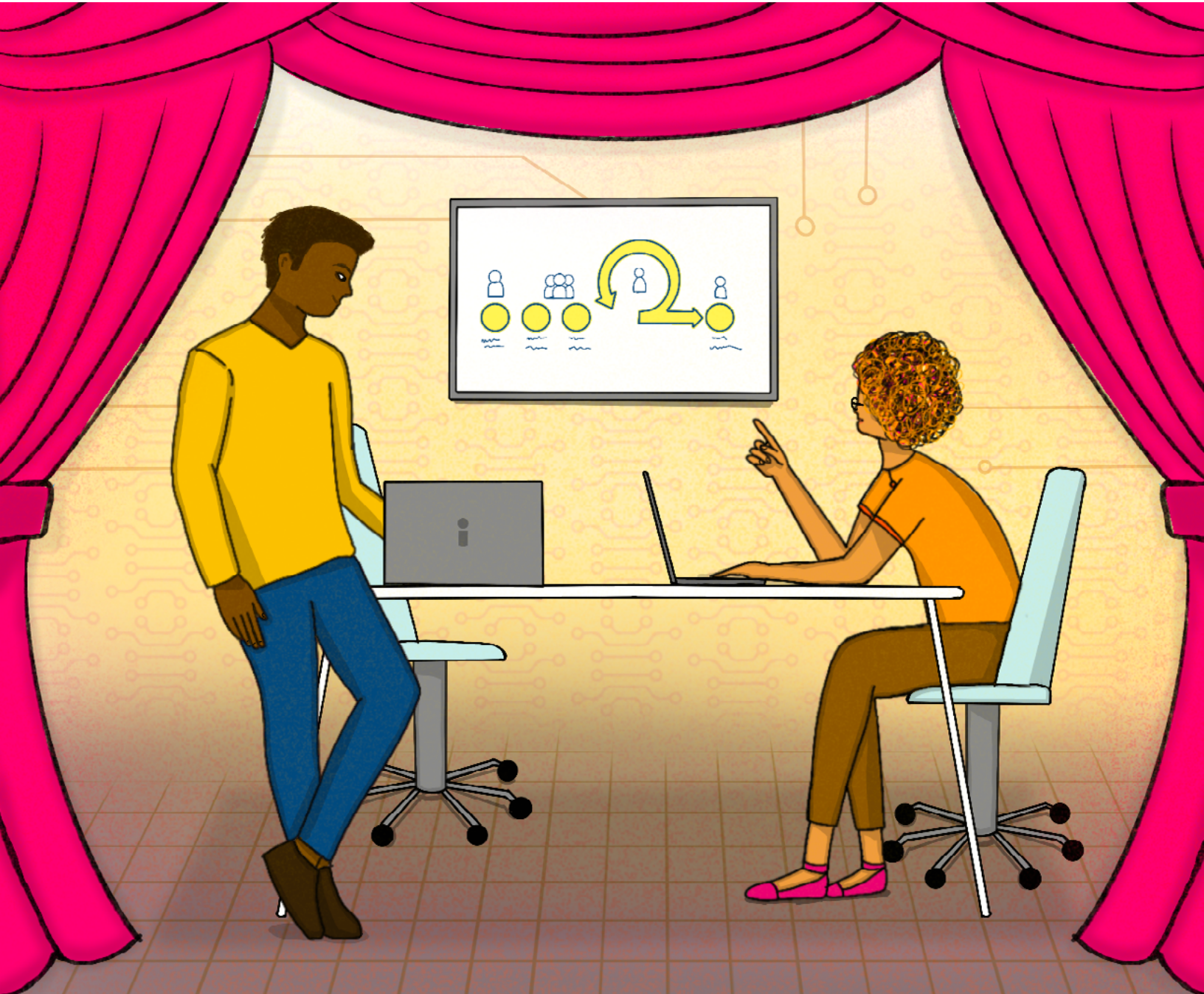


Canada's Got Tech Talent

Examining tech jobs in Canada's federal government

Angus Lockhart and André Côté | January 2025



Acknowledgements

The Dais is a public policy and leadership think tank at Toronto Metropolitan University, working at the intersection of technology, education and democracy to build shared prosperity and citizenship for Canada.

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How to Cite this Report

Lockhart, Angus and André Côté. *Canada's Got Tech Talent: Examining tech jobs in Canada's federal government*. The Dais, 2025. <https://dais.ca>

Graph data in this report can be found at <https://github.com/thedaisTMU/tech-workers-2024>.

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Table of Contents

5 EXECUTIVE SUMMARY

7 INTRODUCTION

8 METHOD OF ANALYSIS

10 FINDINGS

10 Size and share of technology workforce

12 Demographic analysis of tech workers

16 Occupational breakdown of the technology workforce

17 Pay analysis

21 Location of federal tech workers

22 IMPLICATIONS

1

Executive Summary

Most would agree that technology has made our lives easier. From wayfinding and purchasing, to banking and communicating, there's a one-touch app on our phones for virtually every common task.

However, when it comes to accessing federal government services like passport renewal, income tax filing, or employment support, for example, Canadians still don't have these same digital-first conveniences that they enjoy in their everyday lives. As a result, many still experience long lineups for in-person services, page through hard-to-navigate websites, and deal with frustrating paper-based applications.

In fact, according to the United Nations' E-Government Development Index, Canada has fallen from sixth in 2003 to 47th in 2024, with declines in the human capital sub-index.¹ Why is this and how can we address this problem? One way to start is by understanding the demographic and pay of the federal tech workforce to ensure we're attracting the best talent to modernize the public sector.

As the fourth report in the Dais' *Canada's Got Tech Talent* series, this study zooms in on technology workers in Canada's federal public administration to investigate how we can reverse Canada's slide in global digital rankings. Drawing on data from the 2021 Canadian Census, this report explores the federal public administration's tech workforce, offering a comprehensive analysis of its size, demographics, pay structures, occupational mix, and geographic dispersion.

The findings can also serve as a benchmark for future analysis of the health and demographic makeup of the federal tech sector.

By understanding the unique challenges and opportunities within the federal tech workforce, policymakers and federal government leaders can create targeted strategies to build a more modernized, inclusive, skilled, and resilient public sector capable of meeting Canada's evolving digital needs.



This study zooms in on technology workers in Canada's federal public administration to investigate how we can reverse Canada's slide in global digital rankings.

Key findings on Canada's federal tech workforce

Size and composition

1. Of the total federal public administration workforce of 530,000, over 40,000 are tech workers. This represents a higher concentration of tech talent (7.8 percent) than the rest of the workforce (4.7 percent).
2. The federal government employs more tech workers than provincial and municipal governments combined, and tech roles constitute a larger share of its workforce than at other levels of government.

Demographics

3. Federal tech workers are more gender-balanced than the broader Canadian tech workforce but the workforce still remains male-dominated, with women representing less than 30 percent.
4. The workforce is older, with a higher proportion of workers aged 45 to 64 compared to the rest of Canada's tech workforce.
5. Visible minorities account for 32 percent of federal tech workers, lower than their 44 percent representation in Canada's broader tech workforce. Indigenous Peoples are significantly underrepresented, comprising only 2.7 percent of federal tech workers despite comprising over five percent of the federal public administration workforce.

Pay disparities

6. Federal tech workers earn an average salary of \$83,800, which is \$7,500 less than the national average for tech workers.
7. Salaries for federal tech workers in key roles, such as software engineers and financial analysts, lag significantly behind those in the private sector.

Occupational analysis

8. Federal tech roles are concentrated in IT-focused occupations (e.g., information systems specialists, computer and network technicians), emphasizing system maintenance and management.
9. There are disproportionately fewer software engineers, web developers, and programmers in the federal government compared to the broader tech workforce.

Geographic concentration

10. Federal tech workers are highly concentrated in Ottawa, where two-thirds of these workers are located. Ottawa's federal workforce has a 16 percent share of tech workers, compared to just four percent outside the capital.

2

Introduction

Canada has a large tech workforce. The Dais' *Canada's Got Tech Talent* research found that there are now a million workers in Canada engaged in digitally-intensive occupations, accounting for just under five percent of the total workforce.² These tech workers are both important to increasing productivity and earn nearly twice as much as non-tech workers in Canada.

However, one sector that is widely viewed as struggling with digital technology adoption and developing its tech workforce is the federal government. In the United Nations' E-Government Development Index, Canada has fallen from sixth in 2003 to 47th in 2024, with declines in the human capital sub-index.³ This reflects findings from the Dais' *Byte-Sized Progress* study about government

digital modernization, which found significant digital skills deficits within the federal government due to a difficulty attracting talent, a culture that is at odds with digitalization, and a tendency to outsource more digitally-intensive occupations, among other factors.⁴

This report, the fourth in the *Canada's Got Tech Talent* series, assesses the tech workforce in the federal public administration. Using data drawn from the 2021 Canadian Census, the study analyzes the size of the federal tech workforce, their demographics, pay, and occupational mix. The study also looks at how federal tech workers compare with other segments of the public sector and with the rest of Canada's tech workforce.

3

Method of Analysis

This report applies the research methods originally developed for *Who Are Canada's Tech Workers?* (2019) and continued in the *Canada's Got Tech Talent* series of reports. We identify “tech workers” as those in the most digitally-intensive jobs based on their occupational characteristics, and then isolate tech workers within the federal public administration. A brief summary of this methodology is provided below, with the detailed methodology available in the [online appendix](#).

Occupational characteristics are drawn from the United States Department of Labor's Occupational Information Network (O*NET) database, which maintains updated characteristics across a wide range of dimensions for over 1,000 occupations. We combined six specific occupational **skills, knowledge, and work activities (SKWs)** using both their importance and intensity scores. Those SKWs are:

- **Interacting with computers:** Using computers and computer systems (including hardware and software) to program, write software, set up functions, enter data, or process information.

- **Knowledge of computers and electronics:** Including circuit boards, processors, chips, electronic equipment, and computer hardware and software, including applications and programming.
- **Programming:** Writing computer programs for various purposes.
- **Technology design:** Generating or adapting equipment and technology to serve user needs.
- **Knowledge of engineering and technology:** Combined with practical application, which includes applying principles, techniques, procedures, and equipment to the design and production of various goods and services.
- **Telecommunications knowledge:** Includes transmission, broadcasting, switching, control, and operation of telecommunications systems.

To combine these SKWs, we add together their importance and intensity scores and take the harmonic mean of the six SKWs. Those occupations that fall above the 95th percentile in this combined digital intensity score are defined as tech occupations.

To identify workers in federal public administration, we then use Canada’s version of the North American Industry Classification System (NAICS). Specifically, this captures all workers within the 911 NAICS code (federal government public administration). This category includes:

NAICS	Description
9111	Defence services
9112	Federal protective services
9113	Federal labour, employment and immigration services
9114	Foreign affairs and international assistance
9115	Other federal government public administration

For comparison purposes, we use the other NAICS industries within the public administration category: 912 (provincial and territorial public administration), 913 (local, municipal and regional public administration), 914 (Aboriginal public administration), and 919 (international and other extra-territorial public administration). Due to the small sample size, NAICS 914 and 919 are combined in most cases.

We then rely on data from the 2021 Canadian Census for information on the characteristics of tech workers in Canada. Data is accessed through the Canadian Research Data Centre Network for analysis at the most granular level available - in this case, individual census records.



4

Findings

Size and share of technology workforce

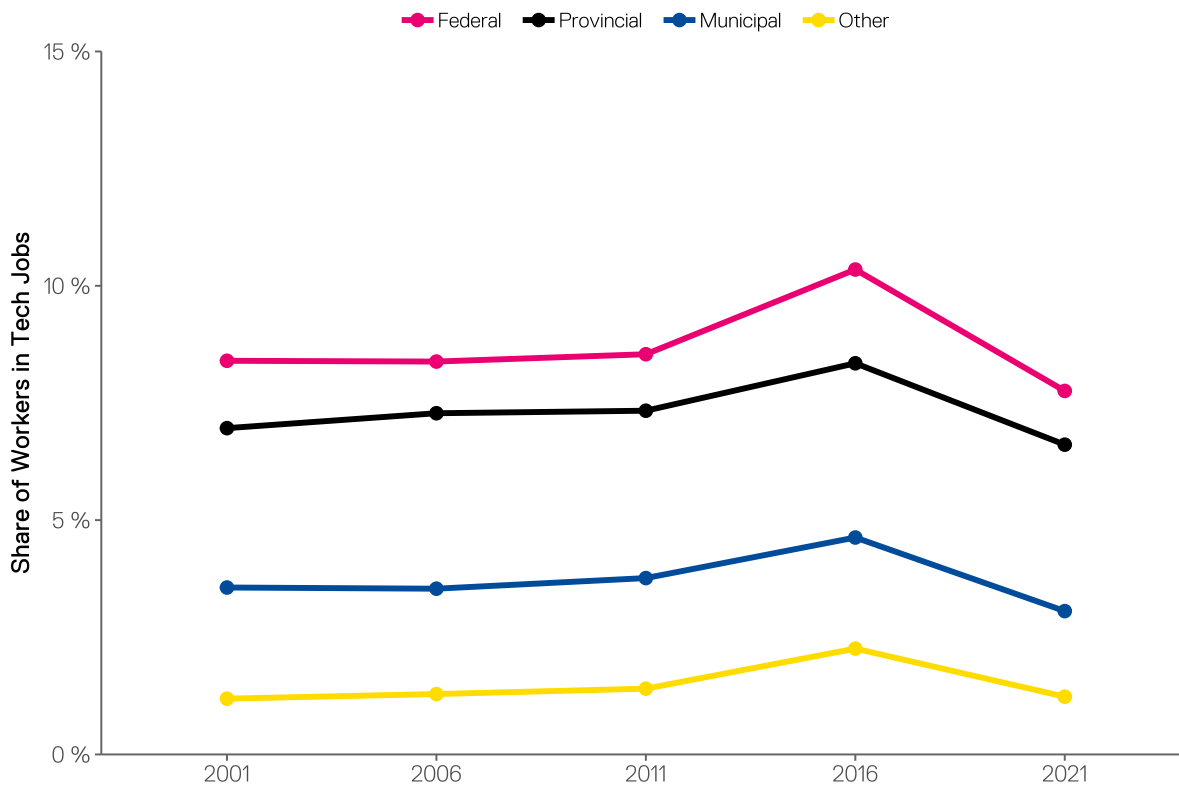
As of the 2021 Census, there are over 41,000 tech workers in federal public administration, which makes up about four percent of Canada's total tech workforce of just over one million. There are a further 33,000 tech workers at other levels of government, for a total of nearly 75,000 tech workers in public administration in Canada.

Table 1: Distribution of tech workers in Canada across sectors

Sector	Number of Tech Workers
Total Tech Workers (Canada)	1,051,875
Federal public administration	41,115
Provincial public administration	21,940
Municipal public administration	11,165
Other public administration	500
Tech workers in the rest of the workforce	977,155

As of the 2021 Census, there are over 41,000 tech workers in federal public administration, which makes up about four percent of Canada's total tech workforce of just over one million.

Figure 1: Tech participation rate



Source: Long Form Census

The share of the federal government public administration working in tech roles has been largely consistent since 2001. Across every Canadian Census back to the turn of the century, the federal government has employed the highest share of tech workers among levels of government—typically hovering around eight percent of their workforce, with an upward variance in 2016. Provincial governments have been close behind in terms of the share of their workforce tech workers represent, with municipal, Indigenous, and international governments lagging behind more significantly.

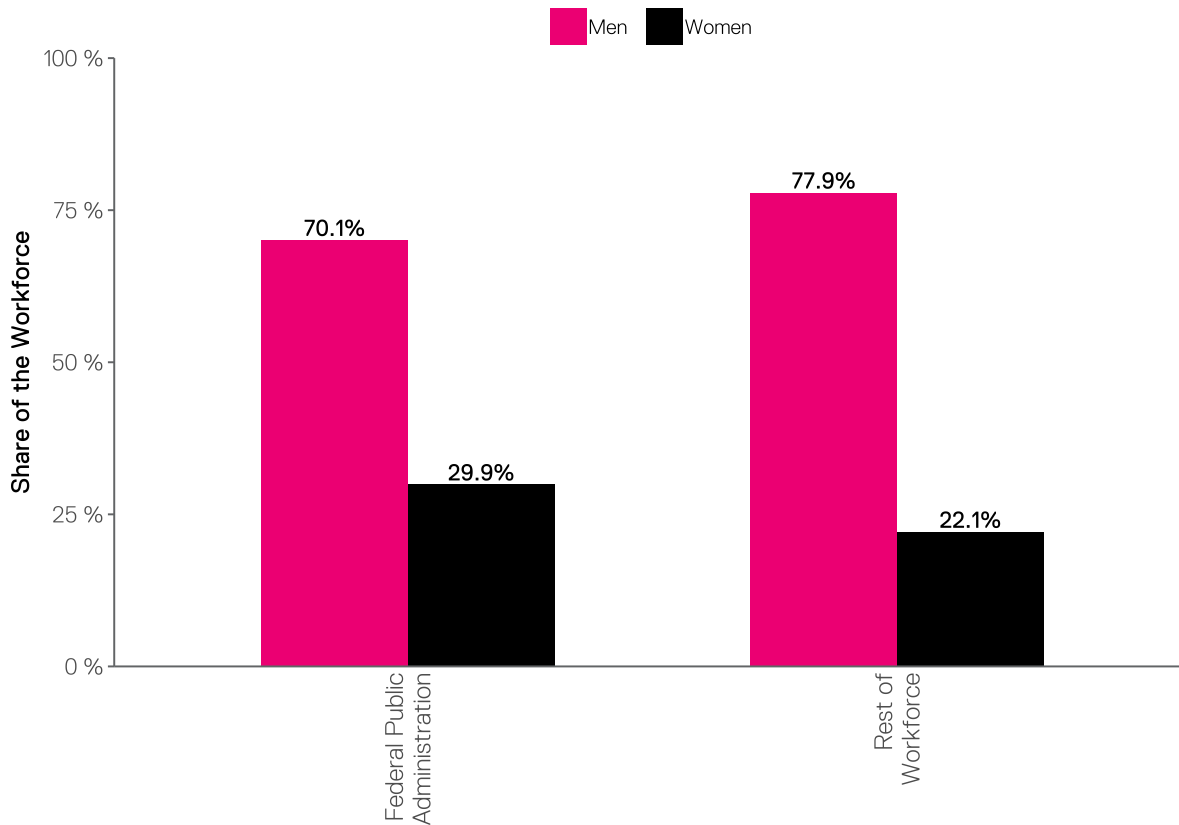
Across every Canadian Census back to the turn of the century, the federal government has employed the highest share of tech workers among levels of government.



Demographic analysis of tech workers

Federal government tech workers are more likely to be male, older, and not to identify as a visible minority or Indigenous.

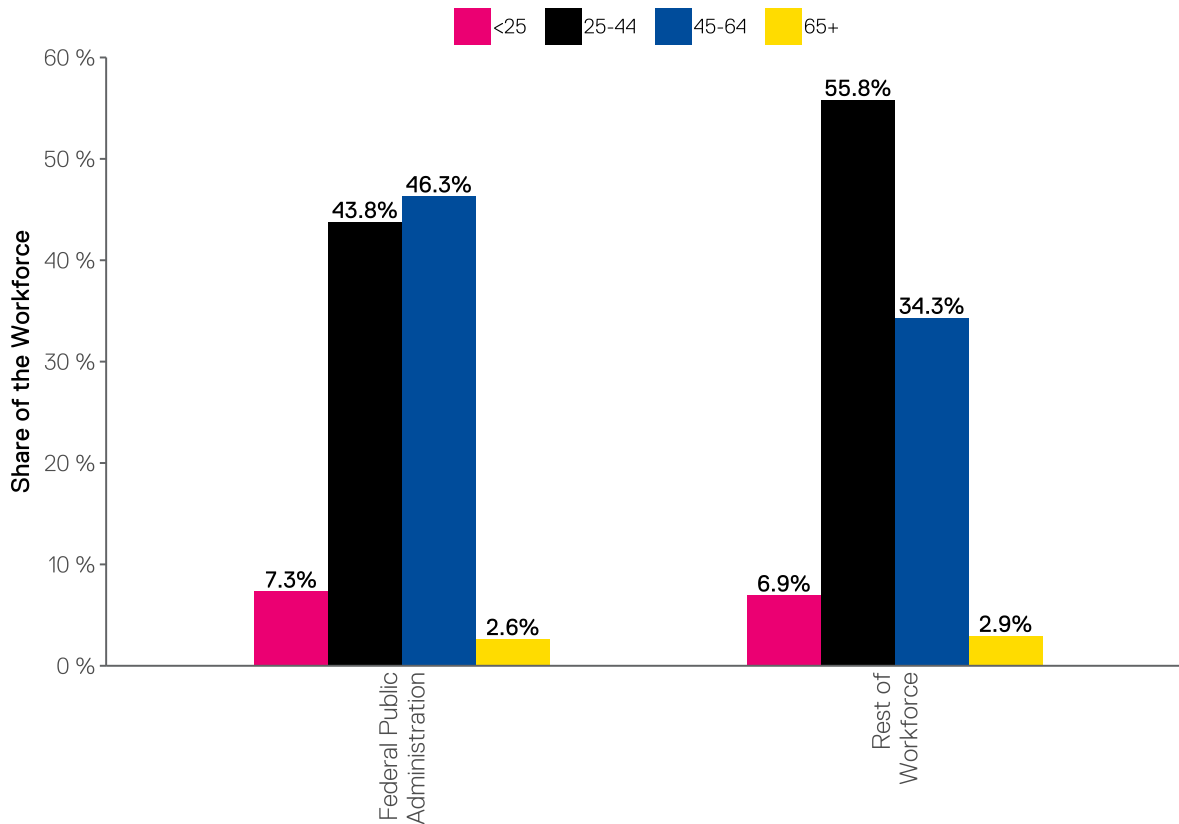
Figure 2: Workforce composition by gender



Source: 2021 Long Form Census

There is a significant gender imbalance, with men significantly overrepresented among federal tech workers (70 percent). This translates to a very different rate of participation in tech jobs for women and men within the federal government. While less than five percent of women in the federal public service are tech workers, more than 10 percent of men are (similar gaps exist across other levels of government). Yet the gender gap is smaller in the federal tech workforce than in the rest of Canada's tech workforce, where less than one-quarter of workers (22 percent) are women.

Figure 3: Workforce composition by age



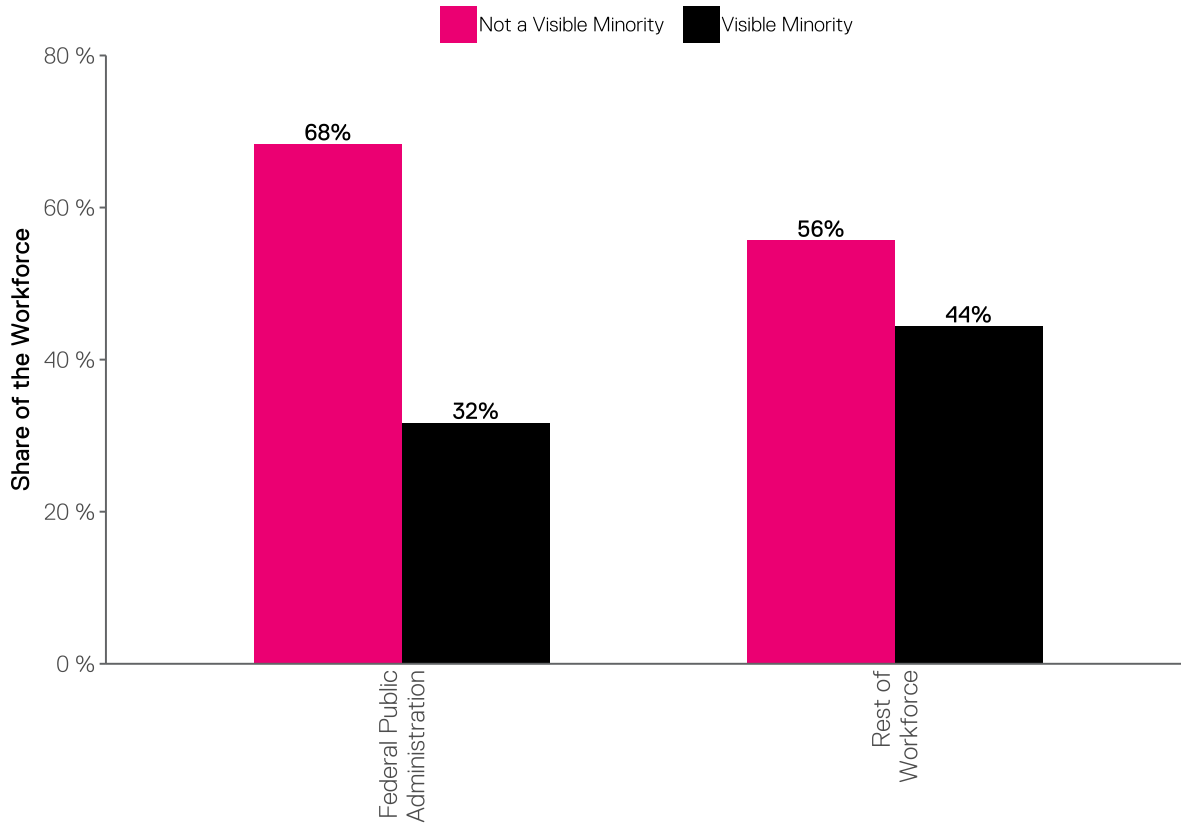
Source: 2021 Long Form Census

Federal tech workers tend to be older than in the rest of Canada's tech workforce. While the share of younger workers (under 25) is comparable, the share of federal tech workers in the 25 to 44 age range is 15 percent smaller (44 percent versus 56 percent) and is 12 percent larger in the 25 to 64 age range (46 percent versus 34 percent). A very small share of workers are over 65.



Federal tech workers tend to be older than in the rest of Canada's tech workforce.

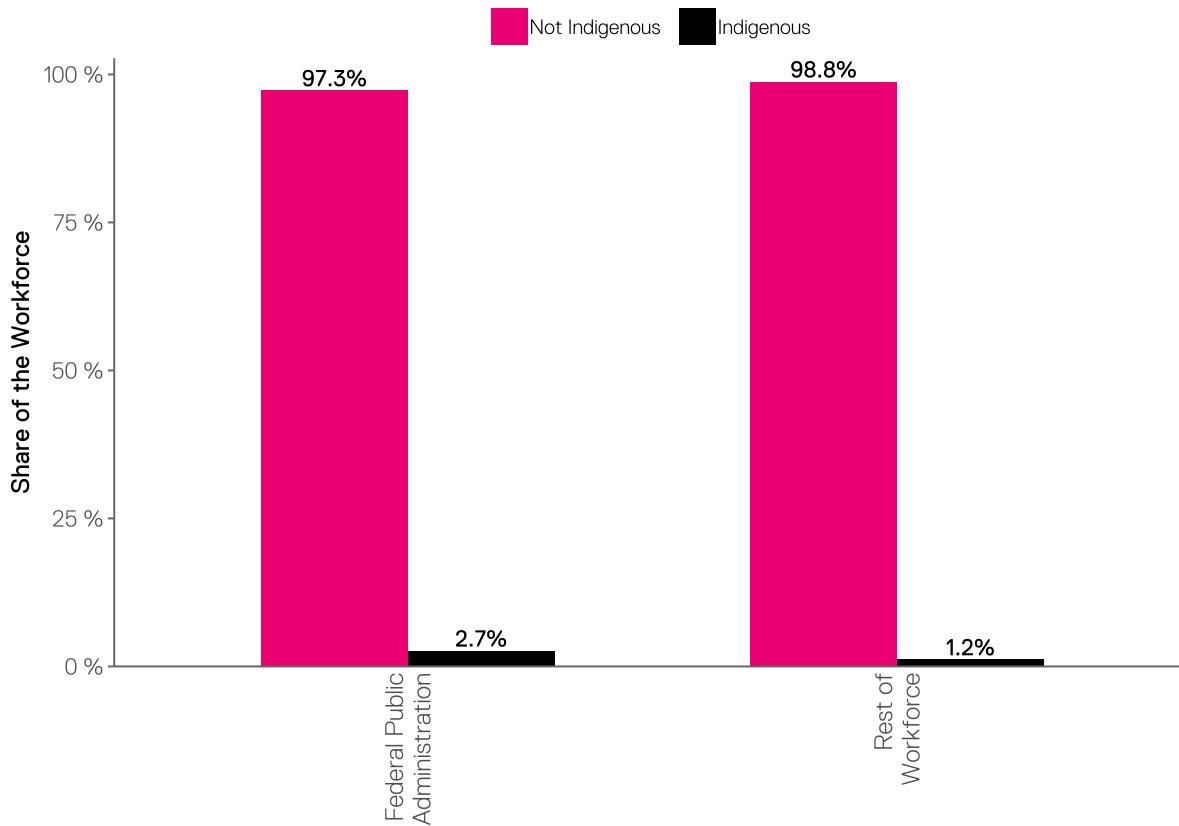
Figure 4: Workforce composition by visible minority identity



Source: 2021 Long Form Census

Federal tech workers are less likely to identify as a visible minority (only 32 percent identify as such) than workers in the rest of Canada's tech workforce (44 percent). Yet, visible minority workers in the federal public administration have a higher participation rate in tech work: 9.9 percent of visible minority workers in the federal public administration are in tech occupations while only seven percent of other workers are in tech.

Figure 5: Workforce composition by Indigenous identity



Source: 2021 Long Form Census

Figure 5 shows that a very small share of federal tech workers identify as Indigenous (2.7 percent), although this is more than double the share of Indigenous workers in the rest of the tech workforce (1.2 percent). Still, workers who identify as Indigenous are underrepresented in federal tech jobs. Only 4.1 percent of Indigenous workers in federal public administration are in tech occupations, compared with eight percent of the overall federal workforce.

Occupational breakdown of the technology workforce

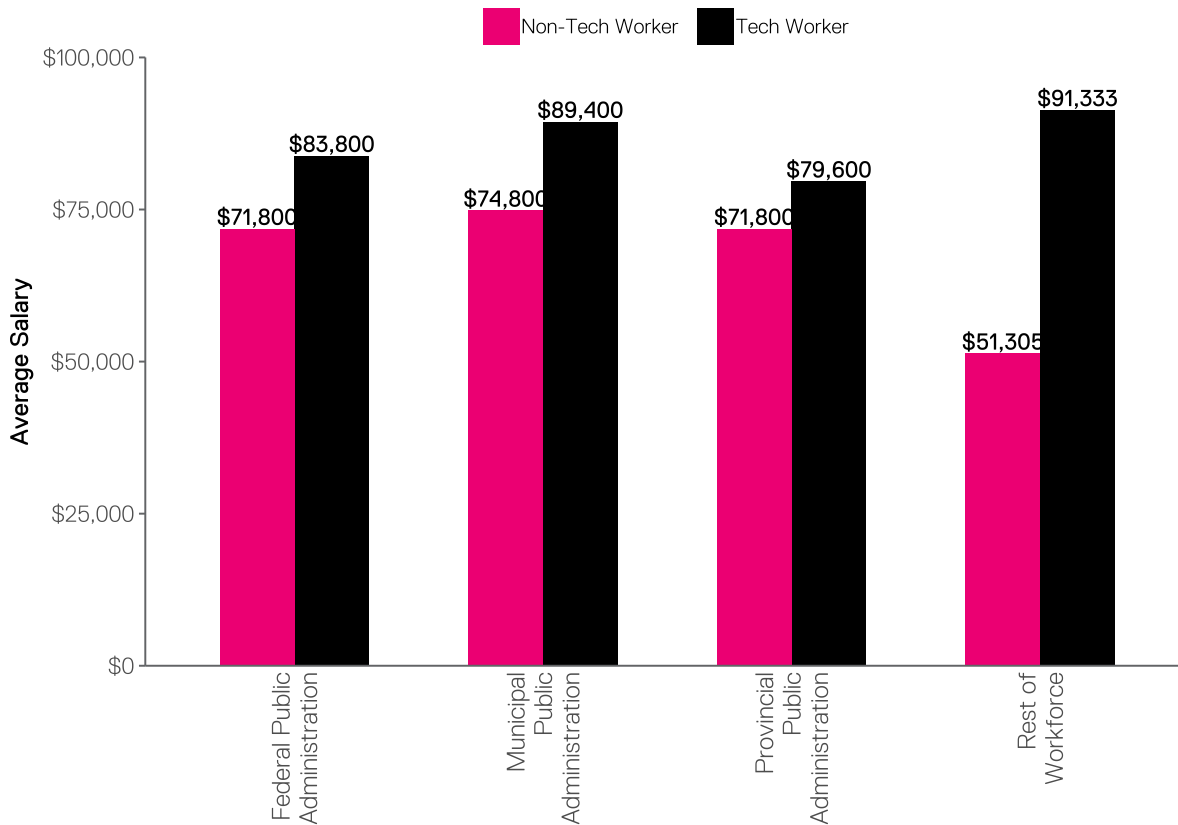
Table 2 shows the top 10 federal tech worker occupations by total number of workers. In total, the top 10 represent about 80 percent of the federal tech workforce. Compared with the rest of the tech workforce, there is a higher share of federal tech workers in IT-type roles (Information system specialists and managers, computer and web technicians, database analysts) that are typically maintaining and managing existing systems, and a lower share among software engineers, web developers, and programmers. There is also a significantly higher share of cybersecurity specialists than in the rest of the workforce, though they represent a small proportion of the federal tech workforce.

Table 2: 10 most common federal tech worker occupations

Occupation	# of federal tech workers	% of federal tech workers	% of rest of workforce tech workers	Difference
21222 - Information systems specialists	8,575	20.9	13.8	+7.1%
20012 – Computer and information systems managers	4,300	10.5	8.4	+2.1%
22220 – Computer network and web technicians	3,795	9.2	6.8	+2.4%
21230 - Computer systems developers and programmers	3,680	9.0	4.1	+4.9%
11101 - Financial and investment analysts	3,290	8.0	5.9	+2.1%
21223 – Database analysts and data administrators	2,470	6.0	2.4	+3.6%
21232 - Software developers and programmers	2,395	5.8	9.4	-3.6%
21234 - Web developers and programmers	2,180	5.3	5.6	-0.3%
21220 - Cybersecurity specialists	1,705	4.1	1.3	+2.8%
21231 - Software engineers and designers	1,180	2.9	9.1	-6.2%

Pay analysis

Figure 6: Average salaries by occupation



Source: 2021 Long Form Census

Federal tech workers, on average, earn salaries of \$83,800, which is \$12,000 higher than the average for other workers in federal public administration. This is slightly larger than the tech pay premium in provincial governments, and significantly smaller than the tech pay premium for other levels of government.

Federal tech workers, on average, earn salaries of \$83,800, which is \$12,000 higher than the average for other workers in federal public administration.

However, federal tech workers make nearly \$8,000 less than their counterparts in the rest of the workforce. Across the ten most common tech occupations in the federal public administration (Table 3), salaries are lower than the rest of the workforce for seven of the occupations. The largest average salary gaps—ranging from \$15,000 to \$55,000—are for financial analysts, software engineers and developers, and computer and information system managers. Seven occupations earn less than their counterparts in other industries, with four occupations on average earning more than \$10,000 less than their counterparts.

However, federal tech workers make nearly \$8,000 less than their counterparts in the rest of the workforce.

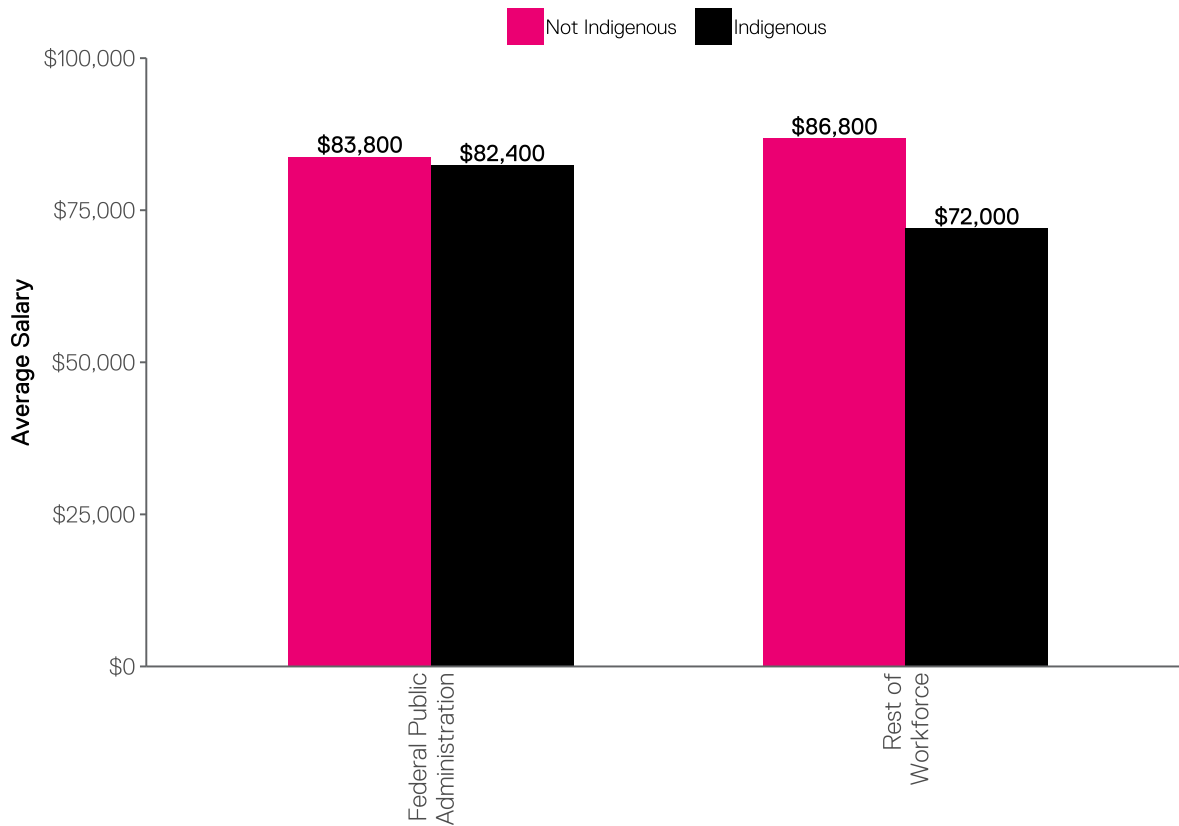
Table 3: Average salary for 10 most common tech worker occupations

Occupation	Federal public administration average salary (\$)	Rest of workforce average salary (\$)	Difference
21222 - Information systems specialists	85,655	83,172	+\$2,483
20012 – Computer and information systems managers	110,450	129,739	-\$19,289
22220 – Computer network and web technicians	76,680	65,879	+\$10,801
21230 - Computer systems developers and programmers	74,873	76,411	-\$1,538
11101 - Financial and investment analysts	84,596	139,722	-\$55,126
21223 – Database analysts and data administrators	73,727	74,754	-\$1,027
21232 - Software developers and programmers	71,239	86,667	-\$15,428
21234 - Web developers and programmers	69,178	60,781	+\$8,397
21220 - Cybersecurity specialists	91,866	96,095	-\$4,229
21231 - Software engineers and designers	81,964	107,487	-\$25,523

Other Dais research in the *Canada's Got Tech Talent* series has found that many equity-deserving groups are significantly underpaid compared to others in the field of tech work. Women, visible minorities, and Indigenous Peoples are all paid less than others doing tech work. For women in tech, this gap is on average \$20,000 less than men earn. Pay gaps are nearly as large for visible minorities and Indigenous Peoples.⁵

Women, visible minorities, and Indigenous Peoples are all paid less than others doing tech work.

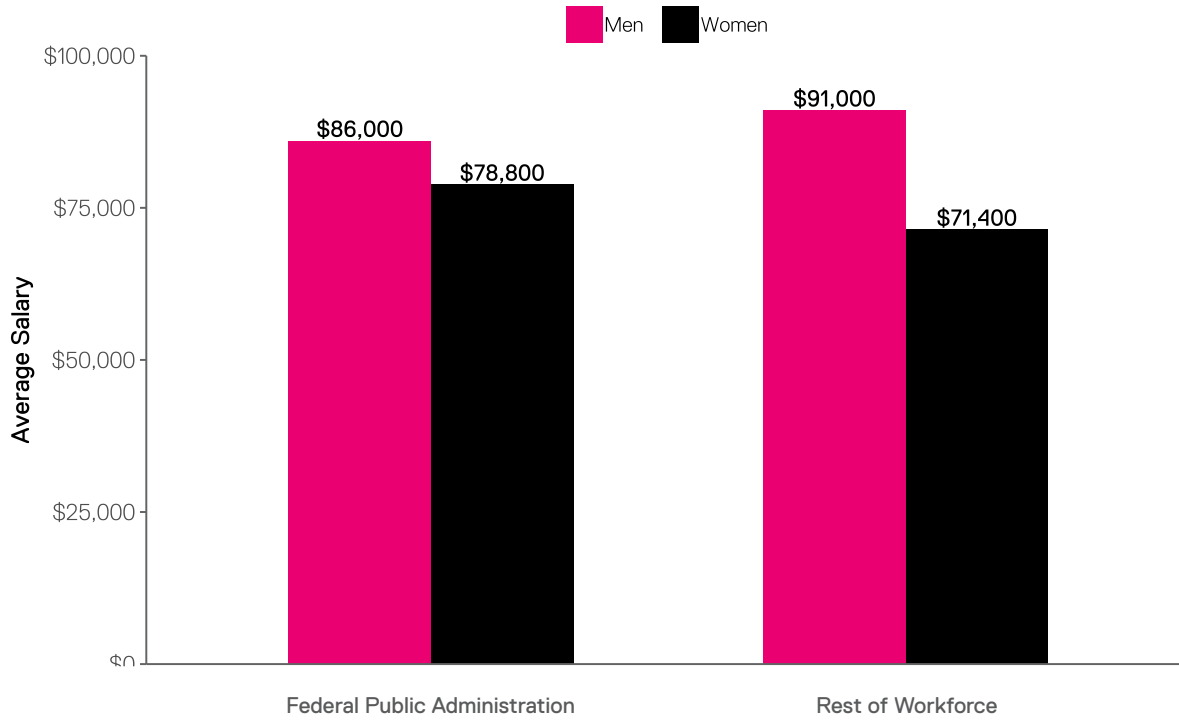
Figure 7: Tech salary by Indigenous identity



Source: 2021 Long Form Census

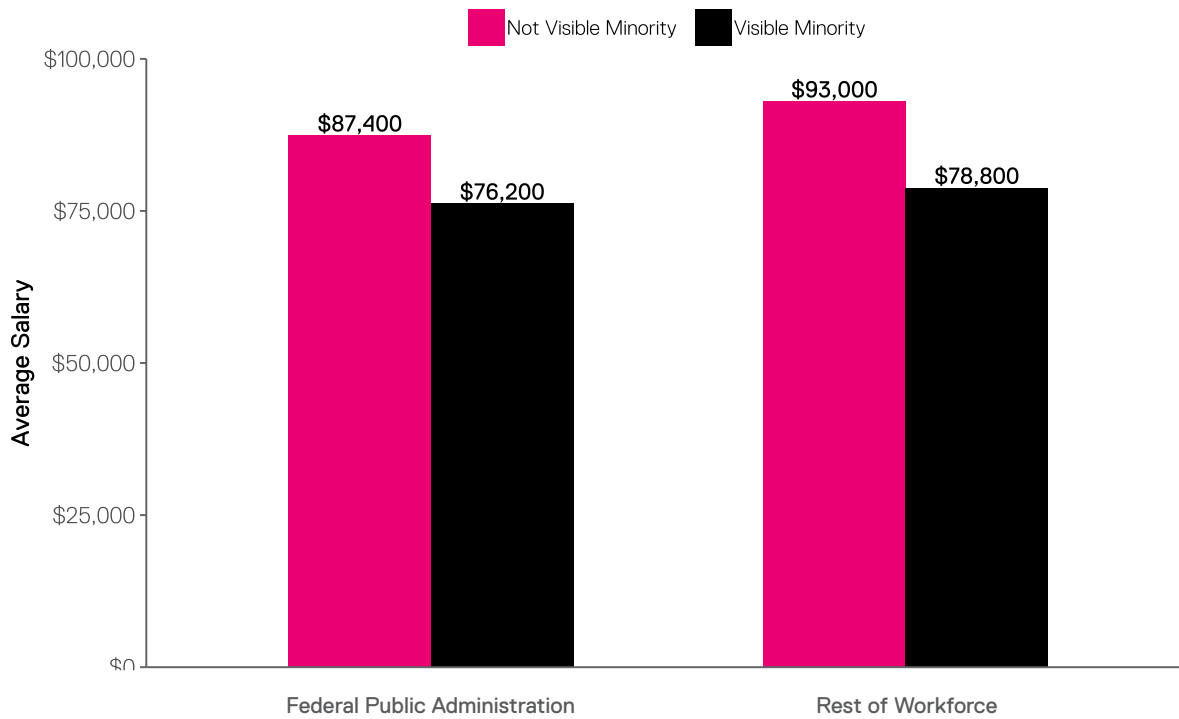
In the federal public administration, these gaps persist but are significantly smaller. Among all tech workers, Indigenous Peoples are paid on average \$14,800 less than other workers, but within the federal government's public administration, the gap is only \$1,400. The gender pay gap is larger. On average, women earn \$78,800, while men earn \$86,000—a difference of \$7,200. This is much smaller than the nearly \$20,000 pay gap that exists in the rest of the tech workforce, but is still far from equal. For those who identify as a visible minority, the federal pay gap is \$11,200 compared with \$14,200 for the rest of the tech workforce. While the disparity is smaller in the federal government, it nonetheless persists.

Figure 8: Tech salary by gender



Source: 2021 Long Form Census

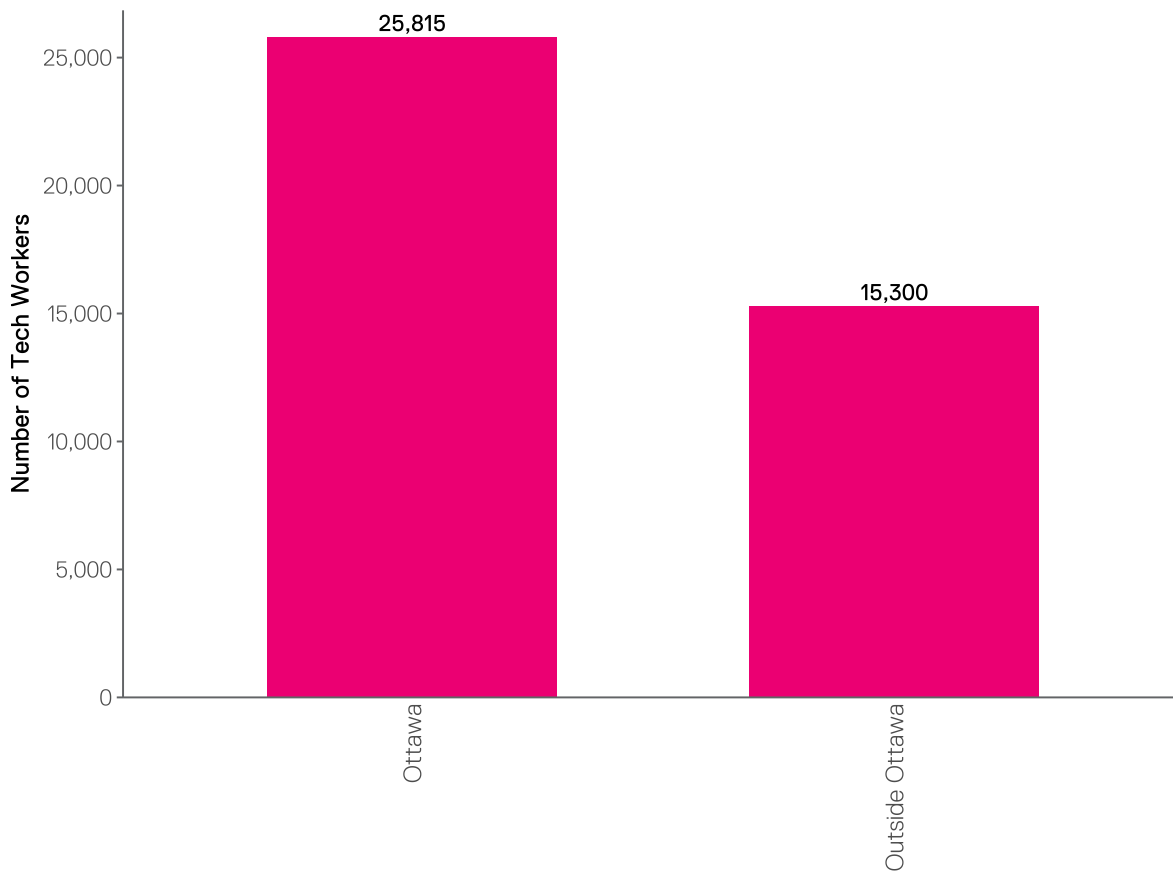
Figure 9: Tech salary by visible minority identity



Source: 2021 Long Form Census

Location of federal tech workers

Figure 10: Location of tech workers in federal public administration



Source: 2021 Long Form Census

While the federal government's public administration workforce is concentrated outside of Ottawa (with 70 percent of public administration workers being outside Ottawa), the tech workforce is not. About two-thirds of federal tech workers are in Ottawa (25,815), with only 15,300 outside the national capital. The concentration of tech workers is also far higher in Ottawa. Sixteen percent of federal workers in Ottawa are in tech occupations compared to only four percent of those outside Ottawa.

About two-thirds of federal tech workers are in Ottawa.

5

Implications


Canada's federal public administration workforce employs more than 40,000 people in high-skill tech occupations, accounting for 7.8 percent of its workforce. This is higher than the national average of 4.7 percent across all industries. However, this is still below more digitally-intensive industries in Canada such as data processing, hosting, and related services where it is common to have 15 percent or more of the workforce engaged in tech work.⁶

In general, the public administration tech workforce is more representative of Canada's population than the tech workforce in the private sector, but there remains work to do. Government tech workers are still disproportionately more likely to be men and less likely to identify as Indigenous. Beyond just composition, equity-deserving groups (including women, members of visible minority groups, and Indigenous Peoples) are paid less on average than their counterparts for tech work within the federal government.

On top of disparities within the federal government, tech workers as a whole in the federal public administration make less than tech workers in the rest of the economy. Tech workers in the federal government on average earn about \$7,500 less than in the private sector in base salary. This does not account for bonus and equity compensation that private sector workers could earn, which Dais research has estimated is around \$84,000 on top of their salary on average for tech workers.⁷ Nor does it cover non-salary benefits such as pensions, which tend to be better for public sector workers. Further research could assess, and compare, the total compensation of federal tech workers versus other sectors.

These pay differences are reflected in the most common tech occupations within the federal government. In general, the federal public administration has more workers in general IT roles like information system specialists, computer and information system managers, and computer network and web technicians (which collectively account for more than 40 percent of federal government tech workers). It has fewer workers in occupations like software engineers, web developers and programmers.

Future research would benefit from a deeper look into the areas of the federal government where tech work is more concentrated, including comparing core public administration against national security agencies and also looking within specific departments. Additionally, more qualitative work should be done to understand the existing working conditions for tech workers within the public administration and their levels of employee satisfaction.



Future research would benefit from a deeper look into the areas of the federal government where tech work is more concentrated, including comparing core public administration against national security agencies and also looking within specific departments.

Endnotes

- ¹ “Canada,” UN E-Government Knowledgebase, accessed January 14, 2025, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/31-Canada>.
- ² Angus Lockhart and Viet Vu, *Canada’s Got Tech Talent: Canada’s Tech Workers and Their Compensation*, The Dais, June 2024, <https://dais.ca/wp-content/uploads/2024/06/Canadas-Got-Tech-Talent-Chapter-01.pdf>.
- ³ “Canada,” UN E-Government Knowledgebase, accessed January 14, 2025, <https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/31-Canada>.
- ⁴ Creig Lamb, Daniel Munro and Viet Vu, *Byte-Sized Progress: Assessing Digital Transformation in the Government of Canada*, The Dais, September 2023, <https://dais.ca/reports/byte-sized-progress-assessing-digital-transformation-in-the-government-of-canada>.
- ⁵ Angus Lockhart and Viet Vu, *Canada’s Got Tech Talent: Diversity of Canada’s Tech Workers*, The Dais, June 2024, <https://dais.ca/wp-content/uploads/2024/06/Canadas-Got-Tech-Talent-Chapter-02.pdf>.
- ⁶ Angus Lockhart and Viet Vu. *Canada’s Got Tech Talent: Canada’s Tech Workers and Their Compensation*, The Dais, June 2024, <https://dais.ca/wp-content/uploads/2024/06/Canadas-Got-Tech-Talent-Chapter-01.pdf>.
- ⁷ Vivian Li, Mahmeh Hamza, Anusha Arif, *Mind the Gap: Compensation Disparity Between Canadian and American Technology Workers*, The Dais, October 2023, https://dais.ca/wp-content/uploads/2023/10/CanadaUSWageGap_V9.pdf.