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Retention of Information and Communications Technology (ICT) Graduates and Immigrants in New Brunswick

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Abbreviations and Definitions

AIP Immigrants	Immigrants arriving through the Atlantic Immigration Program (AIP)
ICT	Information and Communications Technology
ICT Graduates	Post-secondary graduates of public post-secondary educational institutions in NB who graduated from ICT-related programs
Matched Individuals	Individuals in New Brunswick's (NB) post-secondary graduate data sets or the Federal Immigration Database whose data can be matched to (or found in) the Citizen Data (i.e., the provincial Medicare registry). Inclusion in the Citizen Data indicates residence in NB and is used to estimate retention.
PNP Immigrants	Immigrants arriving through the NB Provincial Nominee Program (PNP)
Occupation	Immigrants' occupation under the National Occupational Classification (NOC) Level 1 (2011), indicated in the Permanent Resident Data and Transition Data, respectively
Official Languages Spoken	Official NB language (English, French, Both, None) as indicated by immigrants in the Permanent Resident Data
TR to PR Pathway Immigrants	Immigrants arriving through a limited-time Temporary Resident (TR) to Permanent Resident (PR) Pathway program (closed in November 2021).

Executive Summary

The Information and Communications Technology (ICT) sector plays an important role in driving economic activity and digital innovation across Canada. In New Brunswick (NB), demand for a highly educated ICT workforce and shifting labour market conditions underscore the need for clear evidence on how ICT workers enter the provincial labour force and the extent to which they remain in the province over time.

This study aims to provide that evidence using linked provincial administrative data from 2005 to 2023 to examine patterns of entry and retention among ICT graduates and skilled immigrants. Examining trends and dynamics in the ICT labour force, it addresses the following questions:

1) What are the graduation numbers and retention rates in NB of ICT graduates from the province's public post-secondary institutions?

2) What are the inflows and retention rates of permanent residents with ICT skills in NB?

3) To what extent are various demographic, geographic, and occupational factors associated with the supply and provincial retention of post-secondary ICT graduates and permanent residents with ICT skills in NB?

The report is part of a larger research program that uses linked provincial administrative data to investigate the trends and dynamics associated with the ICT labour force in NB. Complementary reports focus on the demand for workers in ICT-related sectors based on posted job vacancies (Emery et al., 2026), the supply and earnings of ICT-related workers (Jones et al., 2026b), and the potential for short-term work permits to provide longer-term ICT labour – through the transitions of temporary foreign workers to permanent residency (McDonald et al., 2026). Together, these reports aim to equip decision makers with an integrated evidence base on the province's ICT workforce landscape, supporting more effective workforce planning across NB.

Summary of Findings

ICT Graduates from Public Post-Secondary Institutions in NB

- Since 2015, universities have produced between 180-200 ICT graduates annually. While colleges previously had a lower number of ICT graduates, their numbers jumped significantly in 2018 and stayed elevated at around 200 ICT graduates per year.

- On average, individuals originally from NB constituted the majority of ICT graduates from both universities (50%) and colleges (78%). However, the proportion of college ICT graduates from outside Canada (international students) has risen markedly in recent years – growing from less than 10% of college ICT graduates to nearly 50% by 2021.

- Around 70% of university ICT graduates remain in the province one year after graduating, though retention declines to approximately 50% after five years and 41% after ten years.

- College graduates are more likely to remain in NB after graduation, with 88% remaining after one year and over 80% still living in the province after five years.

- Statistical analysis shows that for university ICT graduates, being from outside NB (i.e., being an international student or coming from another province) is the strongest predictor of leaving NB following graduation.

    - Conversely, international college graduates are significantly more likely to stay than college graduates from NB. However, it should be noted here that results may be impacted by the small counts of international graduates – most of whom were also very recent graduates whose subsequent retention is largely unobserved beyond one of two years.

Permanent Residents with ICT Skills in NB

- The number of ICT-skilled permanent residents arriving in NB has shown steady growth since 2021.

- The matching rate of these ICT-skilled newcomers – that is, the proportion who register for the provincial Medicare – is 88%, indicating that most of these primary applicants who apply to land in NB do move to the province after their application is approved.

- Among the economic class immigration streams, the Provincial Nominee Program is the primary immigration pathway for permanent residents with ICT skills, accounting for nearly two-thirds of ICT-related landings in NB.

- Recent landing cohorts show a marked increase in the number of French-speaking permanent residents with ICT skills, as well as an increase in their bilingual counterparts.

- Approximately two-thirds (68.7%) of permanent residents with ICT skills were still living in the province one year after landing.

- Statistical analysis reveals that ICT-skilled permanent residents who arrive in NB through the Temporary Residence to Permanent Residence Pathway and the Canadian Experience Class have a significantly higher likelihood of leaving NB than those who arrive through the Provincial Nominee Program.

Key Takeaways

NB has seen steady growth in the number of skilled individuals supplying its ICT labour force through both education and immigration pathways. The number of college ICT graduates in particular has risen notably – with international students now making up nearly half of recent college cohorts. Although university and college ICT graduates contribute meaningfully to the

ICT labour supply, their retention patterns vary: college graduates remain in NB at significantly higher rates than university graduates, and student origin also plays a role in shaping whether individuals stay or leave.

These dynamics are mirrored, though in different ways, among permanent residents with ICT skills. Immigration has become an increasingly important source of ICT talent, with high matching rates showing that a large share of ICT-skilled newcomers who apply to land in NB do arrive and settle down long enough to apply for provincial Medicare. However, permanent residents with ICT skills exhibit lower retention than immigrants in most non-ICT occupations, particularly in the short term. This suggests that ICT-skilled newcomers may face distinct labour market or mobility pressures that push them out of the province; or there may be economic pull factors that draw them towards opportunities in larger metropolitan centres. However, in the face of out-migration, the Provincial Nominee Program (PNP) stands out as a stabilizing force, having the largest number of arrivals and notably higher retention of ICT-skilled applicants than other economic class immigration streams.

Understanding which sources of ICT labour are most likely to stay – and under what conditions – offers important insight into the factors associated with long-term retention across both graduate and immigrant groups. For ICT graduates, ties to NB and program type appear to influence whether individuals remain in the province. For immigrants, the structure of immigration streams may play a similar role, with the PNP associated with stronger long-term settlement than other routes. Taken together, these patterns point to a labour supply that is growing but uneven in its longer-term stability. While recognizing positive outcomes (including a rise in international ICT students and strong PNP performance) we also see lower retention among university graduates and ICT-skilled immigrants in general. These findings emphasize the importance of both attraction and retention in supporting a more stable ICT workforce for the province.

Introduction

Information and Communications Technology (ICT) has become an important source of economic activity in Canada, supporting innovation in diverse fields far beyond the sector itself. Yet the distribution of this growth has been uneven, and New Brunswick (NB) has not shared equally in the sector's expansion.

While major metropolitan centres in Canada have attracted large concentrations of ICT professionals, smaller jurisdictions like NB continue to face challenges in meeting ICT labour demand. NB is faced with shifting labour market conditions that underscore the importance of understanding how ICT professionals enter the provincial labour force and whether they remain in the province over time.

This study investigates the dynamics of entry and retention within NB's ICT labour force, and how these patterns have evolved over time. Using linked administrative individual-level data from 2005 to 2023, we employ descriptive and statistical methods to address three main questions:

1) What are the graduation numbers and retention rates in NB of ICT graduates from the province's public post-secondary institutions?

2) What are the inflow numbers and retention rates of permanent residents with ICT skills in NB?

3) To what extent are various demographic, geographic, and occupational factors associated with the supply and provincial retention of post-secondary ICT graduates and permanent residents with ICT skills in NB?

The results are intended to equip decision makers with timely, actionable, evidence-based insights into the supply and retention of highly skilled ICT workers in NB – insights which can help address workforce gaps and strengthen the province's capacity for digital transformation.

Background

Canada's Information and Communications Technology (ICT) sector experienced robust workforce expansion through the 2010s, outpacing general employment trends. From 2011 to 2016, ICT employment increased at 2.38% annually, more than double the 1.17% rate observed in other economic sectors. The reach of ICT professionals extends well beyond technology-specific companies, with these workers becoming integral to diverse industries including manufacturing, electrification, and financial services, as organizations advance their digital capabilities and communication systems. By 2016, just over half (53%) of ICT professionals worked outside traditional ICT industries, with projections suggesting this proportion would climb to 84% by 2021 (Liu & McDonald-Guimond, 2021). However, following a pandemic-driven hiring surge in 2020-2021, Canada's ICT sector experienced substantial layoffs between 2022 and 2024 as companies adjusted to post-pandemic demand and tighter financing conditions (Lindstrom, 2025).

This national growth pattern has not been uniformly distributed provincially. For example, the majority of ICT employment gains between 2009 and 2016 took place in Ontario and Quebec. During this same period, New Brunswick recorded a -3.8% decline in ICT employment, making it – alongside Nova Scotia, which had a decline of -1.1% – one of only two provinces experiencing negative sector growth.

It is possible that some of the ICT workforce challenges in NB could be due to the scarcity of major metropolitan areas in the province. ICT professionals demonstrate high geographic mobility and economic pull toward large urban centres. Whereas cities like Toronto and Vancouver successfully attract skilled talent by providing broader career pathways and vibrant metropolitan amenities, this concentration effect presents obstacles for smaller jurisdictions seeking to develop robust talent pools and secure investment capital. Nevertheless, regional centres in NB – such as Fredericton, Moncton, and Saint John – could have the capacity to attract and retain ICT professionals. Research examining ICT workers in smaller urban areas has identified existing social connections within these communities as a key factor influencing decisions to remain in the region (Hartal et al., 2021).

Projections from 2021 estimated a 2% employment growth rate for NB's ICT sector moving forward (ICT Council, 2021). As predicted, during the tech boom of the post-COVID-19 pandemic period (2021-2023), NB saw a substantial increase in the number of vacancies for Computer and Information Systems Professionals,[1] peaking at approximately 130 vacancies in the first quarter of 2021 and averaging 85-88 vacancies per quarter across 2021 and 2022. However, through 2024 and 2025, the ICT labour market cooled considerably, and the number of vacancies for Computer and Information Systems Professionals returned to pre-pandemic levels. The province averaged approximately 41 vacancies per quarter in 2025, for example, which is similar to the average of ~50 observed in 2019 (Statistics Canada [StatCan], 2026).

Recent nationwide layoffs in the tech sector and a return to more typical hiring patterns have also created a more challenging environment for new graduates entering the workforce (Reid, 2025), with demand increasing primarily for more experienced candidates (MacFarlane, 2025). Data from Statistics Canada show that a large share of ICT-related demand in the province has been for highly skilled, highly educated ICT professionals. In 2023, for example, 42.3% of vacant jobs in the Computer and Information Systems Professionals category required bachelor's-level credentials, while 36.2% required college-level certification. These rates are substantially higher than the share of bachelor's-level (11.1%) and college-level (24.7%) requirements observed across all occupations as a whole (StatCan, 2023). These shifts indicate that employers are increasingly seeking candidates with advanced technical training and more specialized skills.

The earnings patterns of ICT graduates in New Brunswick reinforce this trend. A corresponding DataNB study that used linked administrative data to examine the employment and earnings outcomes of ICT graduates in NB shows that, one year after graduation, university ICT graduates working in the province earn an average of $54,820, compared to $38,489 for college graduates – a difference of around $16,000. Five years after graduation, this gap widens further: university graduates working in NB earn an average of $81,873, while college graduates earn $54,294 – a

[1] National Occupational Classification (NOC) code 2122 (Government of Canada [GoC], 2023).

difference of around $28,000 (Jones et al., 2026b).[2] These differences are indicative of an ICT labour market that is more strongly oriented toward higher-credentialed candidates, as reflected in their earnings potential.

Addressing these challenges requires a clearer understanding of the pathways through which ICT workers enter the province's labour force. When domestic labour supply fails to satisfy sectoral demand, three principal talent sources can address the gap:

- Graduates from provincial post-secondary institutions (including international students).
- New arrivals from abroad.
- Interprovincial migrants.

Focusing on the domestic graduate pool, existing analyses shed light on how many graduates from NB's post-secondary institutions remain in the province after completing their studies. A recent study by DataNB utilizing provincial post-secondary graduate data and Medicare Registry records found that, on average, roughly two-thirds of Information Technology (IT) graduates from provincial universities stay in NB during the first year following graduation. This proportion drops considerably over longer periods, however, with approximately 40% and 29% still residing in the province at the five- and ten-year marks, respectively (Beykzadeh et al., 2025).

The retention picture differs notably for college-level IT graduates, as only about half remain in the province one year after completing their programs. This lower initial retention among college graduates may be attributable to the rising share of international students enrolled in IT programs at the college level (Beykzadeh et al., 2024), as DataNB's studies have consistently demonstrated that graduates who previously lived in NB are much more likely than international and out-of-province students to stay in the province after graduation (Beykzadeh et al., 2024). These findings suggest there is potential value in encouraging NB youth toward ICT-related educational pathways.

Immigration has also served as a longstanding Canadian strategy for addressing workforce gaps, with the ICT sector consistently employing a higher proportion of immigrants than other industries. In 2015-2016, immigrants comprised 42% of ICT workers, compared to just 26% of the non-ICT workforce (Thomson et al., 2018).

New Brunswick's workforce strategy has similarly emphasized immigrant attraction and retention (Techimpact and Jupia Consultants, Inc., 2022), necessitated by two decades of net population outflows to other provinces among working-age residents. This strategy appears to have been effective, given the net population growth being driven by in-migration observed in recent population and demographic research by DataNB (Beykzadeh et al., 2025).

Other prior research by DataNB found that overall immigrant retention in NB averages approximately 67% over three years, but retention among immigrants in the Federal Skilled Workers stream (a common entry pathway for ICT professionals) drops to only 56%. Among

[2] These results are based on data from 2010-2021 for university graduates and 2015-2021 for college graduates, with income presented in 2021 constant dollars.

Natural and Applied Sciences[3] workers specifically, the 3-year retention rate is slightly better at 61.5% (McDonald & Miah, 2021).

Although previous DataNB studies have examined retention among post-secondary graduates and immigrants in NB, these analyses have focused on broad fields of study or overall immigrant cohorts rather than ICT-specific pathways. As a result, little is known about how graduates trained in ICT-related disciplines, or immigrants with ICT skills and experience, move into and through the NB labour force. To address this gap, our study provides a comprehensive analysis of workforce and retention patterns among ICT graduates and skilled immigrants in NB, addressing the critical needs of the ICT sector.

[3] ICT is a subset of Natural and Applied Sciences within the National Occupational Classification structure (Government of Canada, 2023).

Data and Methodology

Data

The administrative data sets used in this analysis were accessed through DataNB and are listed in **Table 1** below.

Table 1: Data and Year Ranges

Data Type	Years Available
Medicare Eligibility and Status of Residents	
Citizen Data (Medicare registry)	2005-2024
NB Graduation Data	
NB University Graduates	2004-2022
CCNB Student Data	2014-2021
NBCC Student Data	2014-2021
NBCCD Student Information	2015-2022
Federal Immigration Database	
Permanent Resident Data	2005-2023

As the sole administrative data custodian for the province of NB, DataNB holds and manages pseudonymous (i.e., de-identified), person-level administrative data sets in the service of population research. All data sets have unique identifying codes for individuals that allow for matching (or linking) across data sets while protecting individuals' privacy. For example, individuals in the NB University Graduates data set are matched to their records in the Citizen Data by the NB Department of Health based on their name, gender, and birth date. All data sets are stripped of names, addresses, and other personal identifiers before being transferred to DataNB for analysis.

In some cases, individuals cannot be matched between data sets. This occurs when values are missing from identifying code fields in one or more of the source data sets. Unmatched records can occur either because an individual left NB before they could establish Medicare eligibility (and therefore are absent from the Citizen Data), or possibly because of mismatched or incomplete information in one of the records (e.g., a different spelling of a name).

Immigration Data

The Permanent Resident Data (also known as IRCC Landing Records) is a federal database provided by Immigration, Refugees and Citizenship Canada (IRCC). It includes landing records for all individuals approved for permanent residency in Canada – both primary applicants and their dependents. The data contain information such as landing dates, immigration stream,

country of prior citizenship, occupation (based on 2016 National Occupation Classification [NOC] codes; Government of Canada, 2023), and official language proficiency. The database ranges from 1985 to 2023. To meet data disclosure requirements, some estimates are presented using pooled years (2005-2023). Our year-to-year analysis is limited to 2004 onward.

Post-Secondary Education Data

This study's observations of individuals who graduated from public universities and colleges in NB are taken from multiple post-secondary education data sets.

The NB University Graduates data set is provided by the Maritime Provinces Higher Education Commission (MPHEC), which consolidates information from the province's four publicly funded universities into one source. The four public universities in NB include Mount Allison University (MTA), Université de Moncton (UMoncton), the University of New Brunswick (UNB), and St. Thomas University (STU). The community college data – CCNB Student Data, NBCC Student Data, and NBCCD Student Information – come directly from the province's three publicly colleges: Collège communautaire du Nouveau-Brunswick (CCNB), New Brunswick Community College (NBCC), and the New Brunswick College of Craft and Design (NBCCD).

These data sets include details such as graduation dates, immigration status, gender, education level (undergraduate, graduate, certification), field of study, program completion status, and permanent province of residence.

It is important to note that these data sets only cover graduates from public universities and colleges in NB and exclude graduates from other provinces or private institutions in NB. Our analysis only includes years for which these institutions collected one full calendar year of data.

Citizen Data

The Citizen Data is a longitudinal administrative database that provides information on NB residents' eligibility for provincial health coverage (Medicare) and their Medicare status. The database indicates whether an individual – such as an immigrant or a post-secondary graduate – continues to live in the province or has left, as well as the duration of their stay in NB. The Citizen Data also provides demographic and geographic details about the sample of interest, such as sex, age, and place of residence (i.e., Census Metropolitan Area). For this study, we use Citizen Data records covering the period from the beginning of 2005 until the end of 2024.

Methodology

NB ICT Graduates

To flag ICT graduates from public universities and colleges in the province, we use the 2021 Classification of Instructional Programs (CIP) codes (Government of Canada, 2022) related to

the Information and Communication Technology (ICT) field, which includes graduates in programs such as Computer and Information Sciences, Information Science/Studies, Computer Engineering Technology/Technician, and similar programs. The full list of CIP codes and program names is available in Table 27 in Appendix A.

This study examines the graduates of four of the public post-secondary institutions in NB that offer programs related to ICT. These include two universities (UNB and UMoncton) and two colleges (NBCC and CCNB). While MTA also offers a few programs related to ICT, the number of MTA's ICT graduates is considerably lower than other public institutions in the province, and as such it is not considered in our analysis. Data on graduates from private post-secondary institutions were not available at the time of analysis.

ICT graduates are categorized based on their origin (previous residence) and their visa status prior to enrolment in one of the post-secondary institutions in NB. Thus, domestic students with NB as prior residence are defined as NB graduates, while domestic students from other provinces are flagged as out-of-province graduates. Students in Canada on study permits (student visa) are defined as graduates from outside Canada (i.e., international graduates).[4]

Educational level is split into three categories: college degree (obtained from NBCC or CCNB), undergraduate degree, and postgraduate degree. Only the highest degree obtained by an individual is included in our calculations to avoid double counting.

Permanent Residents

In this study, we also examine the characteristics and retention of ICT-skilled individuals who immigrated to NB as permanent residents (PRs) from outside Canada without having previously held a study permit in the province. To flag permanent residents with ICT skills, we use National Occupational Classification (NOC) codes related to ICT occupations as stated on permanent residency applications. The full list of ICT-related NOC codes and descriptions used in this study is provided in Table 28 (Appendix A).

> *It should be noted that a complementary report by DataNB examines an earlier stage in the ICT immigrant talent pipeline: the transition from temporary work permit to permanent residency among temporary foreign workers with ICT skills.*

Our PR sample is limited to primary applicants who initially intended to settle in NB, based on the reported destination on their application. Individuals who indicated a different province as their intended destination are excluded from the analysis due to small counts.

[4] The ability to live and work in NB after graduation is contingent on securing a temporary work permit or permanent residency, and pathways to doing so can affect subsequent retention outcomes. For more information on this, see the DataNB study, *Transition to permanent residency and retention in New Brunswick of international students and temporary foreign workers* (McDonald & Miah, 2025).

The study disaggregates permanent residents into various categories both in the descriptive statistics and in the retention analysis, including country of citizenship, immigration stream, and NOC codes within the ICT field.

Provincial Retention Rates

An individual is considered to have left NB if their eligibility status in the Citizen Data is recorded as "Left the Province" or "Left Country." Individuals whose status was "Terminated" for reasons other than death are also considered to have left the province if their status remained unchanged for at least six months.

Graduates and permanent residents who could not be matched to the Citizen Data (provincial Medicare) are assumed to have left NB after graduation or after landing in NB as an immigrant.

For ICT graduates, we use graduation dates as a reference point for each graduate. If an individual remained in NB beyond a given window of time, they are considered retained. For example, a graduate who is identified in the Citizen Data as having an "Active" Medicare status in NB three years after their graduation would be considered retained in our calculations of 3-year retention rates. The following formula demonstrates how we calculate 1-year retention rates, using the 2015 graduate cohort as an example:

$$1-year\ Retention\ Rate\ 2015\ Graduate\ Cohort = \frac{Retained\ graduates\ in\ 2016}{Total\ graduates\ in\ 2015}$$

Retention of permanent residents with ICT skills is measured from the date of landing as recorded in the IRCC Permanent Resident Data until their departure from the province as indicated in the Citizen Data (i.e., duration of stay). Similar to the formula above, the following formula demonstrates the calculation of 1-year retention using the 2015 PR cohort as an example.

$$1-year\ Retention\ Rate\ 2015\ PR\ Cohort = \frac{Retained\ PRs\ in\ 2016}{Total\ PR\ landings\ in\ 2015}$$

To protect confidentiality, and in accordance with minimum disclosure requirements, all counts in this study are randomly rounded to the nearest 5.

Statistical Analyses

To complement the descriptive statistics, we also conduct a statistical analysis of outcomes, allowing us to disentangle various factors that may potentially affect the retention rates of graduates and immigrants in ICT-related fields in NB.

Multivariate Logistic Regression

We use multivariate logistic regression to examine factors associated with retention of ICT graduates from NB post-secondary institutions one year after graduation. We conduct two separate models for university and college graduates and consider factors such as gender, age at graduation, level of education, origin or previous residence, and graduating institution.

Cox Proportional Hazard Model

We use a Cox Proportional Hazards (CoxPH) model to analyze factors that influence the duration of residence in NB for permanent residents with ICT skills. This model estimates the risk of ICT immigrants leaving NB at any given time while accounting for multiple factors simultaneously – such as their age at landing, gender, year of landing, immigration stream, ICT occupation (NOC codes), official language, and country of citizenship.

Technical details of both models are included in Appendix B.

Limitations

The study's analysis is limited to ICT graduates from public post-secondary institutions in NB and does not account for graduates from private institutions in the province. The education choices of NB residents who obtained credentials in ICT-related programs outside the province or country cannot be observed and are therefore also excluded from the sample of ICT graduates.[5]

The immigrant sample includes only permanent residents who listed NB as their intended destination on their application. Permanent residents who intended to settle in another province and later moved to NB are not captured. For instance, a permanent resident who listed Ontario as their intended destination would be excluded, even if they later relocated to NB.

[5] In a companion paper titled *Labour supply and skill shortages in the New Brunswick Information and Communications Technology (ICT) Sector*, we consider the retention and employment outcomes of individuals graduating from public institutions anywhere in Canada.

Results

ICT Graduates from Post-Secondary Institutions in NB

Table 2 shows the number of ICT graduates from post-secondary institutions in NB who completed their programs between 2010 and 2022.

Table 2: Number and Matching Rate of ICT Graduates

Graduation Year	University			College		
	Total	Matched	Matching Rate	Total	Matched	Matching Rate
2010	130	95	73.1%	NA	NA	NA
2011	125	80	64.0%	NA	NA	NA
2012	145	100	69.0%	NA	NA	NA
2013	140	80	57.1%	NA	NA	NA
2014	145	105	72.4%	100	95	95.0%
2015	190	130	68.4%	75	75	100.0%
2016	185	130	70.3%	120	115	95.8%
2017	200	160	80.0%	125	125	100.0%
2018	175	150	85.7%	200	195	97.5%
2019	185	155	83.8%	160	160	100.0%
2020	195	170	87.2%	210	200	95.2%
2021	220	195	88.6%	220	215	97.7%
2022	190	170	89.5%	NA	NA	NA
Total	**2225**	**1720**	**77.3%**	**1210**	**1180**	**97.5%**

Among more recent cohorts (2015-2022), the annual number of university ICT graduates generally ranged from 180 to 200.

On average, 77.3% of these university ICT graduates could be matched to the Citizen Data (NB Medicare registry), with some yearly volatility. From 2017 on, however, the university matching rate reached 80% and continued to increase almost every year, peaking at 89.5% in 2022. The higher matching rate starting in 2017 was likely due to international students becoming eligible for provincial Medicare in that year.

University-level ICT graduates accounted for an average of 4.1% of all university graduates in NB over the 2010-2022 period (see Table 29 in Appendix A). The share remained relatively stable at

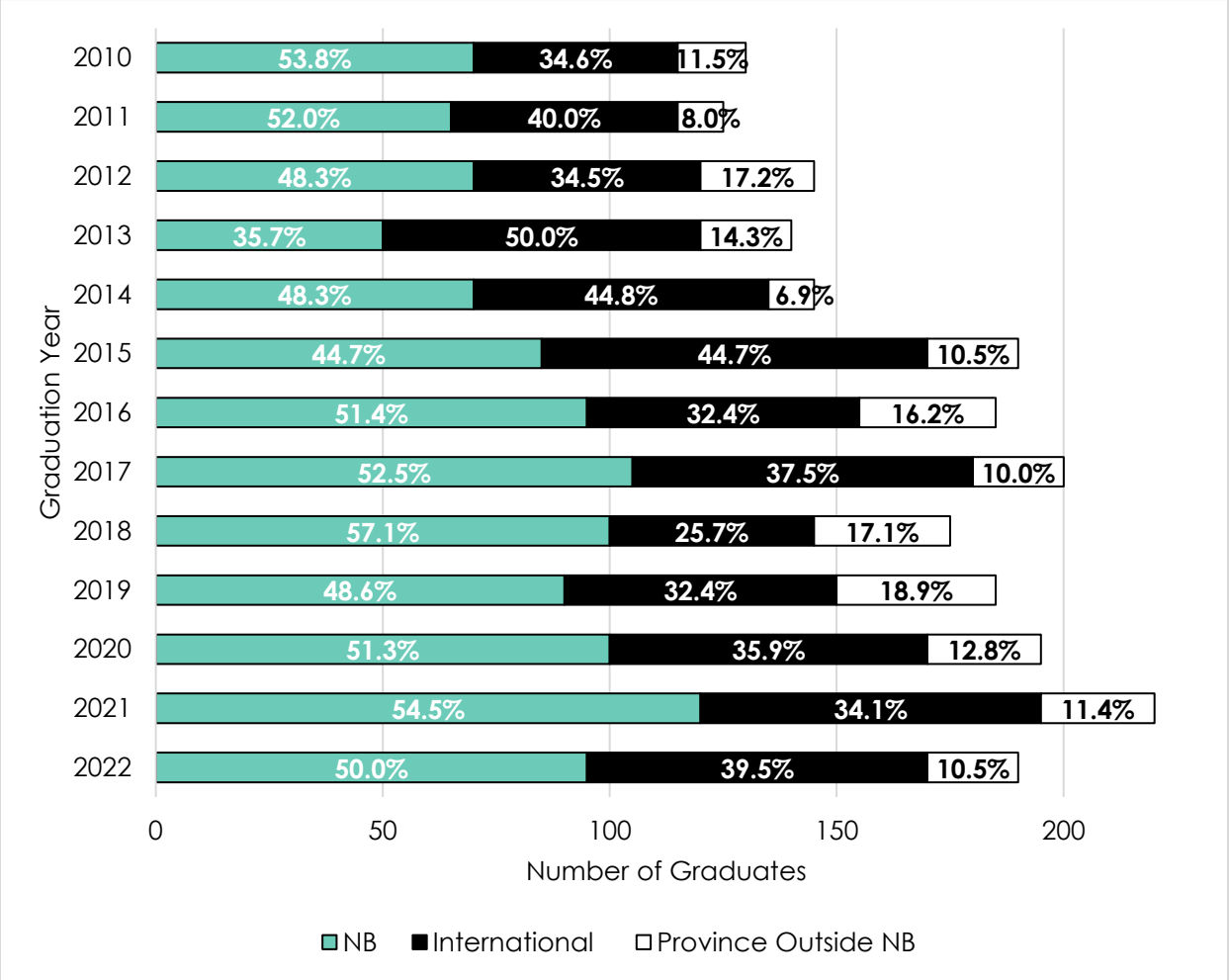
around 3% over the 2010-2014 period before increasing steadily, reaching its highest point (5.4%) in 2021.

Meanwhile, the number of college ICT graduates underwent a notable jump from 125 in 2017 to 200 in 2018, with counts mostly staying within that range for the next three cohorts (up to 2021). The matching rate for college graduates remained consistently high, with an average of 97.5%. The higher matching rate in the earlier years (pre-2017) was likely due to a significantly higher proportion of students originally from NB (presented in Table 2).

On average, college ICT graduates represented 4.5% of all college graduates in NB between 2014 and 2021. The share remained relatively stable (between 2.5% and 3.8%) from 2014 to 2017 before increasing, reaching 5.8% in 2018 and peaking at 5.9% in 2020 and 2021 (see Table 29 in Appendix A).

Figure 1 disaggregates the number of university ICT graduates based on their residence prior to enrolment.

Figure 1: Number of University ICT Graduates by Previous Residence

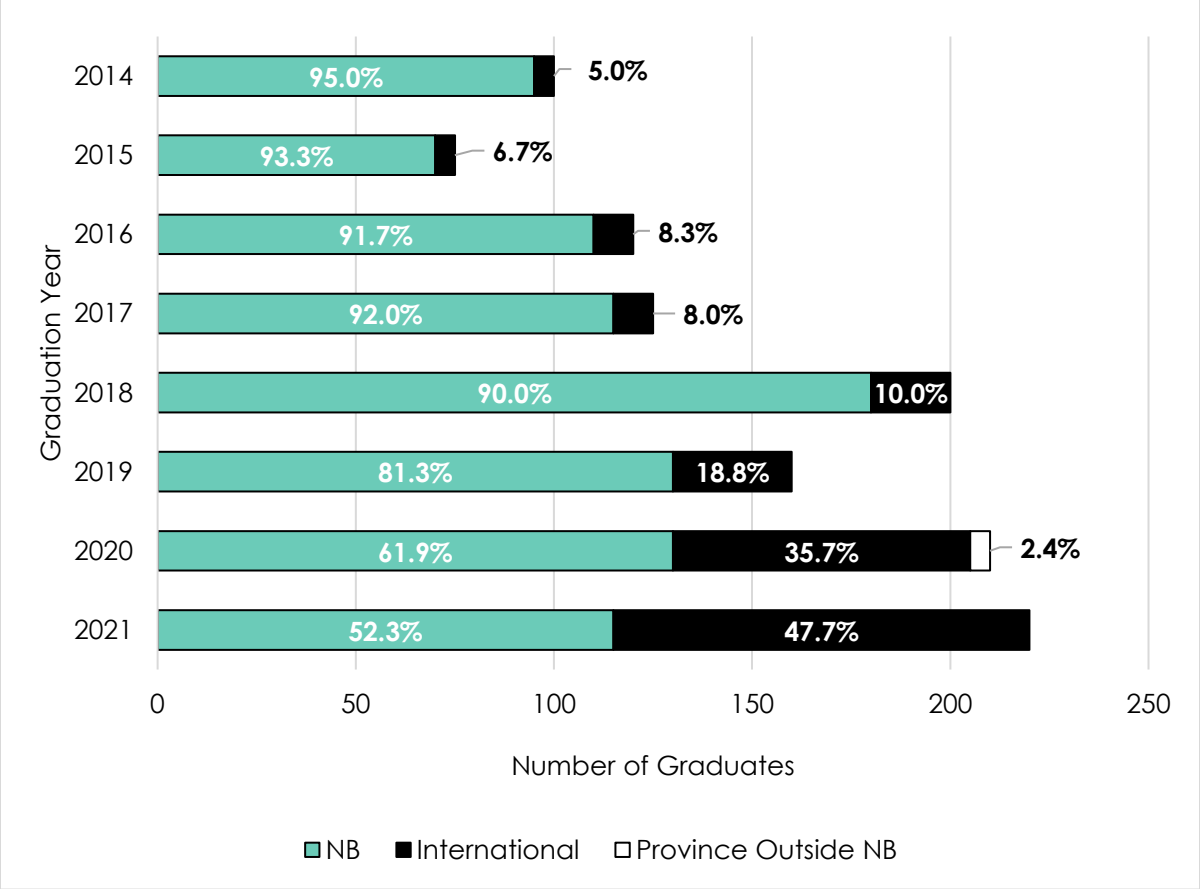


On average, from 2010 to 2022, graduates who were originally from NB accounted for half (50.1%) of university ICT graduates, followed by international graduates (37.1%) and individuals who came to NB from other Canadian provinces (12.8%). Graduates from NB remained the dominant and most stable residence category, consistently representing the majority of graduates nearly every year and showing only moderate fluctuations – with one notable exception. In 2013, the share international graduates surpassed the share of graduates from NB to account for 50.0% of the graduating cohort. This was the highest share for the international graduate category, which demonstrated more variability and underwent a general downward trend in later years.

In Table 30 in Appendix A – which presents the share of ICT graduates among all post-secondary graduates in NB (i.e., from all college and university programs) – results vary considerably based on students' previous residence. Among university graduates, international students had the highest representation in ICT programs, averaging 9.9% over the study period. In comparison, only 3.2% of university graduates from NB were in ICT fields, while university students from other Canadian provinces had the lowest share at 2.4%.

Figure 2 similarly breaks down the number of ICT graduates based on their residence prior to enrolment – this time focusing on college graduates only.

Figure 2: Number of College ICT Graduates by Previous Residence



On average, from 2014 to 2021, the majority (78.1%) of college ICT graduates were from NB, while international graduates represented 21.5% of cohorts. The share of graduates from other Canadian provinces was negligible at 0.4%.

Figure 2 shows a striking and consistent inverse trend over time: the share of graduates from NB was especially high in the earlier years, exceeding 90% from 2014 to 2016, and then underwent a clear and steady decline to 52.3% by 2021. Correspondingly, the share of international students was very low initially (around 5-8%) but rose substantially over the period, reaching 47.7% in 2021.

This indicates a major shift in the ICT graduate composition, moving from cohorts that were overwhelmingly comprised of NB-born graduates to cohorts split nearly equally between NB and international graduates by the end of the period.

> **Overall, the number of ICT graduates increased markedly for both universities and colleges over the study period, with almost all growth in the college sector due to the presence of international students.**

In Table 30 (Appendix A), we see that 7.3% of all international college graduates were in ICT programs, compared to 4.2% of all college graduates from NB and less than 1% of all graduates from other provinces. The ICT share among international graduates grew notably over time, rising from 3.0% in 2014-2015 to 9.5% by 2021. In contrast, the ICT share among graduates from NB increased more gradually, from around 3% in 2014 to approximately 4-5% in recent years.

> **At both the college and university level, the share of ICT graduates was highest among international students, with 7.3% of all international college graduates and 9.9% of all international university graduates having completed an ICT program.**

Figures 3 and 4 below present the number and share of university and college ICT graduates by gender, showing that at both levels, males constituted the majority of ICT graduates.

> **The overwhelming majority of ICT graduates have been male. On average, male graduates accounted for 82.2% of university ICT graduates and 83.5% of college ICT graduates, with females comprising the remaining 17.8% (university) and 16.5% (college).**

While the share of males never fell to less than 76.9% of university ICT graduates in any given year, the female share demonstrated moderate variability across the study period, dipping as low as 10% in 2013. However, in recent cohorts (2019-2022), females accounted for more than one-fifth of university ICT graduates. In contrast, female college ICT graduates accounted for over one-fifth of college graduates in the earlier years examined (2014-2016), and their share ranged from approximately 10-18% in the more recent 2018-2021 period.

Figure 3: Number of University ICT Graduates by Gender

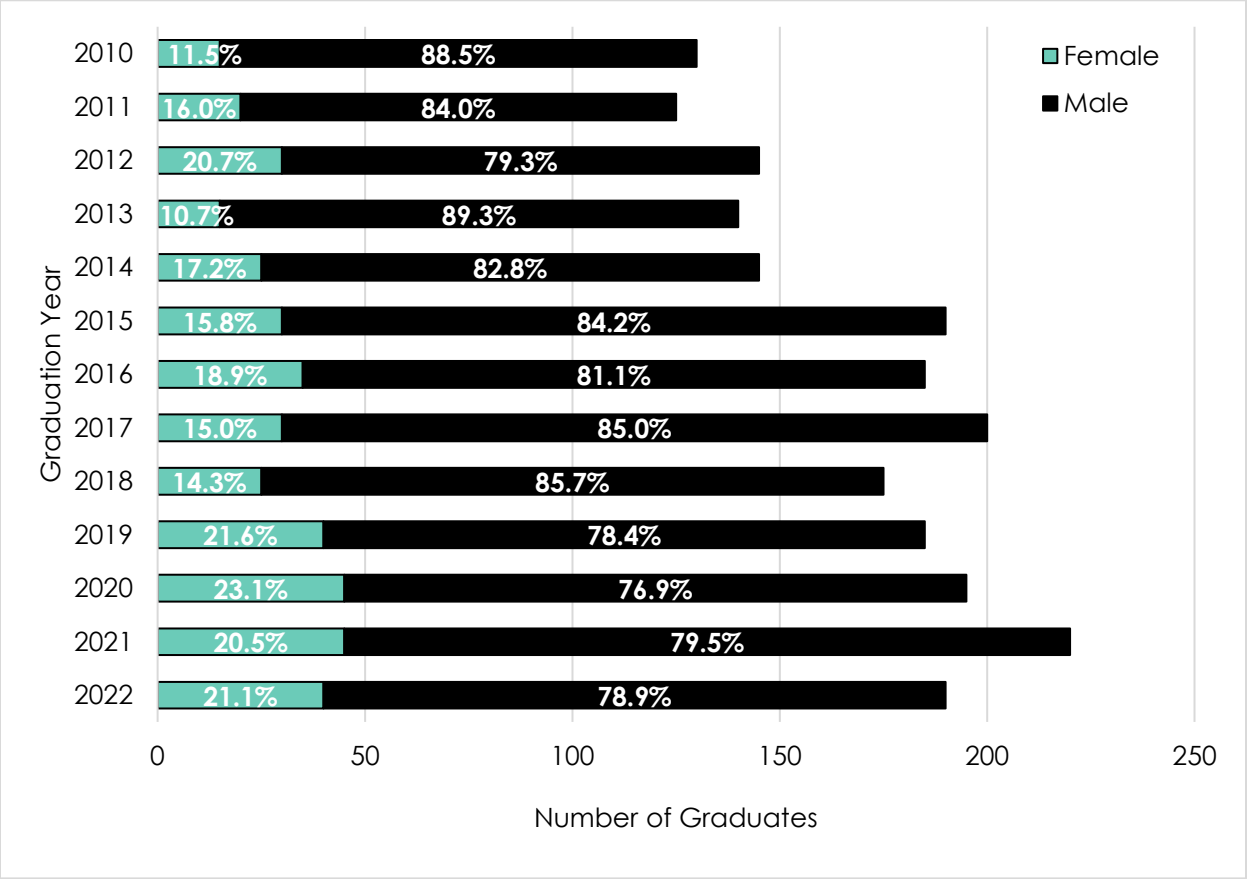


Figure 4: Number of College ICT Graduates by Gender

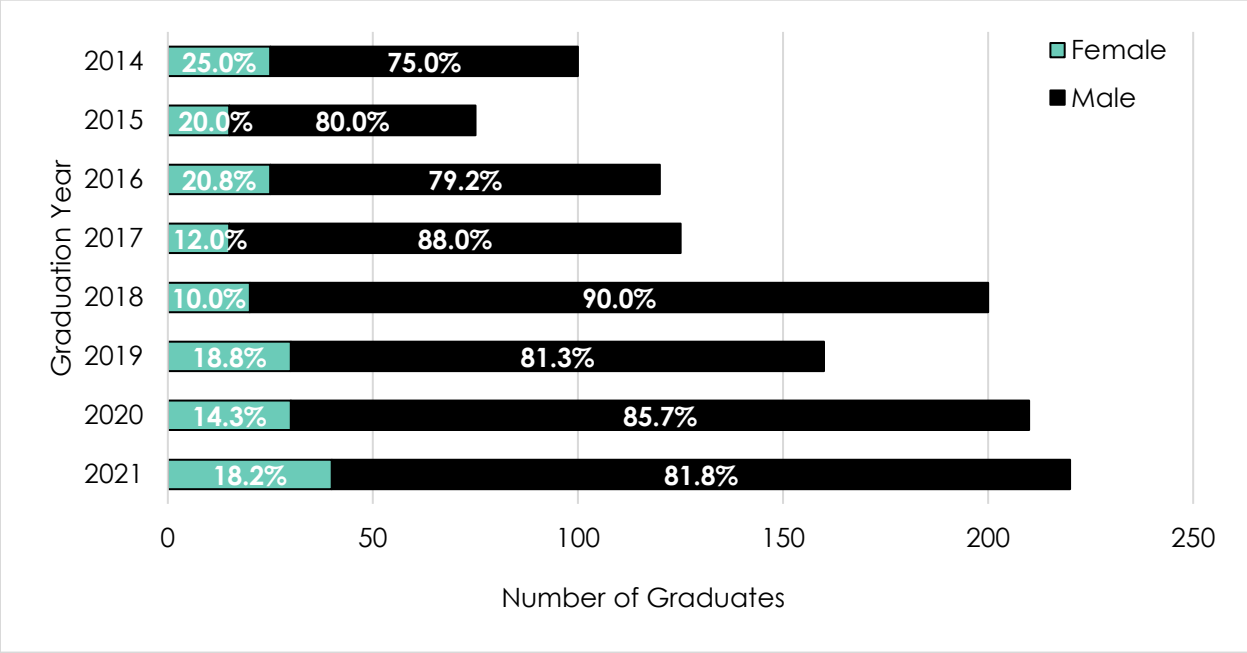
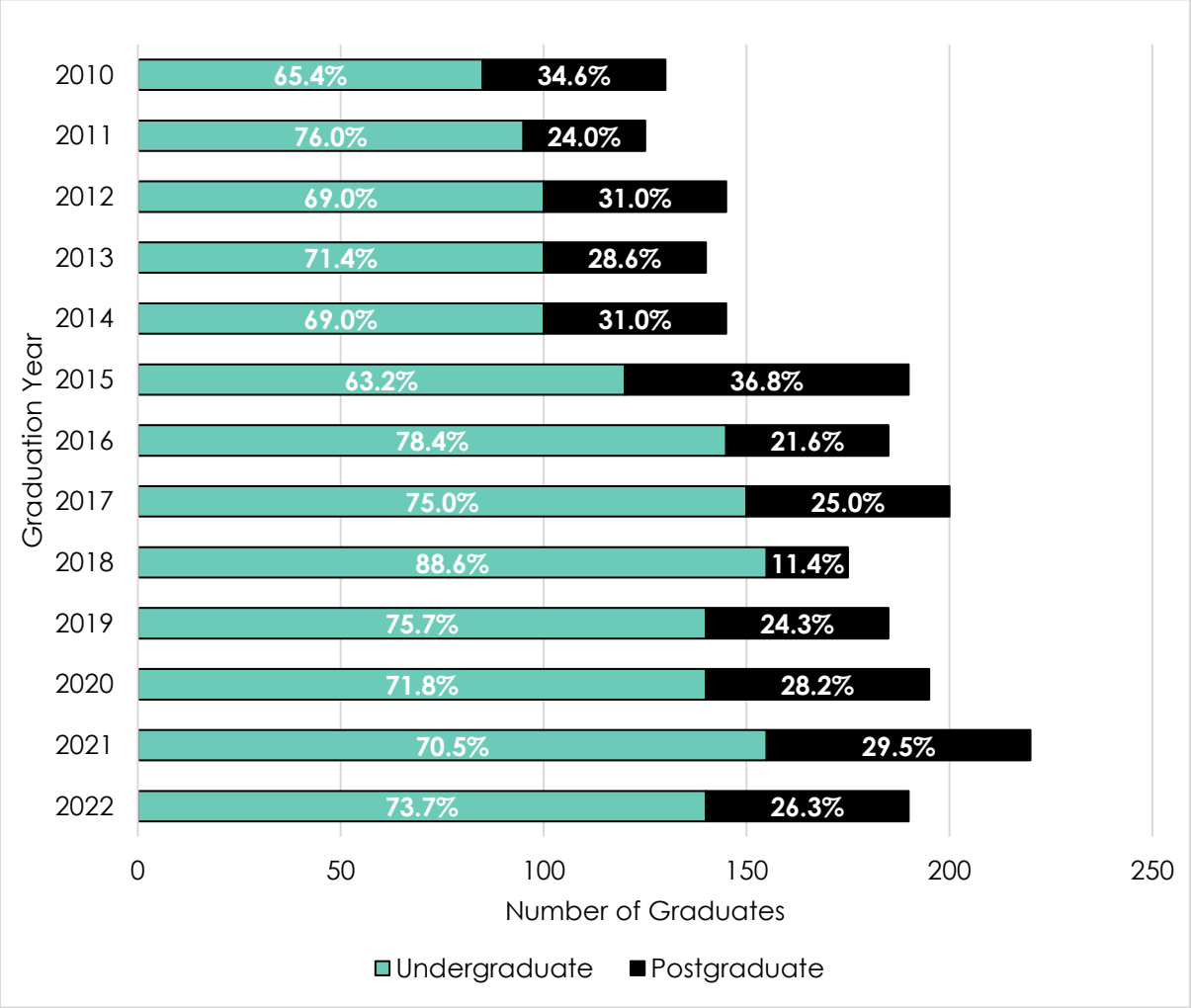


Figure 5 disaggregate university ICT graduates, focusing on the share of each cohort that graduated with undergraduate vs. postgraduate credentials.

Figure 5: Number of University ICT Graduates by Education Level



On average, undergraduates made up 73% of university ICT graduates, with postgraduates accounting for the remaining 27.0%. The share of postgraduates was relatively higher in the earlier part of the study period, hovering around 31-35% between 2010 and 2015. However, starting in 2016, we see a visible trend toward a larger undergraduate share.

Table 3 presents the number of ICT graduates from the four public post-secondary institutions that offered ICT programs.

UNB consistently had the largest cohorts of ICT graduates throughout the 2010-2022 period, with the number of graduates generally increasing from 95 individuals in 2010 to a peak of 190 in 2021. Meanwhile, NBCC was the second largest source of ICT graduates among NB's post-secondary institutions, demonstrating notable growth in numbers from 75 graduates in 2014 to 165 in 2021.

Table 3: Number of ICT Graduates by NB Institution

Graduation Year	UMoncton	UNB	CCNB	NBCC
2010	30	95	NA	NA
2011	10	110	NA	NA
2012	20	125	NA	NA
2013	25	105	NA	NA
2014	20	120	25	75
2015	20	165	25	50
2016	25	150	55	65
2017	30	165	30	95
2018	25	150	50	150
2019	45	135	35	125
2020	20	170	50	160
2021	25	190	55	165
2022	20	165	NA	NA

Data for CCNB and NBCC are only available from 2014 to 2021.

For additional context, we also consider the share of ICT graduates within each institution, as shown in Table 31 in Appendix A.

On average, 6.3% of UNB graduates were in ICT programs, whereas ICT graduates presented 2.4% of all UMoncton graduates over the same period (2010-2022).

At the college level, the share of students who had studied ICT accounted for 3.5% of CCNB graduates and 5.3% of NBCC graduates. Both colleges saw their ICT shares increase over time – with NBCC's share rising from 3.7% in 2014 to around 7% in later years and CCNB's share increasing from approximately 2% to over 4% by 2021.

In **Figure 6**, we see how university ICT graduates were distributed across ICT programs, with the highest share (58.7%) of graduates being in Computer Science and the second highest share (35.4%) being in Electrical and Electronics Engineering.

Figure 6: Distribution of University ICT Graduates by Program (Pooled Graduation Years: 2010-2022)

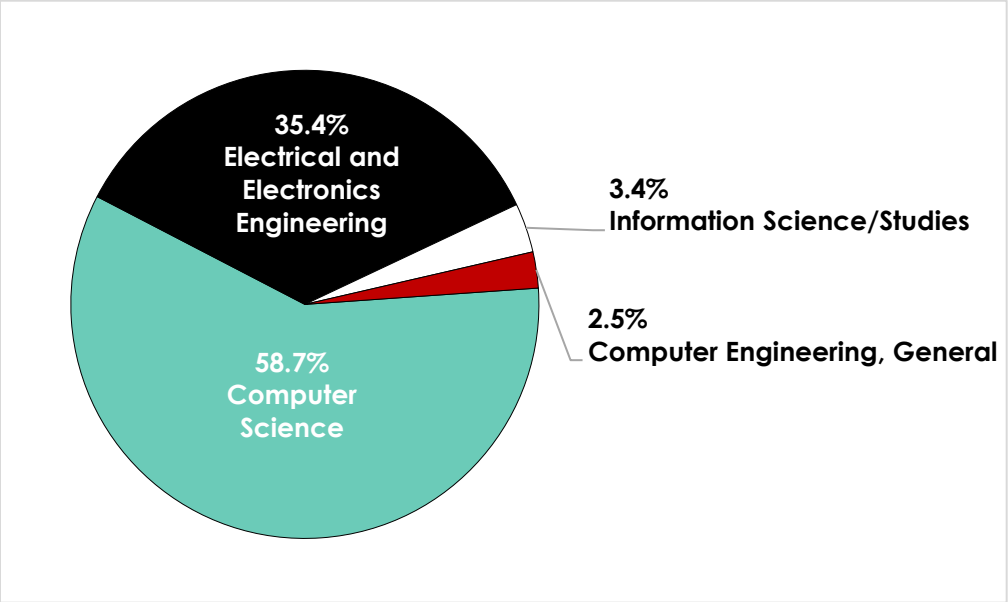


Table 4 similarly presents programs of study for college ICT graduates, with graduates being less concentrated in any one program than their university counterparts.

Table 4: Distribution of College ICT Graduates by Program

Program	N	Share
Network and System Administration	410	35.3%
Electrical, Electronic & Communications Engineering Technology	245	21.1%
Computer Systems Analysis	220	19.0%
Computer Programming/Programmer, General	100	8.6%
Computer and Information Systems Security/Information Assurance	80	6.9%
Animation, Interactive Technology, Video Graphics & Special Effects	75	6.5%
Drafting and Design Technology/Technician, General	30	2.6%

Around one-third (35.3%) of ICT college graduates were in the Network and System Administration program. The second highest share appeared in Electrical, Electronic & Communications Engineering Technology (21.1%), followed by Computer Systems Analysis (19.0%).

Provincial Retention of University and College ICT Graduates

This section presents the provincial retention rates of ICT graduates from public post-secondary institutions in NB – showing how many ICT graduates stayed in the province after graduation.

Table 5: Provincial Retention Rates of University ICT Graduates

Graduation Year	1-Year	3-Year	5-Year	10-Year
2010	65.4%	46.2%	46.2%	42.3%
2011	60.0%	52.0%	44.0%	40.0%
2012	62.1%	51.7%	44.8%	44.8%
2013	46.4%	42.9%	39.3%	35.7%
2014	62.1%	51.7%	48.3%	
2015	65.8%	55.3%	55.3%	
2016	62.2%	48.7%	46.0%	
2017	72.5%	60.0%	57.5%	
2018	77.1%	62.9%	60.0%	
2019	73.0%	62.2%		
2020	79.5%	69.2%		
2021	79.6%			
2022	84.2%			
Overall	**69.7%**	**55.6%**	**49.8%**	**40.7%**

Table 5 shows that university-level ICT graduates had an average 1-year retention rate of about 70%.

While 1-year rates exhibited some volatility in earlier years, an increasing trend can be seen starting in 2017, with recent cohorts (2019-2022) showing rates around 80% and above.

After five years, about half of university ICT graduates still resided in the province, while the average 10-year retention rate was 40.7%.

This implies that many of the university ICT graduates who were retained in the short term may have left the province over the longer period in search of better employment prospects.

Table 6: Retention Rates of College ICT Graduates

Graduation Year	1-Year	3-Year	5-Year
2014	85.0%	80.0%	75.0%
2015	93.3%	93.3%	93.3%
2016	79.2%	75.0%	70.8%
2017	88.0%	84.0%	84.0%
2018	87.5%	85.0%	82.5%
2019	90.6%	84.4%	
2020	90.5%	83.3%	
2021	88.6%		
Overall	**88.0%**	**83.3%**	**80.6%**

Table 6 shows that the average 1-year retention rate for college ICT graduates was 88% – around 18 percentage points higher than 1-year retention among university ICT graduates.

In general, the yearly 1-year retention rates fluctuated near this average, ranging from a low of 79.2% in 2016 to a high of 93.3% in 2015.

Notably, after three and even five years, a majority of college graduates still lived in NB, with average retention rates at 83.3% and 80.6%, respectively – significantly higher than the corresponding university rates. This could be due to the nature of college training, which may be more in line with local and provincial needs and therefore may contribute to higher retention.

Table 7: Retention Rates of University ICT Graduates from NB

Graduation Year	1-Year	3-Year	5-Year	10-Year
2010	85.7%	57.1%	57.1%	57.1%
2011	76.9%	76.9%	61.5%	53.9%
2012	85.7%	71.4%	57.1%	64.3%
2013	60.0%	50.0%	50.0%	50.0%
2014	78.6%	71.4%	64.3%	
2015	94.1%	70.6%	76.5%	
2016	89.5%	68.4%	68.4%	
2017	90.5%	71.4%	66.7%	
2018	85.0%	70.0%	70.0%	
2019	83.3%	61.1%		
2020	85.0%	75.0%		
2021	87.5%			
2022	84.2%			
Overall	**84.8%**	**68.3%**	**64.8%**	**56.9%**

Table 7 breaks down results according to graduates' previous residence, looking at the provincial retention of university ICT graduates originally from NB.

Overall, 84.8% of university ICT graduates from NB were retained in the province one year after graduation from one of NB's public post-secondary institutions. However, the average retention rates fell to 68.3% after three years, decreasing to 64.8% after five years and then dropping to 56.9% (slightly over half of graduates) after ten years.

Table 8 shows that the average 1-year retention of college ICT graduates from NB (87.3%) was slightly higher than the 1-year retention rate for university ICT graduates from NB (84.8%).

However, college graduates from NB did not see the same drop in retention over the longer term, maintaining an average retention rate over 80% both three and five years following graduation.

Table 8: Retention Rates of College ICT Graduates from NB

Graduation Year	1-Year	3-Year	5-Year
2014	84.2%	84.2%	79.0%
2015	92.9%	92.9%	92.9%
2016	77.3%	72.7%	72.7%
2017	87.0%	82.6%	82.6%
2018	86.1%	86.1%	83.3%
2019	92.3%	84.6%	
2020	92.3%	88.5%	
2021	87.0%		
Overall	**87.3%**	**84.3%**	**81.6%**

Table 9 shifts focus to university ICT graduates from outside Canada (international students).

Table 9: Retention Rates of University ICT Graduates from Outside Canada

Graduation Year	1-Year	3-Year	5-Year	10-Year
2010	44.4%	33.3%	33.3%	22.2%
2011	30.0%	20.0%	20.0%	20.0%
2012	40.0%	30.0%	30.0%	30.0%
2013	28.6%	28.6%	21.4%	21.4%
2014	38.5%	30.8%	30.8%	
2015	41.2%	41.2%	35.3%	
2016	33.3%	25.0%	25.0%	
2017	53.3%	46.7%	46.7%	
2018	77.8%	55.6%	55.6%	
2019	75.0%	75.0%		
2020	78.6%	71.4%		
2021	73.3%			
2022	86.7%			
Overall	**54.5%**	**42.2%**	**33.0%**	**23.3%**

On average, over half of international students who graduated from university ICT programs between 2010 and 2022 were retained one year post-graduation. After five years, however, only one-third of these international graduates still resided in the province.

It is important to note that yearly estimates show increasing retention post-2017, which could be partly attributed to increasing matching rates caused by Medicare eligibility for international students.

If this is the case, it would suggest the lower retention rates leaving up to 2017 may be somewhat underestimated due to the lower ability to match data records.

Table 10: Retention Rates of College ICT Graduates from Outside Canada

Graduation Year	1-Year	3-Year	5-Year
2014	100.0%	0.0%	0.0%
2015	100.0%	100.0%	100.0%
2016	100.0%	100.0%	50.0%
2017	100.0%	100.0%	100.0%
2018	100.0%	75.0%	75.0%
2019	83.3%	83.3%	
2020	93.3%	80.0%	
2021	90.5%		
Overall	**92.3%**	**80.6%**	**70.0%**

In **Table 10**, we see that college ICT graduates who came to NB from outside Canada (i.e., international students) had notably higher average 1-year retention rates than their university counterparts (92.3% vs. 54.5%).

It should be noted, though, that counts for these college graduates were small prior to 2018, ranging from 5-10 graduates per year.

Among the larger cohorts observed after 2018 (with 30 ICT graduates and above), 1-year retention rates dropped below 100% but still remained within the 80-90% range.

Finally, in **Table 11**, we consider the provincial retention of university ICT graduates who came to NB from other Canadian provinces (domestic students not from NB).

Table 11: Retention Rates of University ICT Graduates from Other Provinces

Graduation Year	1-Year	3-Year	5-Year	10-Year
2010	33.3%	33.3%	33.3%	33.3%
2011	100.0%	50.0%	50.0%	50.0%
2012	40.0%	40.0%	40.0%	20.0%
2013	75.0%	75.0%	75.0%	50.0%
2014	100.0%	50.0%	50.0%	
2015	50.0%	50.0%	50.0%	
2016	33.3%	33.3%	16.7%	
2017	50.0%	50.0%	50.0%	
2018	50.0%	50.0%	33.3%	
2019	42.9%	42.9%		
2020	60.0%	40.0%		
2021	60.0%			
2022	75.0%			
Overall	**54.4%**	**45.8%**	**41.7%**	**35.7%**

The number of university graduates from other provinces generally ranged from 15 to 25 students per year. Consequently, we see notable volatility in the yearly retention rates.

The average 1-year retention rate for this category of graduates was 54.4%, which dropped to 45.8% and 41.7% after three and five years, respectively.

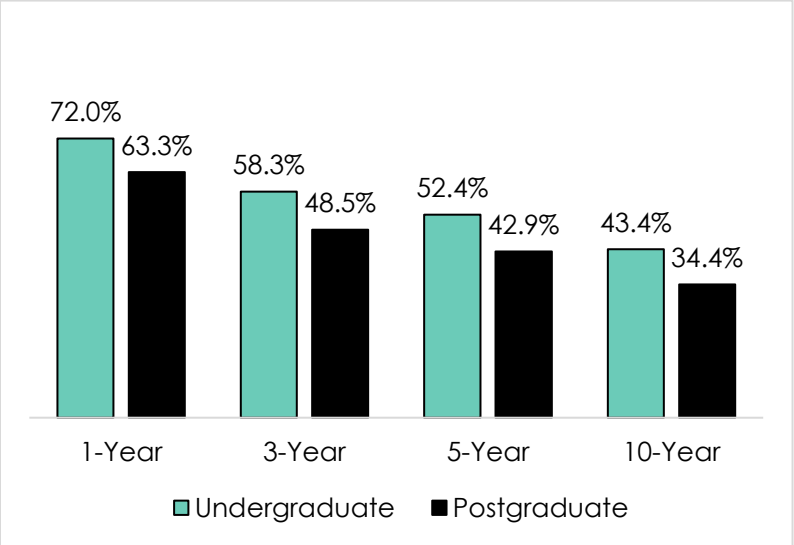
Note: Due to the nearly complete absence of college ICT graduates from other provinces, their results could not be reported.

Figure 7: Retention Rates of University ICT Graduates by Education Level (Pooled Years: 2010-2022)

Figure 7 shows the pooled retention rates of university ICT graduates by education level.

After one year, 72.0% of undergraduates and 63.3% of postgraduates were retained in NB. By 10 years, these rates fell to 43.4% (undergraduates) and 34.4% (postgraduates).

At each interval, the retention rate for undergraduates exceeded that of postgraduates.



Pooled years are as follows: 1-Year rate (2010–2022), 3-Year rate (2010–2020), 5-Year rate (2010–2018), 10-Year rate (2010–2024).

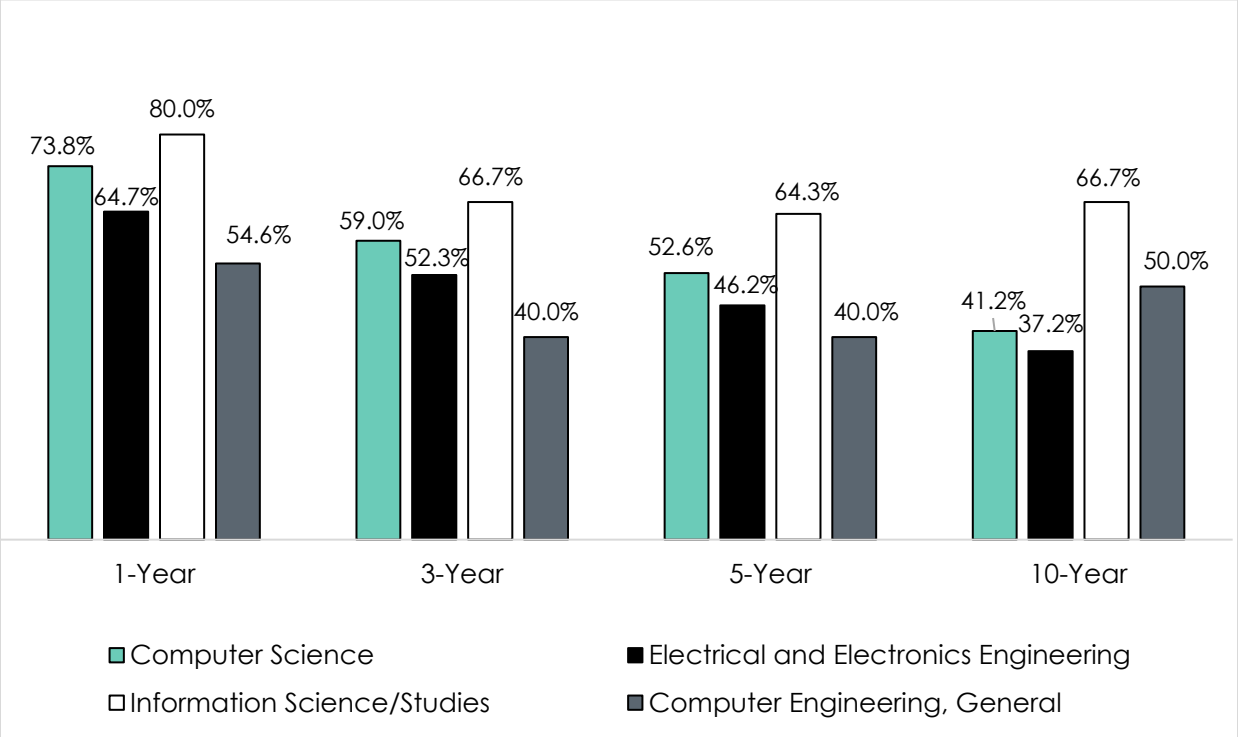
The annual retention rates of university ICT graduates by education level are available in Table 32 in Appendix A.

In **Figure 8** and **Table 12** below, we examine the pooled retention rates of university and college ICT graduates based on their program of study.

Among university ICT graduates, individuals from Information Science/Studies had the highest 1-year retention rate (80.0%) and demonstrated long-term stability, maintaining 66.7% retention after three and even ten years. University graduates from Computer Science exhibited the second highest 1-year retention rate at 73.8%, with their 3-year retention rate falling to 59.0% and continuing a downward trend in the longer term. In general, graduates of Electrical and Electronics Engineering had the lowest rates of the university ICT cohorts.

As a note, it is sometimes the case that retention rates may appear lower at an earlier time interval compared to a later interval, which can be confusing. For example, university graduates of Information Sciences/Studies in Figure 8 had 64.3% retention at the 5-year mark and higher (66.7%) retention at the 10-year mark. This can occur when findings are based on different groups of graduates. For example, in Figure 8, the pooled 5-year retention rate is based on the 2010-2018 cohorts, while the pooled 1-year retention rate reflects the 2010-2024 cohorts.

Figure 8: Pooled Retention Rates (2010-2022) of University ICT Graduates by Program of Study



Note: Pooled analysis years are as follows: 1-Year rate (2010–2022), 3-Year rate (2010–2020), 5-Year rate (2010–2018), and 10-Year rate (2010–2024).

The pooled 1-year retention rates for college ICT graduates in Table 12 were all relatively high – with over 80% of graduates from each program living in NB one year after graduation.

Among the college ICT programs, Computer Systems Analysis demonstrated the highest retention rates across all time intervals, with a long-term (5-year) rate of 88%.

The lowest retentions rates across all time intervals were observed among graduates of the Animation, Interactive Technology, Video Graphics & Special Effects program, with a low of 78.6% retention three years after graduation.

Table 12: Pooled Retention Rates (2014-2021) of College ICT Graduates by Program of Study

Program	1-Year (2014-2021)	3-Year (2014-2020)	5-Year (2014-2018)
Network and System Administration	89.0%	84.9%	82.5%
Electrical, Electronic & Communications Engineering Technology	87.8%	81.6%	79.0%
Computer Systems Analysis	90.9%	91.9%	88.0%
Computer Programming/Programmer, General	90.0%	87.5%	83.3%
Computer and Information Systems Security/Information Assurance	87.5%	90.9%	83.3%
Animation, Interactive Technology, Video Graphics & Special Effects	80.0%	78.6%	80.0%
Drafting and Design Technology/Technician, General	83.3%	83.3%	66.7%

Note: Pooled analysis years are as follows: 1-Year rate (2010–2021), 3-Year rate (2010–2020), and 5-Year rate (2010–2018)

Table 33 in Appendix A presents the annual retention rates of university ICT graduates for the two largest programs of study, and Table 34 includes the annual retention rates of college ICT graduates for the three largest programs of study.

Overall, short- and long-term retention in New Brunswick was significantly higher among college ICT graduates than their university counterparts. This was the case among graduates who were originally from NB as well as graduates from outside Canada (international students).

Permanent Residents with ICT Skills: A Descriptive Profile

This section provides an overview of the characteristics of permanent residents (PRs) with ICT skills who had listed NB as their intended destination on their PR applications. The analysis focuses on primary applicants and describes their characteristics across several dimensions, including immigration stream, gender, official language, country of origin (citizenship), Census Metropolitan Area (CMA) at landing, and National Occupational Classification (NOC) codes as declared in their applications.

Table 13 shows the number of primary applicants with ICT skills who landed in NB between 2005 and 2023. Due to small counts, data from earlier years are pooled together.

Table 13: Number and Matching Rate of Primary Applicants with ICT Skills

Landing Year	Total	Matched	Matching Rate
2005-2009	145	130	89.7%
2010-2014	185	185	100.0%
2015	35	30	85.7%
2016	110	95	86.4%
2017	265	240	90.6%
2018	300	260	86.7%
2019	380	325	85.5%
2020	150	120	80.0%
2021	245	220	89.8%
2022	350	310	88.6%
2023	405	355	87.7%
Total	**2570**	**2270**	**88.3%**

As a reminder, matched primary applicants are primary applicants whose records could be matched (linked) across both the Permanent Resident Data (IRCC Landing File) and the Citizen Data.

The matching rate indicates the percentage of primary applicants that arrived in the province after becoming a permanent resident, as measured by registration in the provincial Medicare system.

Although there was some volatility in the number of arrivals with ICT skills – primarily during the COVID-19 pandemic period in 2020-202 – a pattern of steady increases can be observed.

On average, the matching rate for primary applicants with ICT skills was 88.3%, and rates generally remained close to this average throughout the study period. This indicates that most permanent residents with ICT skills who intended to settle in NB did in fact arrive in the province and stay long enough to register for provincial health insurance.

Table 35 in Appendix A summarizes how many permanent residents arriving in NB were ICT-skilled primary applicants, expressed as a proportion of total landings.

Over the full 2005-2023 period, ICT primary applicants represented 8.1% of all PR landings in NB. However, this only reflects the period average. Broken down by year, the proportion of PR landings accounted for by ICT primary applicants grew substantially for a period of time. While this group represented less than 7% of all landings through 2016, the ICT share surged to 17.3% in 2017 and then stabilized around 12-15% through 2020. It declined to around 7-8% in 2021-2023.

In **Table 14**, we break down the distribution of primary applicants with ICT skills according to the immigration pathways through which they landed in NB.

Table 14: Distribution of Primary Applicants with ICT Skills by Immigration Stream

Landing Year	Provincial (NB) Streams		Federal Streams		
	Provincial Nominee Program	AIP	Federal Skilled Worker	Canadian Experience	TR to PR
2005-2009	56.7%	NA	43.3%	0.0%	NA
2010-2014	59.5%	NA	18.9%	21.6%	NA
2015	57.1%	NA	14.3%	28.6%	NA
2016	85.7%	NA	4.8%	9.5%	NA
2017	77.4%	1.9%	1.9%	18.9%	NA
2018	68.9%	6.6%	4.9%	19.7%	NA
2019	76.0%	8.0%	2.7%	13.3%	NA
2020	60.0%	10.0%	6.7%	23.3%	NA
2021	28.6%	24.5%	2.0%	36.7%	8.2%
2022	66.2%	8.5%	7.0%	7.0%	11.3%
2023	65.9%	8.5%	7.3%	14.6%	3.7%
Overall	**64.7%**	**7.6%**	**8.1%**	**16.7%**	**2.9%**

***Note:** The **Temporary Resident** (TR) **to Permanent Resident** (PR) **Pathway only operated during 2021, but those who applied before it ended had their applications processed and their work permits extended until December 2024**.*

For primary applicants with ICT skills, the Provincial Nominee Program (PNP) was the most common immigration stream, accounting for almost two-thirds (64.7%) of landings between 2005 and 2023. With the exception of 2021, the PNP remained the dominant stream across all years.

On average, the Canadian Experience Class was the second most common stream during the 2005-2023 period, representing 16.7% of ICT PR landings. The Atlantic Immigration Program (AIP), which was first introduced in 2017, accounted for 7.6% on average, while 8.1% of ICT-skilled permanent residents arrived through the Federal Skilled Worker program.

Table 36 (Appendix A) shows the share of ICT primary applicants in each immigration stream, measured against the total number of primary applicants who arrived through each pathway. As a reminder, the results presented are only for those who indicated NB as their intended destination.

The Canadian Experience Class had the highest concentration of ICT primary applicants, accounting for 27.9% of all primary applicants in this stream. The share of ICT primary applicants in the Provincial Nominee Program (PNP) and Federal Skilled Worker streams averaged 11-13%, though the PNP saw this share surge to over 20% between 2017 and 2020. On average, the ICT shares for the AIP and TR to PR streams were around 5%.

In **Figure 9**, we see that the significant majority of primary applicants with ICT skills were male – representing an average of 77.6% of 2005-2023 arrivals (compared to 22.4% for females). While this is similar to the gender distribution among ICT graduates, the gap in male and female representation is smaller among the permanent residents.

There has been a notable shift over time, as the proportion of female PRs was relatively higher in the most recent period (2019-2023), consistently representing approximately one-fourth of permanent residents with ICT skills, compared to lower shares in the preceding years.

Figure 9: Number and Distribution of Primary Applicants with ICT Skills by Gender

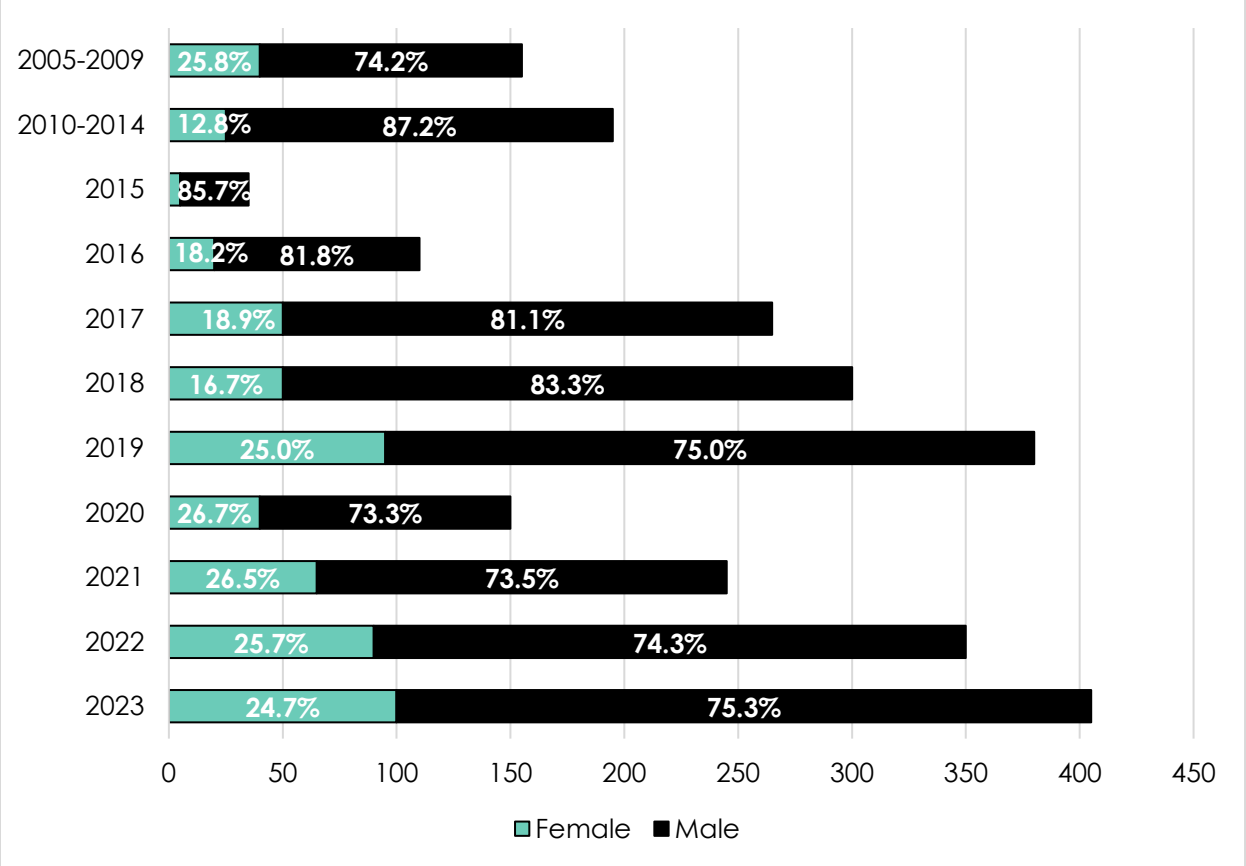
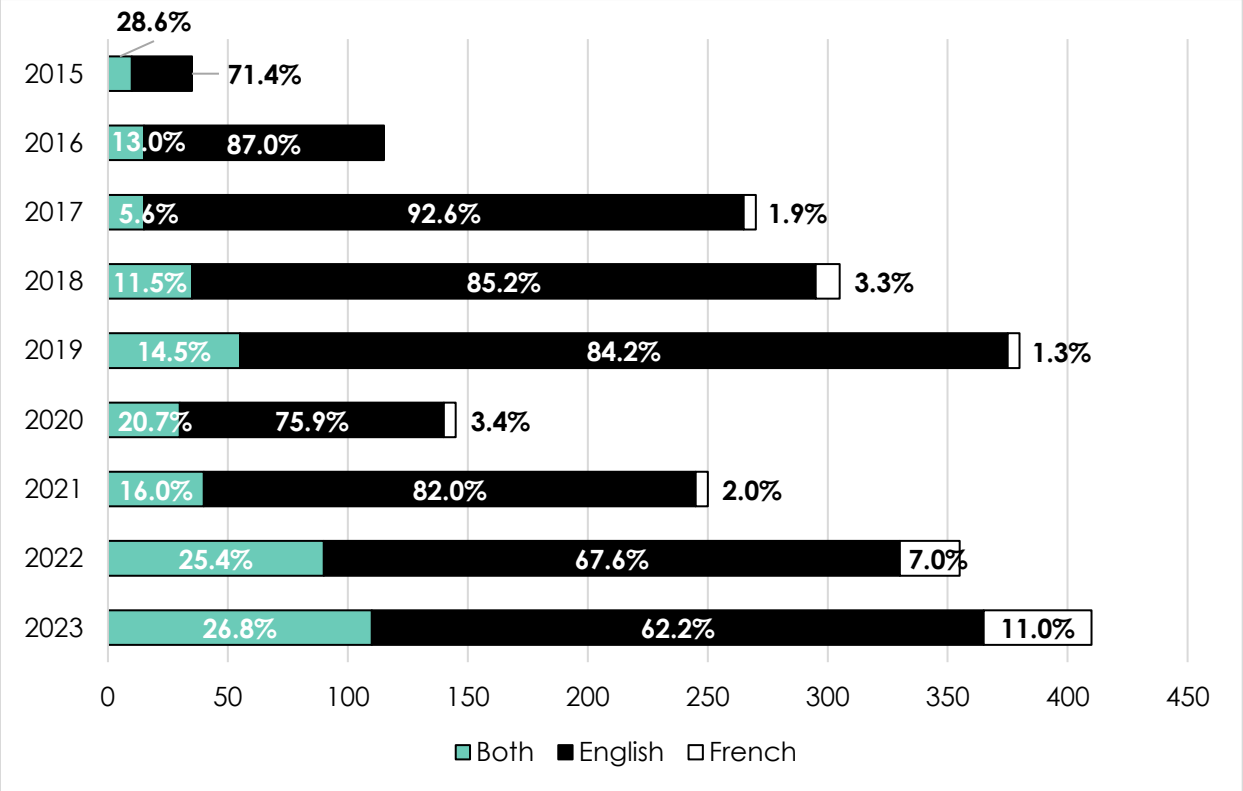


Figure 10 presents a linguistic breakdown of primary applicants with ICT skills based on their ability to speak the official languages in NB (English, French, or both).

> *As a note, the "English" and "French" categories refer exclusively to applicants who reported speaking only one of NB's two official languages. Those who reported speaking both English and French are placed in the separate "both" category. These categories are mutually exclusive, so individuals are counted in only one group.*

Figure 10: Number and Distribution of Primary Applicants with ICT Skills by Language



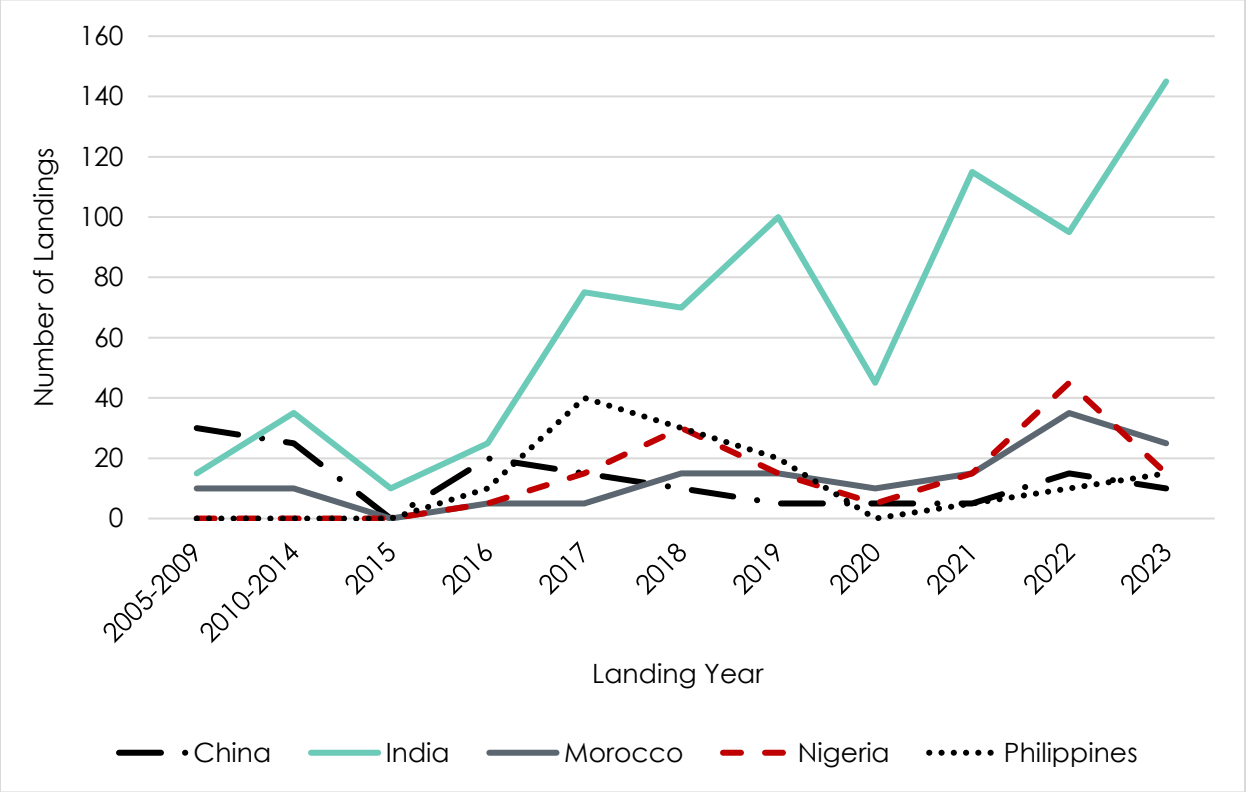
Immigrants who speak English constituted a large majority (78.6% on average) of the primary applicants with ICT skills who landed between 2005 and 2023.

Meanwhile, their counterparts who spoke French made up a very small share, representing only 3.9% of ICT primary applicants overall, and were essentially negligible prior to 2017. However, there has been a clear and substantial increase in the proportion of French-speaking ICT arrivals in recent years, and they made up around 7% and 11% of landed applicants in 2022 and 2023, respectively.

Concurrently, the share of immigrants proficient in both official languages also grew notably, increasing from approximately 15% of the ICT landing cohorts in earlier years to over 25% of the 2022 and 2023 cohorts.

Figure 11 displays the number of permanent residents with ICT skills based on their country of citizenship on arrival for countries with at least 100 cumulative landings in the 2005-2023 period.

Figure 11: Number of Primary Applicants with ICT Skills by Country of Citizenship (>100 Landings)



India was the largest and most consistent source country through the entire period, with a significant and accelerating volume of landings, particularly from 2017 onward. While China had the highest counts in the earliest period (2005-2009), it numbers declined sharply and remained low thereafter.

Morocco showed steady growth in its number of ICT permanent residents in recent years, with the country's yearly landings of 5-10 PRs in earlier periods rising to 30-35 landings near the end of the study period. It is likely that this increase in landings from Morocco contributed to the higher share of Francophone landings shown in Figure 10.

In **Table 15** below, we show both the number and share of permanent residents with ICT skills according to the occupational category indicated on their PR applications.

Table 15: Distribution of Permanent Residents with ICT Skills by NOC Codes (Pooled Landing Years: 2005-2023)

Program	N	Share
Computer Network Technicians	245	9.5%
Computer Programmers and Interactive Media Developers	495	19.2%
Database Analysts and Data Administrators	130	5.0%
Information Systems Analysts and Consultants	595	23.1%
Information Systems Testing Technicians	85	3.3%
Software Engineers and Designers	395	15.3%
User Support Technicians	550	21.3%
Web Designers and Developers	85	3.3%

From 2005 to 2023, permanent residents with ICT skills were concentrated in three occupations, which together account for nearly two-thirds of ICT-skilled PR landings.

Information Systems Analysts and Consultants accounted for 23.1% of permanent residents with ICT skills, followed by User Support Technicians (21.3%) and Computer Programmers and Interactive Media Developers (19.2%).

Figure 12 on the following page exhibits the regional distribution of permanent residents with ICT skills in NB, according to Census Metropolitan Area (CMA) and Census Agglomeration (CA).[6]

It should be noted that individuals' CMA/CA locations are based on their first addresses registered in the Citizen Data and not the intended CMA/CA listed on their permanent resident applications. This is because an individual could end up settling in a different area of NB than originally anticipated at the time of their application, whereas one's Medicare address would reflect where they actually moved.

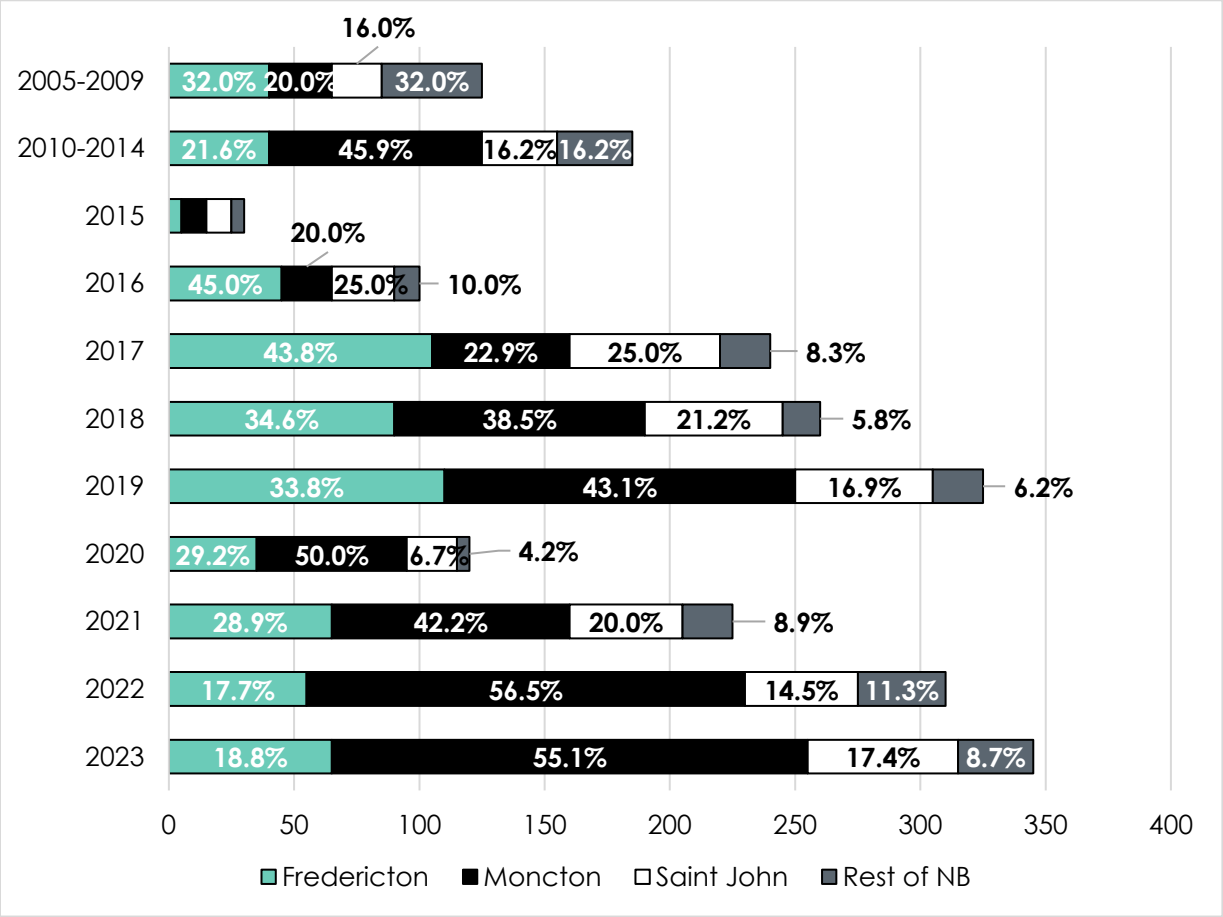
Moncton was the primary destination for permanent residents with ICT skills, attracting an average of 42.2% of ICT-skilled arrivals. Fredericton was the second most common destination at 28.9%, followed by Saint John at 18.8%, with the rest of the province receiving the remaining 10.2%.

The yearly trends in Figure 12 reveal that, from 2018 onward, Moncton's share of permanent residents increased dramatically and consistently, rising to become the dominant destination by a wide margin. In the most recent years, over 50% of matched ICT immigrants settled in the Moncton CMA.

This pattern is similar to that for the destination of all immigrants arriving in NB observed in previous DataNB research, in which Moncton received the highest share of immigrants overall (averaging 36.2% from 2005 to 2023), with its share increasing from 2018 onward and reaching over 45% in the most recent years (Jones et al., 2026a).

[6] A CMA has a total population of at least 100,000, of which at least 50,000 or more live in the core. A CA has a core population of at least 10,000.

Figure 12: Number of Matched Primary Applicants with ICT Skills by CMA



Retention of Permanent Residents with ICT Skills

Having outlined the demographic, occupational, and geographic characteristics of permanent residents with ICT skills who landed in NB, we now turn to an equally important question: whether these individuals remained after their arrival. Retention is a critical component of the ICT labour force, shaping the availability of skilled workers in the province.

In this section, we present the short- and long-term provincial retention rates of permanent residents with ICT skills based on their immigration stream, previous country of citizenship, and ICT-related occupation.

> *It is important to note that the ICT classifications used in this report are derived from the NOC codes declared on immigrants' permanent residency applications before landing. It is not necessarily the case that these immigrants gain employment in an ICT occupation after their arrival.*

Table 16 shows that more than two-thirds (68.7%) of permanent residents with ICT skills still lived in NB one year after landing, though the two most recent cohorts (2022 and 2023) exhibited notably higher retention, at approximately 75%.

After three years, the overall retention rate dropped to 52.1%, falling to 47.5% and 37.9% five and ten years after landing, respectively.

Table 16: Retention Rates of Primary Applicants with ICT Skills

Landing Year	1-Year	3-Year	5-Year	10-Year
2005-2009	69.0%	51.7%	37.9%	27.6%
2010-2014	83.8%	64.9%	59.5%	45.9%
2015	42.9%	42.9%	28.6%	
2016	63.6%	45.5%	45.5%	
2017	64.2%	50.9%	45.3%	
2018	66.7%	55.0%	50.0%	
2019	67.1%	52.6%	47.4%	
2020	56.7%	46.7%		
2021	61.2%	46.9%		
2022	74.3%			
2023	75.3%			
Overall	**68.7%**	**52.1%**	**47.5%**	**37.9%**

To contextualize these retention rates, we also provide the retention rates of permanent residents in non-ICT occupations in NB – presented in Table 37 in Appendix A.

In general, permanent residents with ICT skills exhibited consistently lower retention than permanent residents from other occupations. This was the case at every time interval.

This gap was most pronounced in the short-term period. For example, after one year, 86.9% of permanent residents with a background in Health and 85.0% of permanent residents with a background in Manufacturing and Utilities remained in NB. Their retention rates were over 15 percentage points higher than those of permanent residents with an ICT background.

Ten years after landing, the retention rate for permanent residents with ICT skills (37.9%) was markedly lower than for permanent residents in sectors like Natural Resources (75.0%) and Health (67.8%). This indicates that immigrants in ICT fields may be less likely to stay in the province – both immediately and over the long term – compared to immigrants in most other occupations.

Tables 17, 18, and 19 break down the 1-year, 3-year, and 5-year retention rates of permanent residents with ICT skills based on economic class immigration streams – followed by a presentation of 10-year retention rates in Figure 13.

Table 17: 1-Year Retention Rates of ICT-Skilled Primary Applicants by Immigration Stream

Landing Year	Provincial (NB) Streams		Federal Streams		
	Provincial Nominee Program	AIP	Federal Skilled Worker	Canadian Experience Class	TR to PR Pathway
2005-2009	82.4%	NA	46.2%	NA	NA
2010-2014	90.9%	NA	57.1%	87.5%	NA
2015	25.0%	NA	100.0%	50.0%	NA
2016	66.7%	NA	100.0%	50.0%	NA
2017	68.3%	100.0%	0.0%	40.0%	NA
2018	73.8%	50.0%	33.3%	50.0%	NA
2019	68.4%	66.7%	50.0%	60.0%	NA
2020	61.1%	33.3%	50.0%	28.6%	NA
2021	64.3%	58.3%	100.0%	61.1%	50.0%
2022	85.1%	66.7%	20.0%	60.0%	50.0%
2023	77.8%	71.4%	50.0%	75.0%	66.7%
Overall	**74.0%**	**61.5%**	**47.6%**	**58.1%**	**53.3%**

Permanent residents with ICT skills who arrived through the Provincial Nominee Program had the highest average 1-year retention rate (74.0%) among all economic class immigration streams – a pattern that also held at the 3-year and 5-year marks.

Those from the Atlantic Immigration Program (AIP) exhibited the second highest 1-year retention rate at 61.5%, followed by the Canadian Experience Class at 58.1%.

Three years after landing (Table 18 below), permanent residents form the Provincial Nominee Program continued to have the highest average retention rate, at 56.7%, though with notable yearly volatility. Though the TR to PR Pathway technically had the second highest rate (50%), this was based on only one year of data and a very small sample size.

Of the other pathways, the Canadian Experience Class had the next highest average 3-year retention rate (43.5%) followed closely by the AIP (42.3%). While the Canadian Experience Class and Federal Skilled Worker programs showed similar overall averages (43.5% and 41.9%, respectively), both exhibited extreme yearly fluctuations, with annual rates ranging from 0% to 100% due to very small cohort sizes.

Table 18: 3-Year Retention Rates of ICT-Skilled Primary Applicants by Immigration Stream

Landing Year	Provincial (NB) Streams		Federal Streams		
	Provincial Nominee	AIP	Federal Skilled Worker	Canadian Experience	TR to PR
2005-2009	64.7%	NA	30.8%	NA	NA
2010-2014	68.2%	NA	42.9%	62.5%	NA
2015	25.0%	NA	100.0%	50.0%	NA
2016	50.0%	NA	100.0%	50.0%	NA
2017	53.7%	0.0%	0.0%	40.0%	NA
2018	59.5%	50.0%	33.3%	41.7%	NA
2019	54.4%	50.0%	50.0%	50.0%	NA
2020	50.0%	33.3%	50.0%	28.6%	NA
2021	64.3%	41.7%	100.0%	38.9%	50.0%
Overall	**56.7%**	**42.3%**	**41.9%**	**43.5%**	**50.0%**

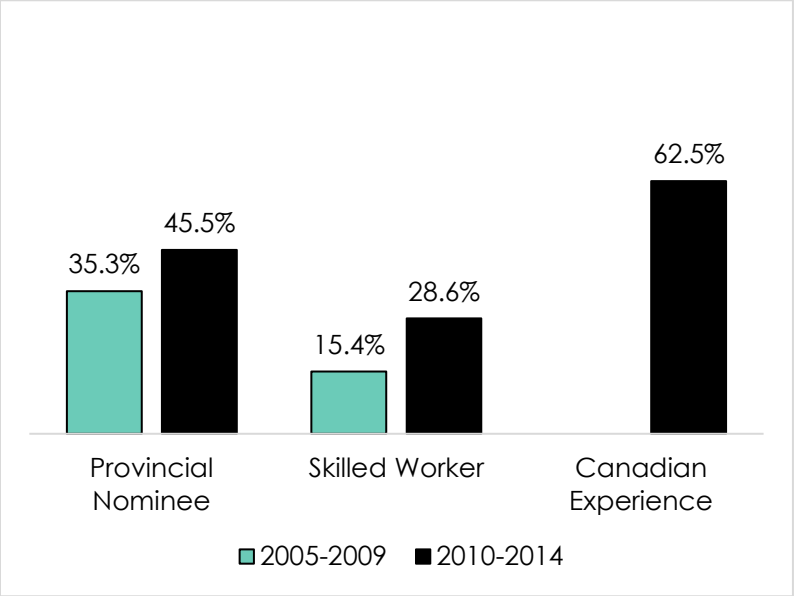
Observing retention five years after landing (Table 19), we see a similar pattern in retention across immigration streams. The Provincial Nominee Program still had the highest average 5-year retention, with just under half (48.8%) of its permanent residents remaining in NB.

The second highest average 5-year retention rate was among permanent residents in the Canadian Experience Class (45.5%) and then the AIP (36.4%). The Federal Skilled Worker program had the lowest average retention over five years at 25.0%, with rates varying dramatically from 0% to 100% due to small annual cohorts.

Table 19: 5-Year Retention Rates of ICT-Skilled Primary Applicants by Immigration Stream

Landing Year	Provincial (NB) Streams		Federal Streams	
	Provincial Nominee	AIP	Federal Skilled Worker	Canadian Experience
2005-2009	47.1%	NA	15.4%	NA
2010-2014	54.5%	NA	42.9%	75.0%
2015	25.0%	NA	0.0%	0.0%
2016	44.4%	NA	100.0%	50.0%
2017	48.8%	0.0%	0.0%	30.0%
2018	54.8%	50.0%	0.0%	41.7%
2019	45.6%	33.3%	50.0%	50.0%
Overall	**48.8%**	**36.4%**	**25.0%**	**45.5%**

Figure 13: 10-Year Retention Rates of ICT-Skilled Primary Applicants by Immigration Stream



Finally, in **Figure 13**, we see the 10-year retention rates of ICT-skilled permanent residents by immigration stream, with the Canadian Experience Class showing the highest long-term retention (62.5%).

About 41% of immigrants from the Provincial Nominee Program still lived in NB ten years after landing, followed by one-fifth (20.0%) of those who came through Federal Skilled Worker program.

Tables 20, 21, and 22 across the following pages similarly present the short- and long-term retention rates of NB's ICT-skilled permanent residents, disaggregating results according to their country of citizenship. These are followed by Figure 14, which presents 10-year results.

Table 20: 1-Year Retention Rates of ICT-Skilled Primary Applicants by Country of Citizenship

Landing Year	China	India	Morocco	Nigeria	Philippines
2005-2009	62.5%	40.0%	100.0%	NA	NA
2010-2014	100.0%	75.0%	100.0%	NA	NA
2015	NA	50.0%	NA	NA	NA
2016	60.0%	50.0%	100.0%	100.0%	100.0%
2017	75.0%	47.1%	0.0%	100.0%	87.5%
2018	25.0%	62.5%	66.7%	83.3%	83.3%
2019	0.0%	70.8%	50.0%	100.0%	100.0%
2020	100.0%	50.0%	33.3%	100.0%	NA
2021	100.0%	53.8%	66.7%	100.0%	100.0%
2022	66.7%	71.4%	71.4%	100.0%	100.0%
2023	50.0%	77.4%	57.1%	100.0%	100.0%
Overall	**64.7%**	**63.1%**	**63.6%**	**96.6%**	**92.3%**

The highest average 1-year retention rates in Table 20 belonged to source countries with relatively small numbers of ICT-skilled immigrants: Nigeria (96.6%) and the Philippines (92.3%). These countries exhibited consistently high retention over the years, a finding that aligns with other studies DataNB has conducted on immigrants from these countries (Jones et al., 2026a).

Despite being the largest source country of ICT permanent residents in NB, India exhibited the lowest average 1-year retention rate, at 63.1%. However, its two most recent cohorts showed notably higher rates, exceeding 70%.

Observing the 3-year retention rates in Table 21, we see that permanent residents from Nigeria and the Philippines continued to exhibit the highest retention rates – at 88.2% and 76.2%, respectively. In contrast, India and China had the lowest and most similar average rates (44.8% each). China's rate declined sharply to 0% in recent years, though this is likely a reflection of the very small number of applicants who landed each year.

Table 21: 3-Year Retention Rates of ICT-Skilled Primary Applicants by Country of Citizenship

Landing Year	China	India	Morocco	Nigeria	Philippines
2005-2009	50.0%	40.0%	50.0%	NA	NA
2010-2014	80.0%	50.0%	100.0%	NA	NA
2015	NA	0.0%	NA	NA	NA
2016	40.0%	33.3%	100.0%	100.0%	100.0%
2017	50.0%	35.3%	0.0%	100.0%	75.0%
2018	25.0%	56.3%	33.3%	83.3%	66.7%
2019	0.0%	62.5%	25.0%	66.7%	75.0%
2020	0.0%	41.7%	33.3%	100.0%	NA
2021	0.0%	34.6%	66.7%	100.0%	100.0%
Overall	**44.8%**	**44.8%**	**47.4%**	**88.2%**	**76.2%**

Table 22 below shows a similar pattern in the longer term, with both Nigeria and Philippines maintaining relatively higher 5-year retention rates compared to the other source countries of NB's ICT-skilled permanent residents.

Overall, around two-thirds of ICT immigrants from Nigeria (69.2%) and the Philippines (65%) were still residing in the province five years after landing.

Table 22: 5-Year Retention Rates of ICT-Skilled Primary Applicants by Country of Citizenship

Landing Year	China	India	Morocco	Nigeria	Philippines
2005-2009	37.5%	20.0%	50.0%	NA	NA
2010-2014	60.0%	37.5%	100.0%	NA	NA
2015	NA	0.0%	NA	NA	NA
2016	40.0%	33.3%	0.0%	0.0%	100.0%
2017	50.0%	35.3%	0.0%	66.7%	62.5%
2018	0.0%	50.0%	33.3%	83.3%	66.7%
2019	0.0%	54.2%	25.0%	66.7%	50.0%
Overall	**37.0%**	**42.3%**	**38.5%**	**69.2%**	**65.0%**

Figure 14: 10-Year Retention Rates of ICT-Skilled Primary Applicants by Country of Citizenship

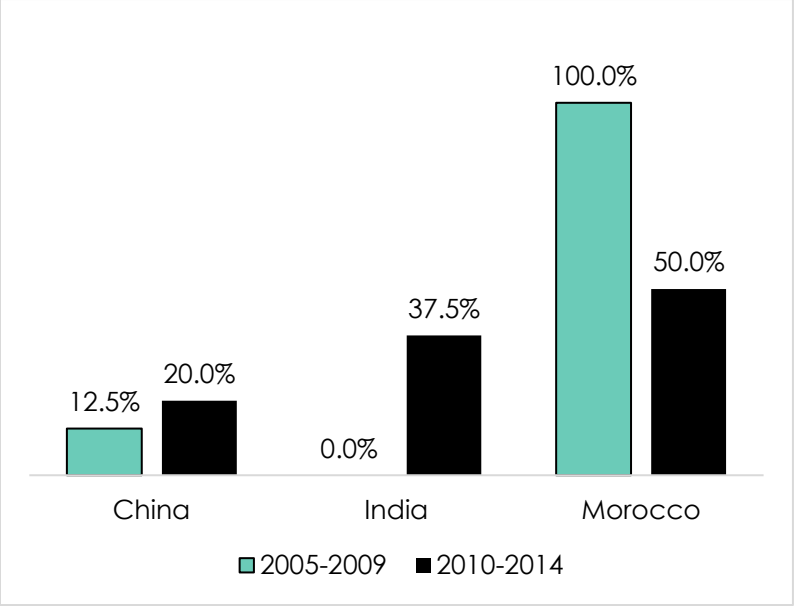


Figure 14 presents the 10-year retention rates of ICT-skilled PRs in NB according to source country, but results should be interpreted cautiously. There were no landings from either Nigeria or the Philippines prior to 2016, and the other countries shown consist of small counts.

Average 10-year retention rates were highest for ICT immigrants from Morocco (75.0%), followed by India (23.1%) and China (15.4%).

Over the following pages, **Tables 23, 24, 25 and 26** dive further into the short- and long-term retention of permanent residents with ICT skills who landed in NB – comparing their retention rates across occupational categories.

Table 23: 1-Year Retention Rates of ICT-Skilled Primary Applicants by Occupation (NOC Codes)

Landing Year	Computer network technicians	Computer programmers and interactive media developers	Database analysts and data administrators	Information systems analysts and consultants	Software engineers and designers	User support technicians
2005-2009	100.0%	66.7%	NA	37.5%	62.5%	66.7%
2010-2014	100.0%	92.3%	NA	75.0%	85.7%	50.0%
2015	100.0%	33.3%	NA	100.0%	100.0%	0.0%
2016	66.7%	75.0%	50.0%	75.0%	66.7%	75.0%
2017	66.7%	66.7%	100.0%	54.5%	57.1%	58.3%
2018	66.7%	78.6%	66.7%	77.8%	57.1%	55.6%
2019	60.0%	58.3%	66.7%	71.4%	61.5%	58.3%
2020	50.0%	75.0%	0.0%	50.0%	60.0%	37.5%
2021	50.0%	71.4%	33.3%	75.0%	66.7%	50.0%
2022	75.0%	77.8%	60.0%	78.6%	75.0%	76.5%
2023	80.0%	70.0%	57.1%	73.3%	81.8%	76.2%
Overall	**73.5%**	**72.2%**	**57.7%**	**69.1%**	**68.8%**	**61.3%**

Among the various ICT-skilled permanent residents in NB, Computer Network Technicians had the highest average 1-year retention, at 73.5%, while User Support Technicians had the lowest at 61.3%. Though Database Analysts and Administrators present even lower retention, this result reflects very small counts and as such is not comparable to the larger categories.

Occupations such as Computer Programmers (72.2%), Information Systems Analysts (69.1%), and Software Engineers (68.8%) had similar averages retention rates. While most occupations demonstrated consistently high retention in recent years, the rates for all groups exhibited significant year-to-year volatility, particularly in earlier periods and among occupations with smaller annual cohorts (such as Database Analysts).

Observing a slightly longer period since landing in Table 24 below, we see that Computer Programmers and Interactive Media Developers had the highest 3-year average retention rate (55.1%), followed by Information Systems Analysts and Consultants (53.2%).

Similar to the 1-year results in Table 23, Database Analysts and Data Administrators (42.9%) and User Support Technicians (42.5%) had the lowest 3-year averages. The retention rates for all occupations showed yearly volatility, with certain cohorts showing 0% retention.

Table 24: 3-Year Retention Rates of ICT-Skilled Primary Applicants by ICT NOC Codes

Landing Year	Computer network technicians	Computer programmers and interactive media developers	Database analysts and data administrators	Information systems analysts and consultants	Software engineers and designers	User support technicians
2005-2009	0.0%	66.7%	NA	37.5%	62.5%	33.3%
2010-2014	50.0%	69.2%	NA	50.0%	57.1%	33.3%
2015	0.0%	33.3%	NA	100.0%	100.0%	0.0%
2016	66.7%	50.0%	50.0%	50.0%	66.7%	50.0%
2017	66.7%	50.0%	50.0%	45.5%	42.9%	50.0%
2018	50.0%	50.0%	66.7%	66.7%	42.9%	55.6%
2019	40.0%	50.0%	33.3%	53.6%	46.2%	50.0%
2020	50.0%	50.0%	0.0%	37.5%	40.0%	37.5%
2021	50.0%	57.1%	33.3%	62.5%	50.0%	33.3%
Overall	**48.4%**	**55.1%**	**42.9%**	**53.2%**	**50.9%**	**42.5%**

Average 5-year retention across all six ICT occupation categories ranged from 41.3% to 50.0% (Table 25), with Database Analysts and Data Administrators having the highest average rate (50.0%) while Software Engineers and Designers had the lowest (41.3%).

Table 25: 5-Year Retention Rates of ICT-Skilled Primary Applicants by ICT NOC Codes

Landing Year	Computer network technicians	Computer programmers and interactive media developers	Database analysts and data administrators	Information systems analysts and Consultants	Software engineers and designers	User support technicians
2005-2009	50.0%	33.3%	NA	25.0%	37.5%	33.3%
2010-2014	50.0%	61.5%	NA	37.5%	57.1%	33.3%
2015	0.0%	0.0%	NA	100.0%	100.0%	0.0%
2016	33.3%	50.0%	50.0%	50.0%	66.7%	50.0%
2017	50.0%	41.7%	50.0%	45.5%	42.9%	41.7%
2018	50.0%	42.9%	66.7%	61.1%	28.6%	55.6%
2019	40.0%	50.0%	33.3%	50.0%	30.8%	41.7%
Overall	**44.4%**	**44.8%**	**50.0%**	**48.7%**	**41.3%**	**42.6%**

Finally, ten years after landing in NB (Table 26), half of Computer Network Technicians were retained in the province – with the highest long-term retention rate among the ICT occupations.

Software Engineers and Designers had the second highest long-term retention, at 46.7%. In contrast, User Support Technicians showed the lowest retention, with an average 10-year retention rate of only 11.1%.

Table 26: 10-Year Retention Rates of ICT-Skilled Primary Applicants by ICT NOC Codes

Landing Year	Computer network technicians	Computer programmers and interactive media developers	Information systems analysts and consultants	Software engineers and designers	User support technicians
2005-2009	50.0%	22.2%	25.0%	37.5%	0.0%
2010-2014	50.0%	46.2%	37.5%	57.1%	16.7%
Overall	**50.0%**	**36.4%**	**31.3%**	**46.7%**	**11.1%**

Statistical Analysis

Retention of ICT Graduates from Post-Secondary Institutions in NB

We conducted a logistic regression to estimate factors influencing the likelihood that an NB ICT graduate would stay in NB at least one year after graduation. We ran two separate models for university and college graduates.

University ICT Graduates

The full results of the regression for university ICT graduates are available in Table 38 (Appendix A), with the findings below summarizing key points.

When other factors are held constant, the analysis for university ICT graduates reveals the following:

- Compared to graduates who were originally from NB, the odds of leaving NB were 7.9 higher for graduates originally from outside Canada (international students) and 9.1 times higher for graduates who came to NB from other provinces.
- UMoncton ICT graduates had 32% lower odds of leaving compared to graduates of UNB.
- Interestingly, postgraduates had 36% lower odds of leaving than undergraduates.

College ICT Graduates

The full results of the regression for college ICT graduates are available in Table 39 (Appendix A). As a summary of key findings, when other factors are held constant, the estimates show the following:

- Female graduates had 1.89 times the odds (or 89% higher odds) of leaving NB compared to male graduates.
- International students had 0.47 times the odds (or 53% lower odds) of leaving compared to graduates from NB (though it should be noted here that results may be impacted by the small counts of international graduates – most of whom were also very recent graduates). This means that their retention in NB cannot be observed past one or two years.
    - Graduates who came to NB from other provinces had 34.86 times the odds of leaving compared to graduates from NB
- Each additional year of age at graduation was associated with a 5.8% increase in the odds of leaving NB one year post-graduation.

Duration of Retention of Permanent Residents with ICT Skills in NB

We also ran a time dependent[7] Cox Proportional Hazard (CoxPH) model to estimate the risk of a permanent resident with ICT skills leaving NB at any given time, while considering multiple factors simultaneously – such as their immigration stream, country of citizenship, and occupation based on NOC codes. A Hazard ratio estimate of greater than 1 implies higher risk of exit, while a ratio lower than 1 signifies lower risk (i.e., longer duration staying in NB).

The full set of results for this model is available in Table 40 (Appendix A), with key findings presented below. Other things being equal:

- Older age at landing was associated with a much lower risk of leaving the province.
- Permanent residents who landed through the TR to PR Pathway had a 124% higher risk of leaving NB than those who arrived through the Provincial Nominee Program (PNP).
    - Meanwhile, those who arrived through the Canadian Experience Class exhibited a 33% greater risk of leaving compared to those in the PNP.
- Immigrants from Nigeria had a 64% lower risk of leaving NB than those from India.
    - In contrast, permanent residents from China had a 41% higher risk of leaving NB compared to those from India.

[7] A time dependent model incorporates covariates that change with time (i.e., tracking certain variables that vary with time for each year of registration).

Discussion of Findings

This study provides an analysis of the trends, dynamics, and factors associated with entry into the Information and Communications Technology (ICT) labour force in New Brunswick (NB). It focuses on the supply of post-secondary graduates from ICT programs in the province, as well as permanent residents with ICT skills, examining patterns in their subsequent retention in the province. The findings underscore key trends and implications for the NB labour market, specifically in relation to the ICT sector.

ICT Graduates from Post-Secondary Institutions in NB

Over the last decade, the number of ICT graduates from universities and colleges in NB has been increasing. Since 2015, the number of university ICT graduates has ranged from 180-200. Meanwhile, the number of college graduates reached a similar level between 2018 and 2021 – nearly doubling earlier outputs.

Individuals who were residents of NB before enrolling in higher education ("NBers") consistently make up the majority of ICT graduates – accounting for half (50.1%) of university ICT graduates and over three-quarters (78.1%) of college university graduates. At each educational level, international students make up a higher share of ICT graduates than students from other provinces – accounting for over one-third (37.1%) of university ICT grads and one fifth (21.5%) of college ICT graduates.

These results only reflect the long-term average, however. At the college level, there have been some significant changes in more recent cohorts – with the share of international students rising from only 5-8% of graduates to nearly half (47.7%) by 2021. This move from a predominantly NB-born cohort to one nearly evenly split between NBers and international graduates is consistent with broader changes in the distribution of college-level graduates (Beykzadeh et al., 2024).

Although the majority of ICT graduates are from NB, this does not mean the majority of graduates from NB studied ICT. To put this into context, only 3-4% of all university and college graduates from NB completed an ICT program. Meanwhile 7-10% of all university and college graduates who came to NB from other countries (i.e., international students) received a credential in ICT. These patterns highlight the increasingly important role of international students in supplying ICT talent in the province. Supplying talent is only one part of the equation, however. Understanding whether these graduates remain in NB is equally important for assessing the province's long-term ICT workforce capacity.

At the university level, approximately 70% of ICT graduates remain in NB one year after their graduation, with retention for more recent cohorts (2019-2022) rising to around 80% or above. On average, about half of the university cohorts remain after five years, with the average 10-year retention rate dropping to around 40%. At the college level, ICT graduates show markedly higher retention. The average 1-year retention rate is 88%, and the majority still reside in NB three (83.3%) and even five years (80.6%) after their graduation.

Based on these patterns, it is likely that a notable portion of the university ICT graduates who leave the province over the longer term are in search of employment opportunities, since university graduates tend to be more geographically mobile than college graduates in general (Bhuiyan et al., 2021). In contrast, the higher retention (and the assumedly stronger provincial attachment) of college graduates may be attributed to college training being more closely aligned with local and provincial labour market needs.

Notably, although university ICT retention is low compared to the college level, the retention of university ICT graduate is higher than that of the "IT university graduates" category examined in previous DataNB research – which found that only about two-thirds of IT graduates remain in NB after one year, with retention rates falling to roughly 40% and 29% at the 5- and 10-year intervals, respectively (Beykzadeh et al., 2025). This comparison is important because it shows that ICT graduates are more likely to stay in the province than graduates from the related set of IT programs. While the reasons for this difference are not fully clear, this finding points to ICT graduates forming a more stable and locally rooted segment of the province's tech workforce, even as IT cohorts show higher mobility.

Permanent Residents with ICT Skills

In addition to graduates from NB's post-secondary institutions, permanent residents with ICT skills represent an important source of ICT talent in NB, and their numbers have generally grown – though with significant volatility during the 2020-21 COVID-19 period. They typically account for 7-8% of all primary applicant landings in NB, though for a period of about five years they represented a much higher percentage (12-17%) of landings in the province.

The average 88.3% matching rate of permanent residents with ICT skills indicates that nearly nine out of ten ICT-skilled primary applicants who apply to land in NB arrive and register for provincial Medicare. This rate is approximately 4 percentage points higher than that of all primary applicants (Jones et al., 2026a), indicating that immigrants with ICT skills who intend to settle in NB are relatively more likely to do so.

While consistent arrivals among permanent residents with ICT skills are encouraging, workforce implications depend heavily on the extent to which these individuals remain in NB. Our results show that, on average, more than two-thirds (68.7%) of PRs with ICT skills remain in NB one year after landing, yet the most recent cohorts (2022–2023) show even higher retention (~75%). Retention declines to 52.1% after three years, with average five- and ten-year rates at 47.5% and 37.9%, respectively.

Moreover, permanent residents with a background in ICT occupations exhibit consistently lower retention at every time interval than immigrants in nearly all other non-ICT occupations. This disparity is most pronounced in the short term, indicating that, compared to immigrants in other occupations, permanent residents with ICT skills have a lower tendency to stay in the province both immediately after landing and over the longer term.

That being said, retention rates by immigration stream show that ICT-skilled permanent residents who arrive through the Provincial Nominee Program have the highest retention rates of all the economic immigration streams – a finding that is consistent with other DataNB studies on immigrant retention in NB (McDonald & Miah, 2024; Jones et al., 2026a). This suggests that certain features in program design and selection criteria may encourage stronger settlement and longer-term integration in NB – though the underlying drivers of this pattern remain unclear.

Viewed together, these findings reveal how different education and immigration pathways shape the overall supply and stability of ICT talent in New Brunswick. Graduates from NB's post-secondary institutions provide a steady and increasingly diverse supply of ICT-skilled workers, with international students playing a growing role and college graduates demonstrating particularly strong long-term retention.

Permanent residents with ICT skills add another important source of talent, though their overall retention is lower than that of other immigrant groups, underscoring the mobility of newcomers possessing ICT skills. Even so, the higher retention observed among those arriving through the Provincial Nominee Program points to the potential of targeted immigration streams to strengthen long-term workforce stability.

Together, these findings highlight both the strengths and the ongoing challenges in NB's ICT labour market, underscoring the importance of complementary research to better understand the factors that shape attraction, integration, and long-term retention.

Further Research

This report is one of a number of reports examining labour supply factors in the ICT sector in New Brunswick. These other reports, which are part of a larger project, include the following:

Labour Supply, Employment, and Earnings in New Brunswick's Information and Communications Technology (ICT) Sector

> This study utilizes data sets in Statistics Canada's Research Data Centre to analyze broader aspects of the ICT labour force in NB. By linking the Postsecondary Student Information System (PSIS) and the Longitudinal Immigration Database (IMDB) with T1 Family File (T1FF) tax data, it further examines trends, dynamics, and factors affecting the ICT labour force in NB, with a focus on understanding growth rates, employment patterns, and the mobility of ICT professionals.

Transition to Permanent Residency and Retention in New Brunswick of Temporary Foreign Workers with Information and Communications Technology (ICT) Skills

This study utilizes a unique linked administrative data set by combining IRCC Permanent Resident and Transition Data, provincial university and college graduation data, and the Citizen Data. It examines permanent resident transition rates among temporary residents with ICT skills – focusing on international graduates and temporary foreign workers in ICT-related fields. It specifically investigates which individuals become permanent residents in the province and how their subsequent retention patterns differ.

Profiling the Demand for Jobs in the Information and Communications Technology (ICT) Sector in New Brunswick

This report analyzes patterns of labour market demand in New Brunswick's Natural and Applied Sciences sector using job postings data aggregated from Vicinity. It examines trends in the volume of postings, advertised wages, and educational requirements between 2019 and 2023, with attention to regional variations across the province. Because of small sample sizes, the analysis focuses primarily on occupations in the 2021 National Occupational Classification "2" category, which includes Natural and Applied Sciences and related occupations – with ICT occupations included within this broader category.

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Appendix A: Supplementary Tables of Results

Table 27: Classification of Instructional Programs (CIP) Codes Related to Information and Communications Technology (ICT)

CIP Codes	Field of Study
Computer and Information Sciences and Support Services	
11.0101	Computer and Information Sciences, General
11.0201	Computer Programming/Programmer, General
11.0301	Data Processing and Data Processing Technology/Technician
11.0401	Information Science/Studies
11.0501	Computer Systems Analysis/Analyst
11.0701	Computer Science
11.0801	Web Page, Digital/Multimedia and Information Resources Design
11.0901	Computer Systems Networking and Telecommunications, General
11.1001	Network and System Administration/Administrator
11.1003	Computer and Information Systems Security/Auditing/Information Assurance
Communications Technologies/Technicians and Support Services	
10.0105	Communications Technology/Technician
10.0201	Photographic and Film/Video Technology/Technician
10.0303	Prepress/Desktop Publishing and Digital Imaging Design
10.0304	Animation, Interactive Technology, Video Graphics and Special Effects
10.0305	Graphic and Printing Equipment Operator, General Production
10.0306	Platemaker/Imager
Engineering/Engineering-Related Technologies/Technicians	
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician
15.0403	Electromechanical/Electromechanical Engineering Technology/Technician
15.1201	Computer Engineering Technology/Technician, General
15.1202	Computer/Computer Systems Technology/Technician
15.1301	Drafting and Design Technology/Technician, General**
Engineering	
14.0901	Computer Engineering, General
14.0902	Computer Hardware Engineering
14.1001	Electrical and Electronics Engineering*

14.1099	Electrical, Electronics and Communications Engineering, Other
Pre-Technology Education/Pre-Industrial Arts Programs[CAN]	
21.0101	Pre-Technology Education/Pre-Industrial Arts Programs[CAN]***

** covers many ICT-related areas; ** when applied to ICT design; *** can be a preparatory step for ICT education and training*

Table 28: National Occupational Classification (NOC 2016) Codes Related to Information and Communication Technology (ICT)

NOC Codes	Occupation
0213	Computer and information systems managers
2171	Information systems analysts and consultants
2172	Database analysts and data administrators
2173	Software engineers and designers
2174	Computer programmers and interactive media developers
2175	Web designers and developers
2281	Computer network technicians
2282	User support technicians
2283	Information systems testing technicians

Table 29: ICT Graduates as a Share of All Post-Secondary Graduates in NB

Graduation Year	University		College	
	Total	ICT Share	Total	ICT Share
2010	4405	3.0%	NA	NA
2011	4390	2.8%	NA	NA
2012	4405	3.3%	NA	NA
2013	4580	3.1%	NA	NA
2014	4365	3.3%	3245	3.1%
2015	4355	4.4%	3025	2.5%
2016	4270	4.3%	3170	3.8%
2017	4145	4.8%	3370	3.7%
2018	3865	4.5%	3460	5.8%
2019	3935	4.7%	3365	4.8%
2020	4040	4.8%	3545	5.9%
2021	4090	5.4%	3735	5.9%
2022	4040	4.7%	NA	NA
Total	**54 885**	**4.1%**	**26 915**	**4.5%**

Table 30: ICT Graduates as a Share of All Post-Secondary Graduates in NB by Previous Residence

Graduation Year	University			College		
	NB	International	Province Outside NB	NB	International	Province Outside NB
2010	2.3%	9.3%	1.7%	NA	NA	NA
2011	2.2%	11.0%	1.1%	NA	NA	NA
2012	2.4%	9.8%	2.6%	NA	NA	NA
2013	1.6%	11.8%	2.1%	NA	NA	NA
2014	2.5%	9.7%	1.1%	3.2%	3.0%	0.0%
2015	3.0%	12.2%	2.3%	2.5%	3.0%	0.0%
2016	3.6%	8.5%	3.3%	3.9%	4.2%	0.0%
2017	4.1%	11.2%	2.2%	3.8%	3.7%	0.0%
2018	4.3%	7.5%	3.2%	6.0%	5.8%	0.0%
2019	3.8%	8.5%	4.0%	4.6%	6.6%	0.0%
2020	4.1%	10.1%	2.8%	4.9%	9.1%	5.9%
2021	4.8%	10.6%	2.8%	4.5%	9.5%	0.0%
2022	4.0%	8.7%	2.4%	NA	NA	NA
Total	**3.2%**	**9.9%**	**2.4%**	**4.2%**	**7.3%**	**0.8%**

Table 31: ICT Graduates as a Share of All Post-Secondary Graduates in NB by Institution

Graduation Year	UMoncton	UNB	MTA*	CCNB	NBCC
2010	2.8%	4.0%		NA	NA
2011	0.9%	4.8%		NA	NA
2012	1.8%	5.5%		NA	NA
2013	2.2%	4.5%		NA	NA
2014	2.0%	5.2%	0.6%*	2.1%	3.7%
2015	1.9%	7.3%		2.3%	2.6%
2016	2.4%	6.7%		4.7%	3.4%
2017	3.0%	7.4%		2.4%	4.7%
2018	2.7%	7.2%	0.6%*	4.3%	7.0%
2019	4.8%	6.3%		3.2%	5.9%
2020	2.2%	7.6%		4.3%	7.1%
2021	2.5%	8.6%		4.6%	6.8%
2022	2.1%	7.4%	1.6%*	NA	NA
Total	**2.4%**	**6.3%**	**0.9%**	**3.5%**	**5.3%**

*Note: *Due to small counts, Mount Allison University (MTA) ICT graduate cohorts are pooled into three periods: 2010-2013, 2014-2018, and 2019-2022.*

Table 32: Annual Retention Rates of University ICT Graduates by Education Level

Graduation Year	Undergraduate				Postgraduate			
	1-Year	3-Year	5-Year	10-Year	1-Year	3-Year	5-Year	10-Year
2010	64.7%	52.9%	52.9%	47.1%	66.7%	33.3%	33.3%	33.3%
2011	63.2%	52.6%	47.4%	42.1%	50.0%	50.0%	33.3%	33.3%
2012	65.0%	55.0%	45.0%	45.0%	55.6%	44.4%	44.4%	44.4%
2013	50.0%	50.0%	45.0%	40.0%	37.5%	25.0%	25.0%	25.0%
2014	65.0%	55.0%	50.0%		55.6%	44.4%	44.4%	
2015	66.7%	54.2%	54.2%		64.3%	57.1%	57.1%	
2016	69.0%	51.7%	51.7%		37.5%	37.5%	25.0%	
2017	73.3%	60.0%	60.0%		70.0%	60.0%	50.0%	
2018	77.4%	61.3%	58.1%		75.0%	75.0%	75.0%	
2019	75.0%	64.3%			66.7%	55.6%		
2020	78.6%	75.0%			81.8%	54.6%		
2021	83.9%				69.2%			
2022	85.7%				80.0%			
Overall	**72.0%**	**58.3%**	**52.4%**	**43.4%**	**63.3%**	**48.5%**	**42.9%**	**34.4%**

Table 33: Annual Retention Rates of University ICT Graduates for 2 Largest Programs of Study

Graduation Year	Computer Science				Electrical and Electronics Engineering			
	1-Year	3-Year	5-Year	10-Year	1-Year	3-Year	5-Year	10-Year
2010	75.0%	58.3%	58.3%	50.0%	55.6%	44.4%	44.4%	33.3%
2011	58.3%	50.0%	41.7%	33.3%	55.6%	44.4%	44.4%	44.4%
2012	57.1%	50.0%	50.0%	42.9%	61.5%	53.9%	38.5%	38.5%
2013	53.9%	46.2%	46.2%	38.5%	45.5%	36.4%	36.4%	36.4%
2014	61.5%	53.9%	53.9%		61.5%	46.2%	46.2%	
2015	75.0%	60.0%	60.0%		57.1%	42.9%	42.9%	
2016	66.7%	47.6%	42.9%		54.6%	54.6%	45.5%	
2017	79.2%	62.5%	58.3%		64.3%	50.0%	50.0%	
2018	85.7%	71.4%	66.7%		58.3%	50.0%	41.7%	
2019	72.7%	63.6%			71.4%	57.1%		
2020	84.6%	73.1%			69.2%	61.5%		
2021	80.7%				83.3%			
2022	85.2%				81.8%			
Overall	**73.8%**	**59.0%**	**52.6%**	**41.2%**	**64.7%**	**52.3%**	**46.2%**	**37.2%**

Table 34: Annual Retention Rates of College ICT Graduates for 3 Largest Programs of Study

Graduation Year	Network & System Administration			Electrical, Electronic and Communications Engineering Technology			Computer Systems Analysis		
	1-Year	3-Year	5-Year	1-Year	3-Year	5-Year	1-Year	3-Year	5-Year
2014	100.0%	100.0%	100.0%	100.0%	80.0%	80.0%	100.0%	100.0%	100.0%
2015	66.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	50.0%	50.0%
2016	75.0%	75.0%	75.0%	83.3%	83.3%	66.7%	100.0%	100.0%	100.0%
2017	100.0%	100.0%	100.0%	81.8%	81.8%	81.8%	100.0%	50.0%	50.0%
2018	100.0%	85.7%	85.7%	92.3%	84.6%	84.6%	90.9%	81.8%	81.8%
2019	85.7%	85.7%		88.9%	88.9%		87.5%	87.5%	
2020	100.0%	100.0%		88.2%	82.4%		90.9%	81.8%	
2021	85.7%			93.8%			90.0%		
Overall	**89.0%**	**84.9%**	**82.5%**	**87.8%**	**81.6%**	**79.0%**	**90.9%**	**91.9%**	**88.0%**

Table 35: ICT Primary Applicants as a Share of Total Permanent Resident Landings

Landing Year	Total	ICT	ICT Share
2005-2009	3780	145	3.8%
2010-2014	4714	185	3.9%
2015	1080	35	3.2%
2016	1650	110	6.7%
2017	1535	265	17.3%
2018	2050	300	14.6%
2019	2655	380	14.3%
2020	1240	150	12.1%
2021	3085	245	7.9%
2022	4555	350	7.7%
2023	5275	405	7.7%
Total	**31 619**	**2570**	**8.1%**

Table 36: ICT Primary Applicants as a Share of Total Permanent Resident Landings by Immigration Stream

Landing Year	Provincial Nominee*	AIP*	Federal Skilled Worker**	Canadian Experience**	TR to PR**
2005-2009	5.5%	NA	11.7%	0.0%	NA
2010-2014	4.3%	NA	10.3%	23.5%	NA
2015	3.4%	NA	11.1%	22.2%	NA
2016	10.9%	NA	11.1%	22.2%	NA
2017	21.7%	25.0%	16.7%	50.0%	NA
2018	20.9%	6.0%	23.1%	42.9%	NA
2019	26.9%	3.7%	12.5%	43.5%	NA
2020	18.0%	5.1%	15.4%	36.8%	NA
2021	8.8%	6.7%	50.0%	18.2%	5.9%
2022	12.0%	4.7%	16.7%	17.9%	5.2%
2023	10.1%	5.7%	10.9%	32.4%	2.9%
Overall	**11.5%**	**5.4%**	**12.7%**	**27.9%**	**4.6%**

**NB Provincial Streams*

***Federal Steams*

Note: Temporary Resident to Permanent Resident Pathway – The TR to PR Pathway only operated during 2021, but those who applied before it ended that still had their applications processed and their work permits extended until December 2024

Table 37: Pooled Retention Rates of Primary Applicants, Non-ICT Occupations

Occupation	1-Year	3-Year	5-Year	10-Year
Management	84.7%	72.3%	62.4%	46.1%
Business, Finance, and Administration	84.7%	69.9%	63.0%	50.0%
Natural and Applied Sciences	78.4%	63.4%	57.8%	49.2%
Health	86.9%	76.2%	77.1%	67.8%
Education, Law, and Social Services	84.2%	72.8%	68.0%	57.0%
Art, Culture, Recreation, and Sport	79.2%	70.0%	62.9%	57.9%
Sales and Services	71.8%	60.7%	60.4%	54.5%
Trades, Transportation, and Equipment	68.0%	57.7%	55.3%	53.3%
Natural Resources, Agriculture, and Related Production	76.3%	70.4%	73.7%	75.0%
Manufacturing and Utilities	85.0%	80.1%	78.9%	71.9%
Other	87.3%	75.1%	68.7%	56.7%

Pooled analysis years are as follows: 1-Year rate (2005-2023), 3-Year rate (2005-2021), 5-Year rate (2005-2019), and 10-Year rate (2005-2014).

Table 38: Factors Associated with 1-Year Retention of ICT Graduates from Universities in NB

Variables	Odds Ratio	95% Confidence Interval	P-Value
Comparison Category: Gender = Male			
Female	1.038	0.799–1.350	0.779
Comparison Category: Previous Residence = NB			
International	7.879	6.056–10.249	< 0.001***
Province Outside NB	9.075	6.680–12.332	< 0.001***
Age at graduation (continuous in years)	0.982	0.958–1.007	0.159
Comparison Category: NB Post-secondary Institution = UNB			
MtA	1.514	0.788–2.909	0.213
UMoncton	0.680	0.503–0.919	0.012*
Comparison Category: Education Level = Undergraduate			
Postgraduate	0.636	0.484–0.836	0.001**

**** p<0.01, ** p<0.05, * p<0.1*

Table 39: Factors Associated with 1-Year Retention of ICT Graduates from Colleges in NB

Variables	Odds Ratio	95% Confidence Interval	P-Value
Comparison Category: Gender = Male			
Female	1.891	1.232–2.903	0.004**
Comparison Category: Previous Residence = NB			
International	0.467	0.273–0.799	0.005**
Province Outside NB	34.864	4.111–295.701	0.001**
Age at graduation (continuous in years)	1.058	1.037–1.079	< 0.001***
Comparison Category: NB Post-secondary Institution = CCNB			
NBCC	1.059	0.688–1.631	0.794

**** p<0.01, ** p<0.05, * p<0.1*

Table 40: Factors Associated with Duration of Permanent Residents with ICT Skills in NB – Cox Proportional Hazard Model

Variables	Hazard Ratio	95% Confidence Interval	P-Value
Comparison Category: Gender = Female			
Male	0.894	0.718–1.112	0.312
Age at landing (continuous in years)	0.761	0.645–0.898	0.001***
Age at landing (squared)	1.003	1.001–1.006	0.010***
Comparison Category: Years of Landing = 2020-2023			
2005-2009	1.043	0.682–1.594	0.847
2010-2014	0.677	0.455–1.007	0.054*
2015-2019	1.208	0.970–1.505	0.091*
Comparison Category: Immigration Stream = PNP			
AIP	1.346	0.945–1.917	0.100
Federal Skilled Worker	0.939	0.635–1.388	0.752
Canadian Experience	1.328	1.056–1.670	0.015**
TR to PR	2.235	1.366–3.657	0.001***
Comparison Category: Occupation = Information systems analysts & consultants			
Computer network technicians	1.023	0.711–1.471	0.904
Computer programmers and interactive media developers	1.061	0.797–1.413	0.683
Database analysts and data administrators	0.918	0.554–1.520	0.738
Information systems testing technicians	0.720	0.421–1.231	0.230
Software engineers and designers	1.189	0.887–1.593	0.246
User support technicians	0.850	0.642–1.123	0.253
Web designers and developers	1.316	0.784–2.211	0.299
Comparison Category: Official Language = English			
Both	0.938	0.266–3.305	0.920
French	1.345	0.304–5.949	0.696
Comparison Category: Country of Citizenship (>100 Landings) = India			
China	1.413	1.078–1.852	0.012**
Morocco	1.247	0.343–4.532	0.738
Nigeria	0.364	0.233–0.569	<0.001***
Philippines	0.774	0.547–1.096	0.149

**** p<0.01, ** p<0.05, * p<0.1*

Appendix B: Statistical Analyses

Factors Associated with 1-Year Retention of ICT Graduates from Post-Secondary Institutions in NB

$$log\frac{P(x)}{1-P(x)} = \beta_0 + \beta_1 Gender + \beta_2 PrevRes + \beta_3 Age + \beta_4 NBPSE + \beta_5 EduLevel \ldots (Equation\ 1)$$

Multivariate logistic regression is used to estimate the probability of an ICT university graduate from an NB university being retained in the province and the relative importance of different personal characteristics in association with retention. In the equation above, $log\frac{P(x)}{1-P(x)}$ is the log odds of an ICT graduate leaving the province one year after graduation.

The model accounts for various factors, including gender, previous residence (prior to enrolment), age at graduation, NB institution, and education level (only for university graduates).

A similar model is adopted to estimate the probability of an ICT college graduate from an NB college being retained in the province, with the same covariates as the university model except for education level, as shown in the equations below.

$$log\frac{P(x)}{1-P(x)} = \beta_0 + \beta_1 Gender + \beta_2 PrevRes + \beta_3 Age + \beta_4 NBPSE \ldots (Equation\ 2)$$

Factors Associated with Duration of Permanent Residents with ICT Skills in NB

To estimate factors associated with the duration of ICT-skilled permanent residents in NB, the CoxPH model was used in the following form:

$$h(t) = h_0(t) \times \exp(b_1 x_1 + \cdots + b_p x_p),$$

where

- t represents the time until an event occurs (leaving NB).
- $h(t)$ is the hazard function determined by a set of covariates $(x_1, \cdots, x_p)$. It represents the risk of the event occurring at time t, given that the individual has survived (been retained) up to time t.
- The coefficients $(b_1, \cdots, b_p)$ measure the impact of the covariates. A positive coefficient indicates an increased hazard (and thus a decreased survival time), while a negative coefficient indicates a decreased hazard (and thus an increased survival time).

- h_0 is the baseline hazard if all x_i are zero, representing the risk of the event at time t when all covariates are zero.

- $\exp(b_i)$ are hazard ratios. They represent the multiplicative effect on the hazard for a one-unit increase in the corresponding covariate.

This model was applied to examine the duration of stay for permanent residents with ICT skills and its predictors, allowing for the inclusion of observable covariates that may influence the probability of leaving. Individuals who were still residing in NB at the end of the study period (2024) are right censored in the analysis.

The hazard rate is the chance of an ICT PR leaving NB, given that they have not left until that point. A hazard ratio above 1 means a higher chance of leaving, while a hazard ratio below 1 means a lower chance than the base category.

For our analysis, the observable factors or covariates (base categories in parentheses) include gender (male), age at landing as a continuous variable, year of landing pooled into ranges (2020-2023), immigration stream (Provincial Nominee – PNP), official language (English) and country of citizenship (India) with at least 100 arrivals between 2005 - 2023.