200.00	Accounting and related clerks	0.706
113	41201.01	Post-secondary teaching assistants	0.703
114	63102.00	Financial sales representatives	0.703
115	40020.03	Administrator of vocational training schools	0.701
116	51113.00	Journalists	0.699
117	21222.00	Information systems specialists	0.698
118	22303.00	Construction estimators	0.698
119	41404.00	Health policy researchers, consultants and program officers	0.698
120	40021.01	School principals	0.697
121	51110.00	Editors	0.696
122	20011.02	Science Managers	0.694
123	12202.00	Insurance underwriters	0.688
124	65109.03	Telephone solicitors and telemarketers	0.688
125	41320.00	Educational counsellors	0.687
126	30010.00	Managers in health care	0.685
127	51120.05	Film editors	0.684
128	21231.00	Software engineers and designers	0.683
129	64409.00	Other customer and information services representatives	0.681
130	50011.00	Managers - publishing, motion pictures, broadcasting and performing arts	0.679
131	12112.00	Records management technicians	0.677
132	14103.00	Court clerks and related court services occupations	0.676
133	21223.01	Database analysts	0.674
134	20011.01	Architecture and urban planning managers	0.674
135	31100.11	Preventive medicine physicians	0.674
136	14102.00	Personnel clerks	0.673
137	12110.02	Medical transcriptionists	0.670
138	21223.02	Data administrators	0.669
139	51120.04	Art directors	0.668
140	62100.00	Technical sales specialists - wholesale trade	0.668
141	13201.01	Production logistics coordinators	0.666
142	41400.04	Science policy and program officers	0.665
143	14405.00	Transportation route and crew schedulers	0.665

144	14404.00	Dispatchers	0.662
145	21100.01	Physicists	0.662
146	51120.01	Film, radio, television and video game producers	0.661
147	51120.06	Record producers	0.657
148	12011.00	Supervisors, finance and insurance office workers	0.656
149	14202.00	Collection clerks	0.655
150	14110.01	Survey interviewers	0.655
151	72604.02	Marine traffic regulators	0.655
152	51121.03	Arrangers	0.654
153	21311.02	Network system and data communication engineers	0.654
154	14301.05	Regulatory clerks	0.653
155	14101.01	Receptionists	0.652
156	21311.01	Computer and telecommunications hardware engineers	0.651
157	21100.02	Astronomers	0.649
158	14301.03	Proofreaders and editorial assistants	0.648
159	62201.01	Funeral directors	0.648
160	13111.00	Legal administrative assistants	0.645
161	21221.00	Business system specialists	0.640
162	41409.04	Historians	0.636
163	53111.04	Scripts assistants	0.635
164	12100.00	Executive assistants	0.634
165	63101.00	Real estate agents and salespersons	0.633
166	62101.00	Retail and wholesale buyers	0.632
167	21202.00	Urban and land use planners	0.630
168	41400.05	Technology transfer officers	0.630
169	31100.04	Psychiatrists	0.630
170	51112.00	Technical writers	0.630
171	64310.00	Travel counsellors	0.625
172	22222.00	Information systems testing technicians	0.625
173	51120.02	Directors	0.624
174	21301.00	Mechanical engineers	0.621
175	13200.02	Ship brokers	0.621
176	14403.01	Purchasing control workers	0.620
177	21233.00	Web designers	0.618
178	13110.00	Administrative assistants	0.617

179	21331.00	Geological engineers	0.616
180	21390.00	Aerospace engineers	0.614
181	21232.00	Software developers and programmers	0.613
182	31112.02	Speech language pathologists	0.612
183	70020.01	Transportation managers, operations	0.610
184	12012.00	Supervisors, library, correspondence and related information workers	0.608
185	60031.00	Accommodation service managers	0.607
186	14301.02	Correspondence clerks	0.607
187	21109.01	Metallurgists	0.604
188	31100.07	Neurologists	0.601
189	72601.01	Air traffic controllers	0.599
190	14201.02	Insurance clerks	0.598
191	21300.00	Civil engineers	0.595
192	52121.00	Interior designers and interior decorators	0.595
193	62023.01	Customer service representatives supervisors - financial services	0.594
194	21330.00	Mining engineers	0.593
195	62023.02	Customer service representatives supervisors (except financial services)	0.593
196	21109.02	Materials scientists	0.592
197	21332.00	Petroleum engineers	0.592
198	21234.00	Web developers and programmers	0.592
199	72601.02	Flight dispatchers	0.591
200	31121.00	Dietitians and nutritionists	0.589
201	41409.01	Anthropologists	0.589
202	14201.03	Other financial clerks	0.587
203	64201.03	Weight loss consultants	0.585
204	41300.00	Social workers	0.583
205	12203.03	Appraisers	0.578
206	32109.02	Communicative disorders assistants and speech-language pathology assistants	0.576
207	90011.02	Electrical power distribution managers	0.575
208	14201.01	Bank clerks	0.573
209	21200.00	Architects	0.573
210	21399.02	Biomedical engineers	0.571

211	72604.01	Railway traffic controllers	0.570
212	64101.00	Sales and account representatives - wholesale trade (non-technical)	0.568
213	51121.02	Composers	0.566
214	51120.07	Directors of photography	0.562
215	12103.00	Conference and event planners	0.561
216	21310.00	Electrical and electronics engineers	0.559
217	14301.01	Classified advertising clerks	0.556
218	80010.00	Managers in natural resources production and fishing	0.555
219	22220.01	Computer and network operators	0.555
220	31100.02	Internists, general	0.555
221	22211.00	Industrial designers	0.554
222	31301.05	Nursing researchers and consultants	0.553
223	13101.00	Property administrators	0.552
224	22212.01	Drafting technologists	0.549
225	21201.00	Landscape architects	0.548
226	22214.04	Geographic information system (GIS) technologists and technicians	0.546
227	12010.00	Supervisors, general office and administrative support workers	0.541
228	21320.00	Chemical engineers	0.540
229	21322.00	Metallurgical and materials engineers	0.535
230	31100.14	Specialists in laboratory medicine, including pathologists	0.534
231	64201.02	Wedding consultants	0.533
232	21399.03	Engineering physicists and engineering scientists	0.531
233	72601.03	Flight service specialists	0.530
234	22212.02	Drafting technicians	0.530
235	60020.00	Retail and wholesale trade managers	0.522
236	14101.04	Telephone operators	0.515
237	22220.02	Web technicians	0.511
238	22214.05	Meteorological technologists and technicians	0.511
239	31120.02	Industrial pharmacists	0.508
240	22210.00	Architectural technologists and technicians	0.507
241	70010.00	Construction managers	0.505
242	52111.00	Graphic arts technicians	0.503

243	13201.02	Transportation logistics coordinators	0.500
244	14101.03	Switchboard and answering service operators	0.499
245	43203.02	Immigration officers	0.497
246	70012.01	Facility operation managers	0.494
247	65229.00	Other support occupations in personal services	0.494
248	31100.05	Allergists and immunologists	0.492
249	32209.05	Holistic nutritionists	0.491
250	41220.00	Secondary school teachers	0.491
251	50012.00	Recreation, sports and fitness program and service directors	0.490
252	21399.01	Agricultural and bio-resource engineers	0.489
253	21321.00	Industrial and manufacturing engineers	0.486
254	21110.02	Microbiologists and cell and molecular biologists	0.482
255	12110.01	Court reporters	0.481
256	21101.00	Chemists	0.480
257	90010.00	Manufacturing managers	0.480
258	22114.04	Landscape designers and landscape architectural technicians and technologists	0.480
259	14100.01	General office support workers	0.478
260	31112.01	Audiologists	0.477
261	41400.01	Ergonomists	0.475
262	31102.00	General practitioners and family physicians	0.473
263	52120.01	Graphic designers	0.472
264	52114.00	Announcers and other broadcasters	0.469
265	14112.01	Desktop publishing operators	0.464
266	51121.01	Conductors	0.464
267	41400.02	Occupational or industrial hygienists	0.462
268	31100.06	Hospitalists	0.458
269	21399.05	Textile engineers	0.458
270	52119.01	Floor managers	0.456
271	43109.02	Driver's license examiners	0.455
272	31100.09	Dermatologists	0.451
273	31209.03	Doctors of naturopathics medicine	0.449
274	90011.05	Waste systems managers	0.446
275	70011.00	Home building and renovation managers	0.446
276	53123.03	Exhibit designers	0.441

277	21102.01	Geoscientists	0.441
278	21110.01	Biologists	0.440
279	90011.04	Water pollution control managers	0.437
280	31111.00	Optometrists	0.437
281	13100.00	Administrative officers	0.436
282	31303.04	Orthoptists	0.436
283	90011.03	Natural gas and petroleum supply managers	0.432
284	53123.02	Fashion designers	0.430
285	70021.00	Postal and courier services managers	0.428
286	32109.01	Hearing instrument practitioners	0.427
287	52120.02	Illustrators	0.427
288	50010.00	Library, archive, museum and art gallery managers	0.426
289	42201.00	Social and community service workers	0.425
290	51100.00	Librarians	0.425
291	53111.07	Production assistants	0.424
292	72025.00	Supervisors, mail and message distribution occupations	0.419
293	14111.00	Data entry clerks	0.418
294	43202.05	Liquor licence inspectors	0.418
295	90011.01	Water supply managers	0.416
296	41403.02	Home economists	0.414
297	21120.00	Public and environmental health and safety professionals	0.413
298	12013.00	Supervisors, supply chain, tracking and scheduling coordination occupations	0.413
299	12203.01	Assessors	0.412
300	12203.02	Business valuers	0.412
301	22300.02	Civil engineering technicians	0.409
302	60040.00	Managers in customer and personal services	0.408
303	64400.00	Customer services representatives - financial institutions	0.408
304	31120.01	Community pharmacists and hospital pharmacists	0.406
305	31100.03	Pediatricians, general	0.405
306	22214.01	Cartographic technologists and technicians	0.405
307	31100.08	Nuclear medicine physicians	0.400
308	31100.13	Other specialists in clinical medicine	0.400
309	51101.02	Curators	0.396
310	22302.01	Industrial engineering and manufacturing technologists	0.396

311	51102.00	Archivists	0.393
312	70012.02	Maintenance managers	0.391
313	31101.03	Ophthalmologists	0.390
314	22214.02	Photogrammetric technologists and technicians	0.387
315	31300.00	Nursing coordinators and supervisors	0.386
316	64201.01	Image consultants	0.381
317	21399.04	Marine and naval engineers	0.378
318	33109.01	Audiometric technicians	0.374
319	31101.04	Urologists	0.370
320	32209.03	Homeopaths	0.369
321	21109.03	Soil scientists	0.369
322	31301.04	Registered psychiatric nurses	0.368
323	31303.01	Physician Assistants	0.366
324	21102.02	Oceanographers	0.366
325	22300.01	Civil engineering technologists	0.362
326	64410.04	Private investigators	0.355
327	53123.01	Theatre designers	0.355
328	14112.02	Typesetting input and output operators	0.348
329	32209.01	Herbalists	0.345
330	60030.00	Restaurant and food service managers	0.344
331	31100.12	Radiologists	0.344
332	31209.02	Chiropodists and diploma or first-degree trained podiatrists	0.342
333	41221.00	Elementary school and kindergarten teachers	0.342
334	21112.00	Agricultural representatives, consultants and specialists	0.342
335	64312.03	Airline reservation agents	0.340
336	31209.01	Doctors of Podiatric Medicine	0.336
337	62010.00	Retail sales supervisors	0.333
338	72024.00	Supervisors, motor transport and other ground transit operators	0.329
339	22214.03	Aerial survey and remote sensing technologists and technicians	0.321
340	31302.00	Nurse practitioners	0.320
341	80021.00	Managers in horticulture	0.317
342	22310.02	Electrical and electronics engineering technicians	0.316
343	22233.00	Construction inspectors	0.315

344	72205.03	Telecommunications service testers	0.313
345	31101.02	Obstetricians and gynecologists	0.312
346	14100.02	File clerks	0.310
347	92100.02	Power systems operators	0.304
348	22302.02	Industrial engineering and manufacturing technicians	0.303
349	32200.01	Traditional Chinese medicine practitioners	0.298
350	22310.01	Electrical and electronics engineering technologists	0.294
351	41210.00	College and other vocational instructors	0.291
352	80022.00	Managers in aquaculture	0.288
353	42203.00	Instructors of persons with disabilities	0.288
354	52119.02	Key grips	0.287
355	62020.00	Food service supervisors	0.285
356	92020.00	Supervisors, motor vehicle assembling	0.284
357	51114.04	Sign language Interpreters	0.283
358	31100.01	Anesthesiologists	0.282
359	31100.10	Physical medicine and rehabilitation physicians	0.280
360	22313.01	Aircraft instrument mechanics and technicians	0.278
361	53201.02	Sports scouts	0.275
362	31303.05	Pathologist assistants	0.274
363	31101.01	General surgery	0.274
364	22221.00	User support technicians	0.273
365	41311.00	Probation and parole officers	0.272
366	42202.01	Early childhood educators	0.271
367	52112.00	Broadcast technicians	0.269
368	43109.04	Modelling instructors	0.269
369	64314.00	Hotel front desk clerks	0.267
370	51122.03	Teachers of music or voice	0.265
371	31101.05	Other specialists in surgery	0.264
372	31301.02	Occupational health nurses	0.263
373	80020.00	Managers in agriculture	0.261
374	31110.04	Prosthodontists	0.260
375	32123.02	Electrophysiological technologists	0.259
376	22231.05	Oil and gas drilling rig inspectors	0.257
377	43100.00	Elementary and secondary school teacher assistants	0.256
378	64321.00	Casino workers	0.256

379	31301.06	Clinical nurses	0.256
380	32120.00	Medical laboratory technologists	0.256
381	22232.00	Occupational health and safety specialists	0.253
382	41310.02	Coroners and medical examiners	0.253
383	31110.02	Oral and Maxillofacial Surgeons	0.248
384	62022.00	Accommodation, travel, tourism and related services supervisors	0.248
385	32110.00	Denturists	0.246
386	62202.02	Watch repairers	0.245
387	14402.00	Production logistics workers	0.245
388	22110.01	Biological technologists	0.244
389	51122.02	Singers	0.243
390	32100.00	Opticians	0.239
391	53121.02	Acting teachers	0.237
392	53100.04	Curatorial assistants, museum extension officers, museology technicians and museum registrars and cataloguers	0.237
393	31110.03	Orthodontists	0.236
394	41409.02	Archaeologists	0.234
395	92011.00	Supervisors, petroleum, gas and chemical processing and utilities	0.233
396	22100.01	Chemical technologists	0.232
397	92013.00	Supervisors, plastic and rubber products manufacturing	0.230
398	32109.03	Ophthalmic technologists and technicians	0.229
399	32209.06	Naturopaths	0.229
400	52100.02	Public archive technicians	0.228
401	62202.01	Jewellers and related workers	0.227
402	64311.03	Ship pursers	0.226
403	92012.00	Supervisors, food and beverage processing	0.223
404	92014.00	Supervisors, forest products processing	0.223
405	32129.01	Dietary technicians	0.221
406	92015.00	Supervisors, textile, fabric, fur and leather products processing and manufacturing	0.220
407	92022.00	Supervisors, furniture and fixtures manufacturing	0.220
408	64320.02	Travel guides	0.218
409	31303.02	Midwives	0.217

410	92010.00	Supervisors, mineral and metal processing	0.217
411	92021.00	Supervisors, electronics and electrical products manufacturing	0.217
412	43109.01	Driving instructors	0.216
413	92024.00	Supervisors, other products manufacturing and assembly	0.214
414	31110.01	Dentists, General	0.213
415	31209.04	Doctors of osteopathic medicine	0.213
416	64410.03	Corporate security officers	0.212
417	52100.01	Library Technicians	0.212
418	92023.00	Supervisors, other mechanical and metal products manufacturing	0.211
419	64313.02	Cargo service representatives (except airline)	0.208
420	41310.01	Police investigators	0.208
421	32121.02	Nuclear medicine technologists	0.206
422	22100.02	Chemical technicians	0.205
423	53124.08	Craft instructors	0.205
424	32129.02	Ocularists	0.202
425	21109.04	Astronauts	0.201
426	22101.01	Geological and mineral technologists	0.199
427	33100.02	Dental Laboratory Assistants	0.196
428	22110.02	Biological technicians	0.193
429	33109.04	Ophthalmic assistants	0.193
430	31203.00	Occupational therapists	0.190
431	72020.00	Contractors and supervisors, mechanic trades	0.189
432	32112.00	Dental technologists and technicians	0.188
433	22313.04	Avionics inspectors	0.188
434	62029.00	Other services supervisors	0.186
435	53100.01	Conservation and restoration technicians	0.185
436	22301.01	Mechanical engineering technologists	0.185
437	32124.00	Pharmacy technicians	0.185
438	94211.02	Other wood products inspectors	0.183
439	82010.00	Supervisors, logging and forestry	0.183
440	72600.02	Flight engineers	0.182
441	72404.02	Aircraft inspectors	0.182
442	51101.01	Conservators	0.178

443	22230.00	Non-destructive testers and inspectors	0.177
444	22101.02	Geological and mineral technicians	0.172
445	94210.04	Furniture and fixture inspectors	0.172
446	43202.08	Zoning inspectors	0.172
447	22231.02	Railway accident investigation officers	0.172
448	52113.00	Audio and video recording technicians	0.172
449	33101.00	Medical laboratory assistants and related technical occupations	0.171
450	65109.02	Door-to-door salespersons and street vendors	0.171
451	32103.02	Clinical perfusionists	0.169
452	32129.03	Prosthetists and orthotists	0.166
453	72600.03	Flying instructors	0.165
454	72600.01	Air pilots	0.165
455	43202.02	By-law enforcement officers	0.164
456	22313.02	Aircraft electrical mechanics and technicians	0.159
457	62201.02	Embalmers	0.159
458	93102.00	Pulping, papermaking and coating control operators	0.159
459	41406.01	Recreation, sports and fitness consultants	0.158
460	72022.00	Supervisors, printing and related occupations	0.157
461	53100.03	Museum interpreters	0.157
462	31301.03	Community Health Nurses	0.156
463	22231.03	Airworthiness inspectors	0.156
464	64312.02	Airline cargo and freight agents	0.156
465	64100.01	Retail salespersons	0.155
466	32123.01	Cardiology technologists	0.153
467	14300.00	Library assistants and clerks	0.153
468	55109.04	Influencers	0.151
469	64313.01	Ticket agents and related clerks (except airline)	0.151
470	63211.02	Cosmeticians	0.151
471	53100.05	Taxidermists	0.150
472	21111.00	Forestry professionals	0.149
473	63211.03	Electrologists	0.148
474	31301.01	General duty registered nurses	0.148
475	53110.00	Photographers	0.147
476	72023.00	Supervisors, railway transport operations	0.145

477	42202.02	Early childhood educator assistants	0.143
478	43109.03	Sewing instructors	0.142
479	63211.04	Manicurists and pedicurist	0.141
480	64410.05	Retail loss prevention officers	0.140
481	41406.03	Recreation, sports and fitness program supervisors	0.140
482	43202.04	Garbage collection inspectors	0.139
483	22111.05	Plant protection inspectors	0.135
484	32200.02	Acupuncturists	0.134
485	82020.00	Supervisors, mining and quarrying	0.134
486	31103.00	Veterinarians	0.133
487	45100.01	Student monitors	0.133
488	72021.00	Contractors and supervisors, heavy equipment operator crews	0.133
489	92100.01	Power engineers	0.133
490	32121.03	Radiation therapists	0.129
491	64312.01	Airline passenger, baggage and ticket agents	0.129
492	21203.00	Land surveyors	0.128
493	53201.01	Coaches	0.128
494	32103.03	Cardiopulmonary technologists	0.128
495	53100.02	Preparators and picture framers	0.127
496	63202.00	Bakers	0.125
497	32209.04	Reflexologists	0.124
498	72011.00	Contractors and supervisors, electrical trades and telecommunications occupations	0.123
499	22111.02	Fruit and vegetables inspectors	0.123
500	22111.03	Grain inspectors	0.123
501	22111.04	Meat inspectors	0.123
502	64320.01	Tour guides	0.121
503	72010.00	Contractors and supervisors, machining, metal forming, shaping and erecting trades and related occupations	0.121
504	22111.01	Fish and fish products inspectors	0.120
505	32111.02	Dental therapists	0.118
506	52119.07	Settings shop foremen and property masters	0.117
507	32103.01	Respiratory therapists	0.115
508	53111.03	Props persons and set builders	0.114

509	72014.00	Contractors and supervisors, other construction trades, installers, repairers and servicers	0.114
510	22301.02	Mechanical engineering technicians	0.113
511	22213.01	Land survey technologists	0.110
512	33109.02	Orthopedic technologists	0.109
513	53125.00	Patternmakers - textile, leather and fur products	0.108
514	62200.01	Head Chefs	0.108
515	72012.00	Contractors and supervisors, pipefitting trades	0.106
516	22231.01	Motor Vehicle defects investigators	0.104
517	94205.02	Inspectors and testers in electrical apparatus manufacturing	0.104
518	63211.01	Estheticians	0.104
519	62200.03	Specialist chefs	0.102
520	31201.00	Chiropractors	0.102
521	14403.02	Inventory control workers	0.101
522	72013.00	Contractors and supervisors, carpentry trades	0.100
523	73310.01	Railway locomotive engineers	0.099
524	63211.06	Tattoo artists	0.099
525	94203.03	Inspectors, industrial electrical motors and transformers	0.098
526	94212.02	Plastic products inspectors	0.097
527	32122.00	Medical sonographers	0.097
528	53202.00	Sports officials and referees	0.096
529	31202.00	Physiotherapists	0.095
530	22213.02	Land survey technicians	0.094
531	53111.02	Motion picture projectionists	0.094
532	94151.01	Graphic arts camera operators, scanner operators, film strippers and assemblers	0.094
533	94133.00	Inspectors and graders, textile, fabric, fur and leather products manufacturing	0.092
534	94204.02	Mechanical inspectors	0.092
535	53122.03	Art instructors and teachers	0.091
536	94202.02	Inspectors and testers, electrical appliance, apparatus and equipment manufacturing	0.091
537	33109.07	Blood donor clinic assistants	0.088
538	82021.00	Contractors and supervisors, oil and gas drilling and services	0.087
539	82030.02	Farm supervisors	0.087

540	32121.04	Magnetic Resonance Technologist	0.087
541	94112.03	Rubber products inspectors	0.086
542	33103.00	Pharmacy technical assistants and pharmacy assistants	0.084
543	62200.02	Sous-Chefs	0.083
544	40041.00	Fire chiefs and senior firefighting officers	0.081
545	32111.01	Dental hygienists	0.080
546	94219.02	Product inspectors	0.079
547	32101.02	Operating room technicians	0.078
548	94151.03	Prepress technicians, platemakers, proofmakers, and pre-flight/file-preparation operators	0.076
549	32129.04	Prosthetic and orthotic technicians	0.075
550	94104.00	Inspectors and testers, mineral and metal processing	0.075
551	73310.02	Yard locomotive engineers	0.073
552	94201.02	Electronics inspectors and testers	0.073
553	32209.02	Osteopathic manual practitioners	0.072
554	72603.00	Engineer officers, water transport	0.072
555	40042.00	Commissioned officers of the Canadian Armed Forces	0.071
556	94153.00	Photographic and film processors	0.070
557	94143.00	Testers and graders, food and beverage processing	0.069
558	43202.07	Taxi inspectors	0.067
559	64300.00	Maîtres d'hôtel and hosts/hostesses	0.066
560	33109.05	Optical/ophthalmic laboratory technicians and assistants	0.065
561	73311.01	Railway conductors	0.065
562	32121.01	Radiological technologists	0.064
563	33109.08	Morgue attendants	0.063
564	53124.09	Artistic floral arrangers	0.061
565	64311.02	Flight pursers, customer service directors and passenger service directors	0.061
566	72602.00	Deck officers, water transport	0.059
567	63211.05	Scalp treatment specialists	0.059
568	93101.00	Central control and process operators, petroleum, gas and chemical processing	0.057
569	94110.00	Chemical plant machine operators	0.055
570	75210.03	Ferry terminal workers	0.055
571	53122.01	Painters	0.054

572	22231.04	Inspectors, weights and measures	0.054
573	64301.00	Bartenders	0.052
574	51122.01	Musicians	0.049
575	65109.01	Demonstrators and direct distributors	0.048
576	40040.00	Commissioned police officers and related occupations in public protection services	0.047
577	82030.01	Agricultural service contractors	0.046
578	22313.03	Avionics mechanics and technicians	0.043
579	32104.00	Animal health technologists and veterinary technicians	0.043
580	64200.03	Milliners	0.033
581	52119.04	Stunt co-ordinators and special effects technicians	0.031
582	32109.04	Physical Rehabilitation therapists	0.030
583	52110.00	Film and video camera operators	0.030
584	94150.00	Plateless printing equipment operators	0.029
585	43202.03	Commercial transport inspectors	0.028
586	92101.01	Water treatment plant operators	0.027
587	94200.02	Motor vehicle inspectors and testers	0.026
588	72102.00	Sheet metal workers	0.026
589	22312.00	Industrial instrument technicians and mechanics	0.026
590	92101.02	Liquid waste plant operators	0.026
591	72101.01	Tool and die makers	0.026
592	54100.02	Fitness appraisers	0.024
593	52119.06	Costumiers	0.024
594	93200.02	Aircraft assembly inspectors	0.023
595	53121.01	Actors and comedians	0.023
596	64100.02	Visual merchandisers	0.022
597	64200.01	Tailors, Dressmakers and Alterationists	0.020
598	64200.02	Furriers	0.019
599	72999.01	Gunsmiths	0.016
600	22112.00	Forestry technologists and technicians	0.016
601	94123.02	Other wood processing inspectors and graders	0.015
602	53111.01	Camera crane operators	0.014
603	32101.01	Licensed practical nurses	0.014
604	94123.01	Lumber graders	0.013
605	72422.00	Electrical mechanics	0.012

606	72100.02	Machining and tooling inspectors	0.011
607	52119.05	Make-up artists	0.011
608	72429.00	Other small engine and small equipment repairers	0.010
609	32102.00	Paramedical occupations	0.009
610	53124.03	Metal art workers	0.003
611	94111.01	Mixing machine operators - plastic processing	0.002
612	43203.01	Border services and customs officers	0.001
613	72501.00	Water well drillers	0.000
614	75210.04	Boat operators	-0.001
615	94111.03	Extruding process operators - plastic processing	-0.003
616	72404.01	Aircraft mechanics	-0.004
617	42100.00	Police officers (except commissioned)	-0.005
618	53122.02	Sculptors	-0.006
619	22311.00	Electronic service technicians (household and business equipment)	-0.006
620	93100.00	Central control and process operators, mineral and metal processing	-0.008
621	82031.00	Contractors and supervisors, landscaping, grounds maintenance and horticulture services	-0.008
622	44100.02	Foster parents	-0.010
623	63211.07	Hair replacement technicians (non-medical)	-0.010
624	72202.00	Power system electricians	-0.011
625	33100.01	Dental assistants	-0.011
626	72201.00	Industrial electricians	-0.011
627	31204.02	Kinesiologists and exercise therapists	-0.012
628	94111.02	Calendering process operators - plastic processing	-0.013
629	72423.02	Recreation vehicle technicians	-0.014
630	42101.00	Firefighters	-0.015
631	73401.00	Printing press operators	-0.017
632	31204.01	Recreational therapists	-0.017
633	45100.02	Crossing guards	-0.019
634	75200.01	Taxi and limousine drivers	-0.023
635	73301.02	School bus drivers	-0.025
636	72410.01	Automotive service technicians	-0.026
637	72405.00	Machine fitters	-0.027

638	73402.02	Blasters - surface mining, quarrying and construction	-0.027
639	65329.06	Ticket takers and ushers	-0.028
640	72205.01	Telephone installers and repairers	-0.028
641	72200.00	Electricians (except industrial and power system)	-0.028
642	32109.05	Physiotherapy assistants and occupational therapy assistants	-0.029
643	33109.06	Sterile processing technicians	-0.032
644	72100.01	Machinists	-0.033
645	75200.02	Chauffeurs	-0.034
646	73209.00	Other repairers and servicers	-0.036
647	72410.03	Transport truck and trailer mechanics	-0.036
648	72205.04	Telecommunications equipment technicians	-0.036
649	44100.01	Home child care providers	-0.037
650	64311.01	Flight attendants	-0.037
651	63200.00	Cooks	-0.038
652	52119.03	Gaffers and lighting technicians	-0.039
653	72423.01	Motorcycle, all-terrain vehicle and other related mechanics	-0.039
654	53111.06	Dressers	-0.039
655	72420.00	Oil and solid fuel heating mechanics	-0.039
656	94106.00	Machining tool operators	-0.040
657	22114.02	Golf course superintendents	-0.040
658	72101.02	Metal mould makers and patternmakers	-0.040
659	94130.01	Textile fibre, yarn, hide and pelt processing machine operators	-0.040
660	72999.03	Safe and vault servicers	-0.041
661	74100.02	Mailroom clerks	-0.042
662	94140.01	Process control operators, food and beverage processing	-0.042
663	72500.00	Crane operators	-0.042
664	72999.05	Die setters	-0.043
665	73301.01	Bus and streetcar drivers	-0.043
666	94203.01	Assemblers, industrial electrical motors and transformers	-0.045
667	72999.02	Locksmiths	-0.045
668	73301.03	Subway train and light rail transit operators	-0.046
669	72103.00	Boilermakers	-0.048
670	94201.01	Electronics assemblers and fabricators	-0.049
671	72410.02	Mechanical repairers, motor vehicle manufacturing	-0.049

672	94204.01	Mechanical assemblers	-0.050
673	74204.01	Waterworks maintenance workers	-0.050
674	72402.00	Heating, refrigeration and air conditioning mechanics	-0.053
675	72421.02	Major appliance repairers/technicians	-0.054
676	94107.00	Machine operators of other metal products	-0.054
677	53124.07	Weavers	-0.054
678	94111.04	Moulding process operators - plastic processing	-0.057
679	94202.01	Assemblers, electrical appliance, apparatus and equipment manufacturing	-0.057
680	14401.00	Storekeepers and partspersons	-0.058
681	64401.00	Postal services representatives	-0.058
682	63210.02	Barbers	-0.058
683	72205.05	Television cable service technicians	-0.059
684	94200.01	Motor vehicle assemblers	-0.059
685	94105.01	Metalworking machine operators	-0.059
686	74204.02	Gas maintenance workers	-0.061
687	72999.04	Saw fitters	-0.063
688	72400.01	Construction millwrights and industrial mechanics	-0.064
689	65329.07	Other elemental service workers	-0.064
690	63210.01	Hairstylists	-0.065
691	22113.00	Conservation and fishery officers	-0.066
692	42102.00	Specialized members of the Canadian Armed Forces	-0.066
693	65100.00	Cashiers	-0.067
694	75210.02	Cable ferry operators	-0.067
695	73402.01	Drillers - surface mining, quarrying and construction	-0.067
696	94112.01	Rubber processing machine operators	-0.068
697	94122.00	Paper converting machine operators	-0.068
698	94219.01	Product assemblers and finishers	-0.068
699	94105.02	Forging machine operators	-0.069
700	72421.01	Small electrical appliance servicers and repairers	-0.069
701	72205.02	Switch network installers and repairers	-0.069
702	94100.00	Machine operators, mineral and metal processing	-0.070
703	94140.02	Machine operators, food and beverage processing	-0.071
704	63221.00	Upholsterers	-0.072
705	94102.01	Glass process control operators	-0.072

706	94205.01	Machine operators in electrical apparatus manufacturing	-0.072
707	75210.01	Lock equipment operators	-0.073
708	72300.00	Plumbers	-0.074
709	72400.02	Textile machinery mechanics and repairers	-0.074
710	94152.00	Binding and finishing machine operators	-0.074
711	22114.03	Horticulturists	-0.076
712	65211.02	Attendants in amusement, recreation and sport	-0.078
713	72406.00	Elevator constructors and mechanics	-0.078
714	43200.00	Sheriffs and bailiffs	-0.079
715	73201.00	General building maintenance workers and building superintendents	-0.082
716	94130.02	Textile, hide and pelt dyeing and finishing machine operators	-0.082
717	62024.00	Cleaning supervisors	-0.085
718	63201.00	Butchers - retail and wholesale	-0.085
719	72203.00	Electrical power line and cable workers	-0.086
720	43204.00	Operations Members of the Canadian Armed Forces	-0.086
721	72204.00	Telecommunications line and cable installers and repairers	-0.086
722	74202.00	Air transport ramp attendants	-0.087
723	73300.01	Long-haul transport truck drivers	-0.089
724	95105.03	Fur cutters	-0.090
725	64322.00	Outdoor sport and recreational guides	-0.093
726	64410.01	Security guards	-0.095
727	43202.01	Animal control officer	-0.095
728	63220.02	Shoe repairers	-0.096
729	53124.06	Instrument makers	-0.097
730	65211.01	Amusement attraction operators	-0.098
731	44101.00	Home support workers, caregivers and related occupations	-0.098
732	64410.02	Armoured car guards	-0.099
733	72104.00	Structural metal and platework fabricators and fitters	-0.101
734	94102.03	Glass finishing machine operators	-0.102
735	94103.02	Clay products forming and finishing machine operators	-0.104
736	43202.06	Parking control officers	-0.104
737	94101.03	Foundry furnace operators	-0.105
738	94210.02	Furniture finishers	-0.106
739	53124.02	Glass blowers	-0.106

740	94151.02	Etchers and engravers	-0.106
741	84101.02	Oil and gas well service operators	-0.106
742	73202.00	Pest controllers and fumigators	-0.106
743	72403.00	Railway carmen/women	-0.107
744	95105.02	Fabric cutters	-0.107
745	72411.00	Auto body collision, refinishing and glass technicians and damage repair estimators	-0.108
746	94102.02	Glass forming machine operators	-0.108
747	94212.01	Plastic products assemblers and finishers	-0.108
748	43201.00	Correctional service officers	-0.109
749	53124.05	Stained glass artists	-0.110
750	83101.02	Oil and gas well loggers, testers and related workers	-0.111
751	65329.05	Parking lot attendants and car jockeys	-0.111
752	14400.00	Shippers and receivers	-0.111
753	73400.00	Heavy equipment operators	-0.113
754	72302.00	Gas fitters	-0.114
755	62021.00	Executive housekeepers	-0.115
756	94121.00	Pulp mill, papermaking and finishing machine operators	-0.115
757	53124.01	Carvers	-0.118
758	63220.01	Shoemakers	-0.118
759	95105.04	Leather cutters	-0.120
760	72106.01	Welders	-0.120
761	65329.03	Funeral home attendants	-0.121
762	65329.01	Beauty salon attendants	-0.121
763	93200.01	Aircraft assemblers	-0.123
764	73311.02	Brakemen	-0.124
765	55109.02	Magicians and illusionists	-0.126
766	65210.02	Ship and train service attendants	-0.127
767	75201.00	Delivery service drivers and door-to-door distributors	-0.128
768	74102.00	Couriers and messengers	-0.133
769	94124.00	Woodworking machine operators	-0.134
770	72301.01	Steamfitters and pipefitters	-0.135
771	72401.00	Heavy-duty equipment mechanics	-0.135
772	54100.01	Program leaders and instructors in recreation and sport	-0.137
773	94129.00	Other wood processing machine operators	-0.137

774	94210.03	Furniture refinishers	-0.137
775	94120.00	Sawmill machine operators	-0.139
776	33109.03	Rehabilitation aides	-0.139
777	83110.00	Logging machinery operators	-0.142
778	72301.02	Sprinkler system installers	-0.143
779	94132.00	Industrial sewing machine operators	-0.144
780	73111.00	Glaziers	-0.145
781	84101.01	Oil and gas well drilling workers	-0.145
782	83101.01	Oil and gas well drillers and well servicers	-0.148
783	94101.02	Metal casters	-0.148
784	94131.00	Weavers, knitters and other fabric making occupations	-0.148
785	74201.01	Engine room crew - water transport	-0.149
786	74101.00	Letter carriers	-0.152
787	74200.01	Railway yard workers	-0.153
788	73300.02	Short-haul and local transport truck drivers	-0.154
789	83120.00	Fishing masters and officers	-0.154
790	72311.00	Cabinetmakers	-0.155
791	44200.00	Primary combat members of the Canadian Armed Forces	-0.155
792	75101.02	Material handlers (equipment operators)	-0.156
793	72999.06	Commercial divers	-0.156
794	53111.05	Grips and riggers	-0.157
795	65220.00	Pet groomers and animal care workers	-0.157
796	22114.07	Lawn care specialists	-0.159
797	94210.01	Furniture and fixture assemblers	-0.162
798	94103.01	Concrete products forming and finishing machine operators and workers	-0.163
799	72106.02	Welding, brazing and soldering machine operators	-0.164
800	94211.01	Other wood products assemblers	-0.167
801	94213.02	Industrial metal finishing process operators	-0.168
802	65202.00	Meat cutters and fishmongers - retail and wholesale	-0.169
803	74203.00	Automotive and heavy truck and equipment parts installers and servicers	-0.169
804	32201.00	Massage therapists	-0.172
805	72310.00	Carpenters	-0.173
806	75100.00	Longshore workers	-0.174

807	65200.00	Food and beverage servers	-0.176
808	74205.00	Public works maintenance equipment operators and related workers	-0.178
809	94102.04	Glass cutters	-0.179
810	73200.00	Residential and commercial installers and servicers	-0.180
811	53124.04	Potters	-0.181
812	94203.02	Electrical fitters and wirers, industrial electrical motors and transformers	-0.184
813	74201.02	Deck crew, water transport	-0.185
814	94112.02	Assemblers, rubber products	-0.187
815	65329.02	Door attendants	-0.187
816	65101.00	Automotive and watercraft service station attendants	-0.192
817	33102.00	Nurse aides, orderlies and patient service associates	-0.194
818	51120.03	Choreographers	-0.203
819	73101.00	Tilesetters	-0.206
820	73102.03	Lathers	-0.210
821	84111.00	Silviculture and forestry workers	-0.211
822	72321.00	Insulators	-0.218
823	94213.01	Industrial painters and coaters	-0.220
824	84121.00	Fishing vessel deckhands	-0.220
825	84100.00	Underground mine service and support workers	-0.222
826	74200.02	Railway track maintenance workers	-0.223
827	83100.00	Underground production and development miners	-0.223
828	84120.02	Farm machinery operators	-0.228
829	83121.00	Fishermen/women	-0.232
830	55109.01	Buskers	-0.237
831	94101.01	Mouldmakers and coremakers	-0.237
832	73110.01	Roofers	-0.239
833	22114.01	Arborists and tree service technicians	-0.240
834	84120.01	Specialized livestock workers	-0.240
835	53121.03	Circus and other performers	-0.241
836	65210.03	Facilities workers	-0.245
837	95101.00	Labourers in metal fabrication	-0.245
838	85104.00	Trappers and hunters	-0.246
839	73110.02	Shinglers	-0.247

840	55109.03	Fashion Models	-0.248
841	53120.02	Dance teachers	-0.250
842	72105.00	Ironworkers	-0.253
843	73102.01	Plasterers	-0.256
844	94142.01	Fish and seafood plant machine operators	-0.256
845	74100.01	Mail sorters	-0.258
846	85110.00	Mine labourers	-0.258
847	65320.03	Ironing, pressing and finishing workers	-0.260
848	75212.00	Public works and maintenance labourers	-0.260
849	94103.03	Stone forming and finishing workers	-0.262
850	65329.04	Laundromat attendants	-0.265
851	65201.01	Food counter attendants and food preparers	-0.269
852	53200.00	Athletes	-0.269
853	85102.00	Aquaculture and marine harvest labourers	-0.275
854	75211.01	Railway labourers	-0.275
855	65320.01	Dry cleaning and laundry machine operators	-0.275
856	95107.00	Labourers in fish and seafood processing	-0.275
857	95100.00	Labourers in mineral and metal processing	-0.275
858	65201.04	Dishwashers	-0.276
859	75119.00	Other trades helpers and labourers	-0.276
860	85120.00	Logging and forestry labourers	-0.282
861	75211.02	Motor transport labourers	-0.284
862	72320.00	Bricklayers	-0.285
863	73102.02	Drywall installers and finishers	-0.285
864	95106.00	Labourers in food and beverage processing	-0.287
865	73112.00	Painters and decorators (except interior decorators)	-0.291
866	73113.00	Floor covering installers	-0.291
867	65201.03	Food service helpers	-0.293
868	95103.00	Labourers in wood, pulp and paper processing	-0.294
869	95104.00	Labourers in rubber and plastic products manufacturing	-0.295
870	65320.02	Dry cleaning and laundry inspectors and assemblers	-0.298
871	85111.00	Oil and gas drilling, servicing and related labourers	-0.300
872	95102.00	Labourers in chemical products processing and utilities	-0.303
873	95105.01	Labourers in textile processing	-0.303
874	85101.00	Harvesting labourers	-0.305

875	73100.00	Concrete finishers	-0.307
876	65201.02	Kitchen helpers	-0.310
877	65210.01	Guest service attendants and baggage porters	-0.311
878	95109.00	Other labourers in processing, manufacturing and utilities	-0.312
879	65102.00	Store shelf stockers, clerks and order fillers	-0.315
880	84110.00	Chain saw and skidder operators	-0.317
881	85100.00	Livestock labourers\	-0.321
882	65311.04	Vehicle cleaners	-0.323
883	85121.00	Landscaping and grounds maintenance labourers	-0.324
884	65310.02	Housekeepers	-0.326
885	65312.00	Janitors, caretakers and heavy-duty cleaners	-0.340
886	85103.00	Nursery and greenhouse labourers	-0.342
887	75110.00	Construction trades helpers and labourers	-0.343
888	53120.01	Dancers	-0.355
889	22114.06	Landscapers	-0.360
890	22114.05	Landscape gardeners	-0.364
891	94142.02	Fish and seafood plant cutters and cleaners	-0.369
892	65311.02	Chimney cleaners and sandblasters	-0.377
893	94141.03	Poultry preparers	-0.378
894	94141.02	Industrial meat cutters	-0.383
895	65310.01	Light duty cleaners	-0.384
896	75101.01	Material handlers (manual)	-0.384
897	65311.01	Carpet and upholstery cleaners	-0.384
898	65311.03	Furnace and ventilation system cleaners	-0.384
899	65311.05	Window cleaners	-0.392
900	94141.01	Industrial butchers	-0.401