

# Teacher Recruitment and Retention in New Brunswick



Ted McDonald, PhD  
Pablo Miah, MA, MSc

## **Project Title**

Teacher recruitment and retention in New Brunswick

## **Principal Investigator**

Ted McDonald, Director, NB-IRDT

## **Research Team**

Pablo Miah, Senior Data Analyst, NB-IRDT

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## Executive Summary

This study investigates the provincial and occupational retention rates of teachers in New Brunswick (NB). Schools and school districts in NB are faced with notable demographic shifts and a rising number of retirements among senior teachers. They are also challenged with the dual responsibility of upholding teaching standards and the ongoing recruitment and retention of their teachers. To help support the province's schools and districts in these goals, it is imperative to understand trends in teacher recruitment and retention in the province and to identify factors that may be associated with decisions to transition out of teaching.

Using a unique linked administrative data set that combines individual-level Teacher Payroll Data, Maritime Provinces Higher Education Commission Graduate Data and Citizen Data (Medicare Registry), we address three questions on different dimensions of teacher transitions:

- 1) At what rate do Bachelor of Education (BEd) graduates from NB post-secondary institutions live and work as teachers in NB?
- 2) What affects a teacher's decision to exit from employment in the public school system (including both retirement and pre-retirement exit)?
- 3) Do teachers that leave the NB public school system stay in NB or leave the province?

## Highlight of Findings

- 49% of female and 45% of male NB BEd graduates become teachers in the province.
- Approximately 72% of BEd graduates from Université de Moncton (UdeM) have worked as teachers in NB, which is a higher proportion than BEd graduates from the University of New Brunswick (36.8%) and St. Thomas University (42.3%).
- From 2004 to 2020, around 59% of BEd graduates who resided in NB prior to enrolment became teachers in NB, compared to 10% of graduates from outside Canada and 11% of domestic students from other provinces.
- Teachers in the Anglophone sector are more likely to leave the profession within the first five years, but teachers in the Francophone sector are more likely to leave over the longer term, especially towards retirement age.
- Five years after entering teaching in NB, over 90% of teachers remain in the profession.
- The percentage of employed teachers who leave the profession annually – that is, the annual attrition rate – is around 2-3%.
- Among teachers who left the profession, almost all (approx. 96%) remain in the province.

## Introduction

This study investigates the recruitment, retention and mobility of New Brunswick (NB) teachers over the period 2013-2021 and identifies potential factors influencing their transition decisions, using matched NB Teacher Payroll Data, Citizen (i.e., Medicare registry) Data, and Maritime Provinces Higher Education Commission Graduate Data.

## Background: Challenges Facing the NB Education System

In the face of marked demographic changes and increasing teacher retirement rates, schools and school districts in NB are tasked with maintaining standards of teaching quality while continuously recruiting new teachers and retaining teachers already employed in the public K-12 (Kindergarten through Grade 12) education system.

As teachers' qualities and abilities represent the most significant school-based factors contributing to student achievement and educational improvement (Nguyen et al., 2019), it is important that the province is able to effectively recruit and retain enough teachers to replace those who retire while providing incentives to existing teachers to remain in the profession. It is also vital to understand which NB communities and districts are experiencing more pronounced issues in retaining qualified teachers and which ones may require more concerted recruitment efforts to ensure equitable delivery of education in NB.

The past few years have seen a growing awareness of a shortage of teachers in NB, specifically in specialty areas such as French immersion and STEM classes. In 2018, the New Brunswick Teachers' Association (NBTA) announced it expected to lose 170 to 210 teachers to retirement every year for the next five years, with limited teachers able to fill those positions (Smith, 2018). Coupled with earlier research that revealed about 30 percent of Canadian teachers leave their jobs within their first five years of service (CTF, 2004), this projection may present a supply and demand imbalance for teachers in the NB education system.

By studying the recruitment, retention and mobility patterns of teachers in NB over the past decade, this report attempts to shed light on factors that shape teachers' choices to either remain within the profession or pursue different career paths. It scrutinizes three key facets of teacher transitions, including:

- 1) The rate at which Bachelor of Education graduates from NB post-secondary institutions choose to live and work as teachers in the province.
- 2) The factors influencing teachers' decision to exit from employment in the NB public school system, encompassing both retirement and pre-retirement exits.
- 3) Mobility decisions among teachers who leave the NB public school system, including whether they choose to stay in the province or relocate elsewhere.

## Literature Review: Factors Affecting Teacher Attrition and Retention

Nguyen et al. (2019) conducted a comprehensive meta-analysis of 120 studies in the United States published between 1984 and 2019, in which they explored key factors affecting teacher attrition and retention. Their study categorized these factors into three main groups:

- Personal factors
- School characteristics
- Policy interventions

Their findings revealed the following:

**Personal factors** including age, gender, race/ethnicity and qualifications all exhibited modest yet significant impacts on teacher attrition and retention. Specifically, younger, male and minority teachers displayed a greater propensity to exit the profession or switch schools when compared to their older, female and non-minority counterparts. The findings indicate that younger teachers, particularly those under 30, are more likely to leave the profession, while older teachers may enjoy greater job security. Minority teachers, such as Black, Hispanic, Asian and Native American educators, face a higher attrition rate. Gender also plays a role, with male teachers more prone to leaving. Additionally, higher educational and certification levels increase the likelihood of teachers staying in the profession.

**School characteristics** had varying degrees of influence on teacher attrition and retention. Educators were more inclined to remain at institutions characterized by elevated academic achievements, lower poverty rates, smaller enrolments and locations in suburban or rural areas, as opposed to those with lower academic performance, higher poverty rates, larger student populations and urban settings.

**Policy interventions** yielded a mix of outcomes concerning teacher attrition and retention. Salary incentives produced favourable effects when they were specifically targeted, substantial in magnitude and sustained over time. Similarly, mentoring and induction programs demonstrated positive impacts when they were comprehensive, of high quality and offered robust support. Conversely, other interventions like performance-based pay, alternative certification pathways and professional development initiatives yielded inconsistent or negligible effects.

This study similarly examines the effect of demographic characteristics (personal factors) on teacher attrition and duration but, because of data limitations, narrows its focus to the province of New Brunswick. For the decision to enter the teaching profession after completing a BEd, the analysis is limited to those individuals educated within the province. Personal factors examined include age, sex, school district, marital status and immigration status. A focus on NB provides evidence that may be used to support local recruitment and retention strategies.

School-related attributes and policy interventions are beyond the scope of this study but could be considered as the subject of future work.

## Data and Methodology

### Data

The results from this report are derived from a unique data set that combines matched, individual-level administrative data from three different data sets accessed through the New Brunswick Institute for Research, Data and Training (NB-IRDT), listed below.

#### **New Brunswick Teacher Payroll Data**

Excerpts from New Brunswick Teacher Payroll Data are provided by the NB Department of Education and Early Childhood Development (EECD). The data set includes information on teachers who have worked or still work in the New Brunswick K-12 (Kindergarten through Grade 12) public school system, including entry to and exit from teaching (i.e., attrition).

The data include start date in a teaching position, sex, teacher certification type, contract type, payroll status (full-time, part-time, casual, supply, etc.) and school district. NB Teacher Payroll Data spans the years 2013 to 2021 and includes data on all teachers employed at some point in this time period. Although the data set provides information on when teachers employed during this period started as teachers, it must be noted that any exits from the occupation before 2013 are not observed.

#### **Citizen Data**

The Citizen Data is a longitudinal administrative database that contains basic demographic and geographic information on all NB residents who have been issued a provincial Medicare card. Postal code and active Medicare status are used to indicate where a person is living in NB or the date they left NB. This study uses information contained in this data set from January 2010 until December 2022 and matches this data with NB Teacher Payroll Data to identify former teachers who leave the province.

#### **NB University Graduates (MPHEC Graduate Data)**

The NB University Graduates data set is provided by the Maritime Provinces Higher Education Commission (MPHEC) and holds information on graduates from public universities in NB. Among other variables, it includes information on students' graduation date, immigration status, sex, level of education (undergraduate, graduate, certification), field of study, program completion status and permanent province of residence.

The NB University Graduates data set is also matched to NB Teacher Payroll Data to flag Bachelor of Education (BEd) graduates in NB who end up teaching in the province. However, because this data set only includes information on individuals who graduated from public universities in NB, individuals who attended and graduated with a BEd from a



post-secondary institution outside NB or from a private university in the province cannot be identified in our analysis.

This analysis only includes years for which the educational institutions collected 12 full months (calendar year) of data.

## Methodology

### **Measuring Teaching Duration and Teacher Attrition**

The indicator for leaving the teaching occupation is based on the year that a teacher no longer appears in the NB Teacher Payroll data. Movement across teaching levels (i.e., teachers who move across various contract types, such as from supply teacher to Contract D) are still considered teachers as long as they are either Supply or Contract B, C, D or E. Leaves such as maternity leaves, administrative role breaks and study leaves are not treated as exits because these are not permanent exits. Teachers working as principals or at a district office are not flagged as exits because they are still paid through the Teacher Payroll.

If a teacher moves onto the EECD payroll (government part 1), they no longer appear in the Teacher Payroll data and are flagged as an exit from the teaching profession. Because the data ranges from 2013 to 2021, individuals who left teaching before 2013 are not observed in this study.

The length of time in the teaching profession is measured from the indicator “position start date” until exit from the Teacher Payroll data. Individuals who are still employed at the end of the study period (end of 2021) are treated as censored in the statistical analysis in that transitions occurring after the end of the data set are unobserved.

### **Location of Residence After Exit From Teaching**

This study uses the Teacher Payroll data matched to teachers' Medicare status in the Citizen Data to determine location of residence after exit from teaching. An “Active” Medicare status would indicate the individual still resided in the province after leaving their position as a teacher and may be either working in another position or retired.

A teacher is assumed to have left the province if that individual's Medicare status is classified as “Left the Province” or “Left Country.” Similarly, anyone whose status was “Terminated” for other reasons (excluding death) and remained “Terminated” for at least six months is considered to have left the province. A “Terminated” Medicare status indicates that an individual moved out of NB after leaving teaching; though, because of data limitations, we are unable to identify where the individual moved or what their labour force status might be.

## Becoming a Teacher in NB After Obtaining a Bachelor of Education in NB

Using the NB University Graduates data provided by MPHEC, we identify graduates from the Bachelor of Education (BEd) programs of NB post-secondary institutions.

Table 1 shows the NB post-secondary institutions offering Education degrees along with available calendar years of data.

**Table 1: Post-Secondary Institutions and Data Ranges\***

Institution	Years Available
University of New Brunswick	2004-2020
Université de Moncton	2004-2020
St. Thomas University**	2004-2020

\*Calendar years

\*\*STU offers a Bachelor of Education only, while UNB and UdeM offer Bachelor and Master of Education degrees.

NB University Graduate data is matched with the Teacher Payroll data to flag individuals who are present in the Payroll data after completing their BEd. The study can only observe graduates from NB public universities. Therefore, the location of study for individuals who graduated with a BEd from a post-secondary institution outside of NB or from a private university in NB cannot be identified. In addition, BEd degrees obtained from an NB public university prior to 2004 cannot be observed.

**To protect confidentiality, all counts in this study have been randomly rounded to the nearest 5.**

### Statistical Analysis

Statistical analysis allows us to disentangle various factors potentially affecting the transitions of interest in this report – including starting work as a teacher, exiting the profession and remaining in the province after exit. Technical details of the equations estimated are included in [Appendix 2](#).

### Limitations

Teachers may leave the profession for many reasons reflecting one's personal situation, characteristics of the school and job and preferable employment opportunities elsewhere. Due to limitations in the available administrative data, our focus is on observable personal factors (sociodemographic and geographic characteristics) contributing to teachers' decisions.

Factors such as job satisfaction and motivation, supportive school leadership, positive relationships with colleagues, autonomy and opportunities for professional growth, adequate compensation and benefits are not observable in routinely collected data and therefore are beyond the scope of this study.

Data at NB-IRDT are only available on the educational outcomes of graduates from NB public universities, and as such, our study of the decision to enter the teaching profession in NB is limited

to those individuals graduating after 2003 with a Bachelor of Education (BEd) degree from the three public NB universities offering this program:

- St. Thomas University (STU)
- The University of New Brunswick (UNB)
- Université de Moncton (UdeM)

Data on BEd graduates from private universities in NB (e.g., Crandall University) or from universities outside the province are not available, and therefore these graduates are categorized as non-NB BEd graduates.

Further, it is not possible to determine the labour force status of BEd graduates who do not enter the teaching profession in NB teaching with the data available at NB-IRDT.

## Descriptive Statistics

### Profile of NB Teachers

This section investigates the demographic profile of active teachers in New Brunswick (NB). The profile is extracted from the NB Teacher Payroll Data and the Citizen Data.

Table 2 shows the demographic profile of teachers in NB public schools who were active (i.e., teaching) at some point between 2013 and 2021 (calendar years). Each teacher is only counted once. For characteristics that might change over a teacher's tenure (i.e., certificate type), we use the most recent value observed. All counts are randomly rounded to the nearest 5.

**Table 2: Demographic Profile of NB Teachers (Full Sample)**

<b>N (active at some point 2013-2021)</b>	11,990
<b>Female</b>	9,090 (75.8%)
<b>Average Age – Most Recent (sd)</b>	46.50 (11.07)
<b>Average Years of Experience</b>	12.64
<b>Marital Status</b>	
<b>Married</b>	7,215 (60.2%)
<b>Other</b>	1,545 (12.9%)
<b>Single</b>	3,230 (26.9%)
<b>Payroll Status – Most Recent</b>	
<b>Full-Time</b>	11,435 (95.4)
<b>Part-Time</b>	555 (4.6%)
<b>Contract Type – Most Recent</b>	
<b>Contract B</b>	10,000 (83.4%)
<b>Contract C</b>	45 (0.4%)
<b>Contract D</b>	1,335 (11.1%)
<b>Contract E</b>	55 (0.5%)
<b>Other</b>	550 (5.5%)
<b>School District – Most Recent</b>	
<b>ASD-E</b>	1,755 (14.6%)
<b>ASD-N</b>	970 (8.1%)
<b>ASD-S</b>	2,625 (21.9%)
<b>ASD-W</b>	2,725 (22.7%)
<b>DSF-NE</b>	1,435 (12.0%)
<b>DSF-NO</b>	680 (5.7%)
<b>DSF-S</b>	1,795 (15%)
<b>Certification Type – Most Recent</b>	
<b>Certificate 4</b>	1,185 (9.9%)
<b>Certificate 5</b>	6,580 (54.9%)
<b>Certificate 6</b>	3,860 (32.2%)
<b>Interim</b>	195 (1.6%)
<b>Other</b>	175 (1.5%)

More than 75% of teachers who were active over the study period were female.

Over 60% of teachers were married, 26.9% were single and 12.9% were other categories.

The average duration of teaching experience was 12.64 years.

Most of the teachers (95.4%) were on full-time payroll status.

For the most recent contract type held by the teacher according to the payroll data, over 83% of teachers held Contract B (continuing contracts), followed by Contract D (term contracts) at 11.1%.

Anglophone School District West (ASD-W) and South (ASD-S) were two of the biggest school districts, with 22.7% and 21.9% of employed teachers, respectively.

Nearly 55% of teachers held Certificate 5, which requires an approved Bachelor of Education degree, a minimum of 156

university credit hours and a teaching certificate from NB or another province or territory. Close to one-third (32.2%) of teachers held Certificate 6, which has all the same requirements as Certificate 5 plus an approved Master of Education degree or a master's degree in a teachable subject with 30 credit hours.<sup>1</sup>

It is possible for a teacher to hold multiple contracts in one calendar year; as such, this study estimates counts by contract type in two periods: May and October of each year. [Table 3](#) exhibits trends by contract type in May for the years between 2013 and 2021. Generally, over 80% of teachers were under "Contract B" each year.

"Other" contracts, which include supply teachers, typically constituted 2-3% of active teachers each year. However, in 2019 and 2020, the share of "Other" contracts jumped to 7.8% and 8.4%, respectively. The spike in those two years was mainly due to much higher numbers of supply teachers in the Anglophone school sector. This sudden spike could also be a result of the reclassification of some existing supply teachers in the system.

Counts and trends by contract type in October of each year between 2013 and 2021 are shown in [Table 8](#) in the Appendix.

**Table 3: Active Roster by Contract Type (Status as of May)**

<b>Contract Type</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>
<b>Contract B</b>	87.3%	85.8%	84.5%	84.3%	83.4%	82.6%	77.9%	78.0%	85.4%
<b>Contract C</b>	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.4%	0.4%	0.5%
<b>Contract D</b>	10.1%	12.0%	12.9%	12.4%	13.0%	14.0%	13.5%	13.0%	10.8%
<b>Contract E</b>	0.5%	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%	0.3%	0.4%
<b>Other</b>	1.9%	1.8%	2.1%	2.8%	3.1%	2.9%	7.8%	8.4%	3.0%
<b>Total</b>	8,690	8,835	8,980	8,715	8,350	9,150	9,300	9,510	9,670

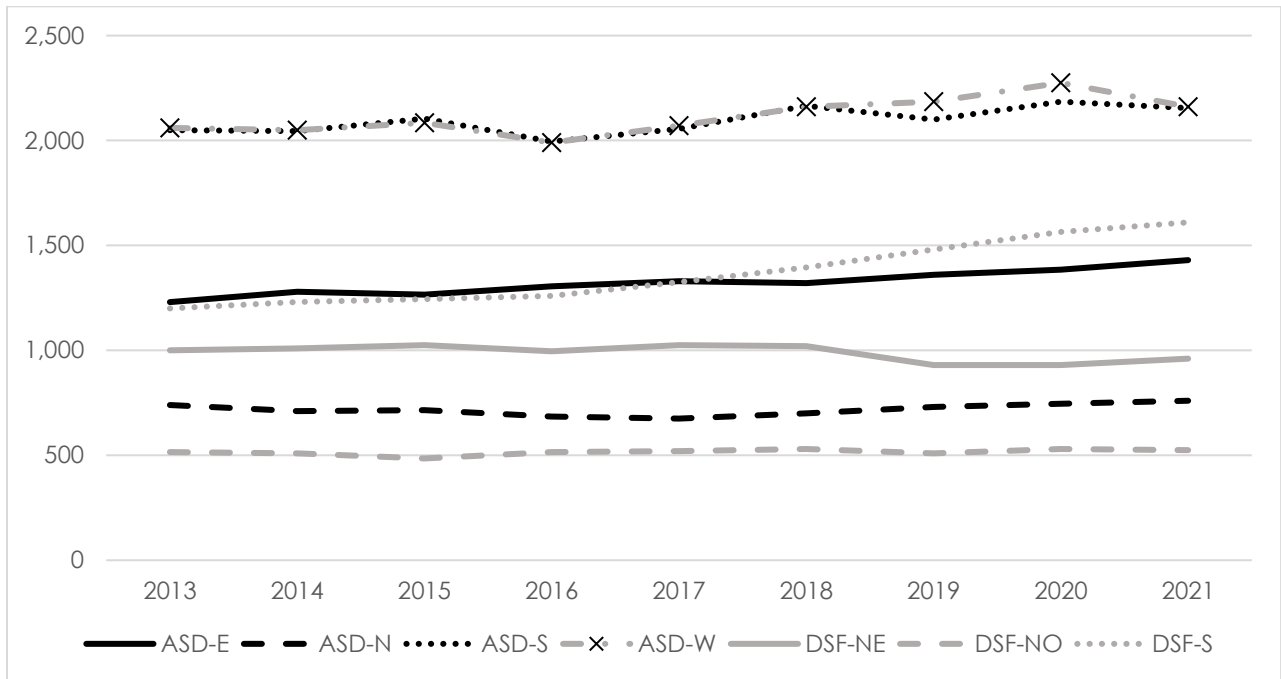
*Note: All counts in this report are randomly rounded to the nearest 5 to protect confidentiality.*

An individual may teach in multiple school districts in one year, and [Figure 1](#) below depicts yearly trends for the number of active teachers in May in all seven school districts. The two largest school districts, Anglophone School District West (ASD-W) and Anglophone School District South (ASD-S), consistently had a notably higher share of teachers compared to other school districts. Among Francophone school districts, the share of teachers in DSF-S increased steadily from 2017 onwards.

The counts and trends by school district in October are similar to those in May of each year between 2013 and 2021 and are reported in [Figure 16](#) in the Appendix.

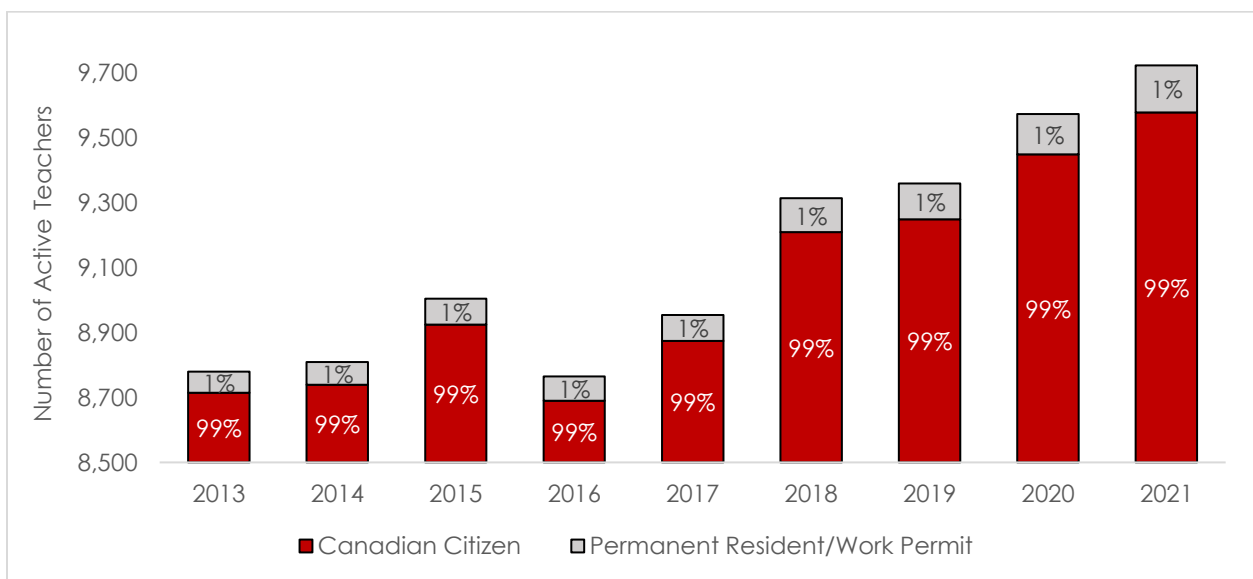
<sup>1</sup> Certificate 6 may also include a non-degree program with 30 credit hours at the 6000 level in teachable subjects that leads to an additional major, two additional minors or an additional minor and one concentration (Government of New Brunswick, n.d.).

**Figure 1: Active Roster of Teachers by NB School District (Month: May)**



Disaggregating the active roster by immigration status (Figure 2) shows that only about 1% of active teachers were permanent residents or on a work permit during the study period. It should be noted that immigration status is observed in the Citizen Data (Medicare status) during registration; thus, if a landed immigrant becomes a citizen and moves to NB from another province, they would likely be classified as non-immigrant citizens.

**Figure 2: Active Roster of Teachers by Immigration Status**

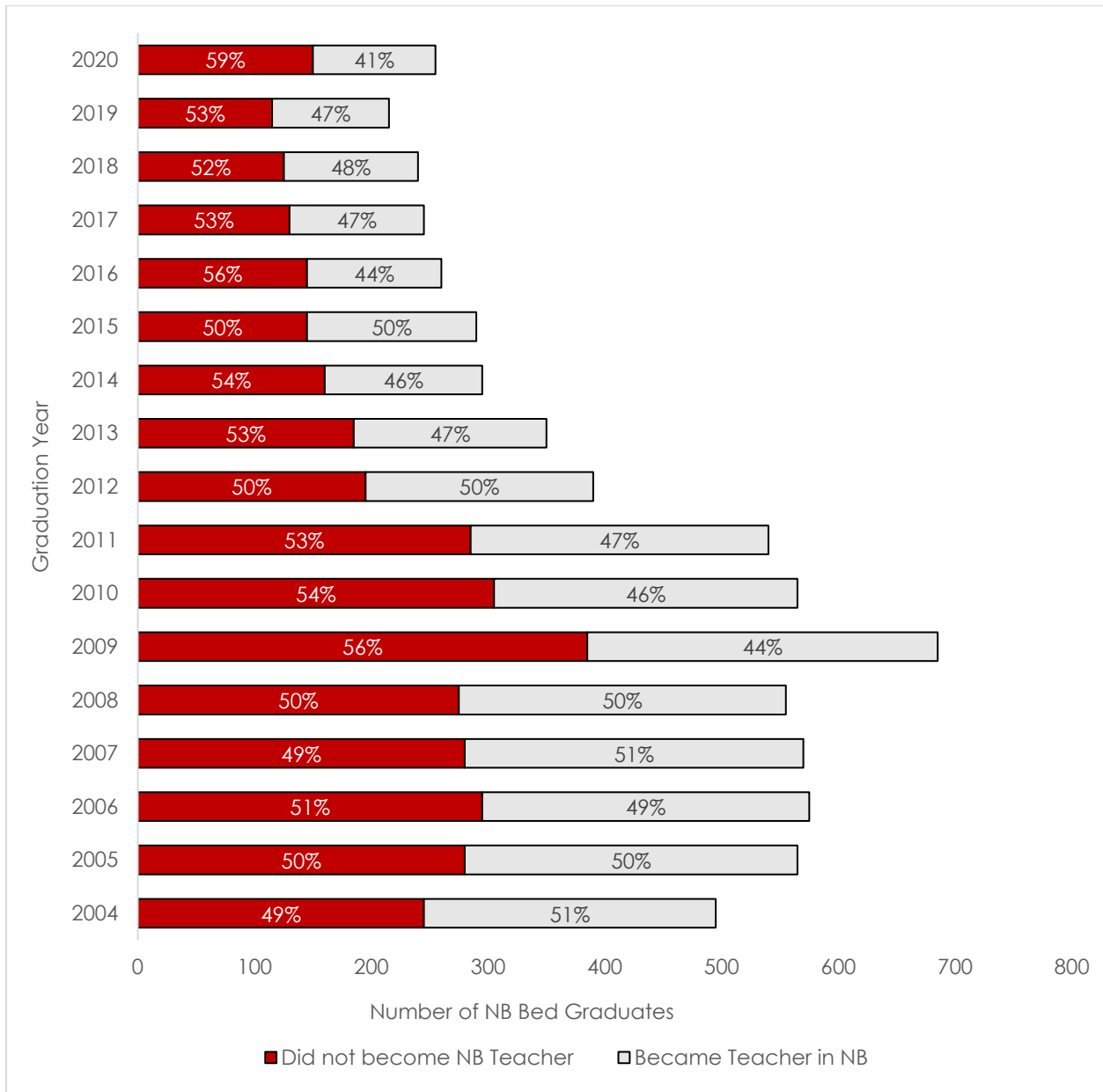


## Becoming a Teacher in NB After Obtaining a Bachelor of Education in NB

Three public universities in NB offer a Bachelor of Education (BEd) degree: the University of New Brunswick (UNB), St. Thomas University (STU) and Université de Moncton (UdeM).<sup>2</sup>

The number of BEd graduates from NB universities has fluctuated over the years as shown in Figure 3. However, a downward trajectory in the number of graduates can be observed since 2009, with numbers falling to around 250 NB BEd graduates per year in recent years.

**Figure 3: Bachelor of Education Graduates from NB Institutions by Calendar Year**



<sup>2</sup> Both UNB and UdeM also offer a Master of Education degree program.

Of those who graduated with a BEd between 2013 and 2019, the share of individuals who started teaching in NB is close to half (between 45% to 50%). The 2020 graduate cohort had the lowest share of graduates teaching in NB, at 41% (Figure 3). However, it is important to note that graduates who become teachers in NB might not necessarily do so immediately after graduation. For the more recent years, time since graduation is shorter, some graduates who were not yet teaching in 2020 may still enter the profession in NB in the future. Because there is only one additional year of Teacher Payroll data (until 2021) available for graduates in 2020, it is also possible that some graduates from more recent cohorts may already be teaching, but information on their teaching status is not included in the currently available data.

Figure 4 explores this further by showing the share of NB teachers (with an NB BEd) who began teaching in NB the same year they graduated. In earlier graduation cohorts, around 25-35% of NB teachers who graduated in a certain year started teaching the same year. For more recent cohorts, the proportion of graduates becoming teachers in their graduation year is higher, which is not surprising because there are fewer years of recent Teacher Payroll data.

For example, in 2013, 350 individuals graduated with an NB BEd, and 165 of those graduates eventually became teachers in the province (see Figure 3 above). Then in Figure 4, we see that of those 165 NB teachers, 39% began their teaching career in NB in 2013 – the same year as their graduation. The remaining 61% became teachers in later years.

Results suggest that fewer than 50% of graduates in a given year will become teachers in NB (Figure 3). Of those that do, roughly half enter teaching in the year of graduation (Figure 4).

**Figure 4: Share of NB Teachers (NB BEd Graduates) who Became Teachers in Their Graduation Year**

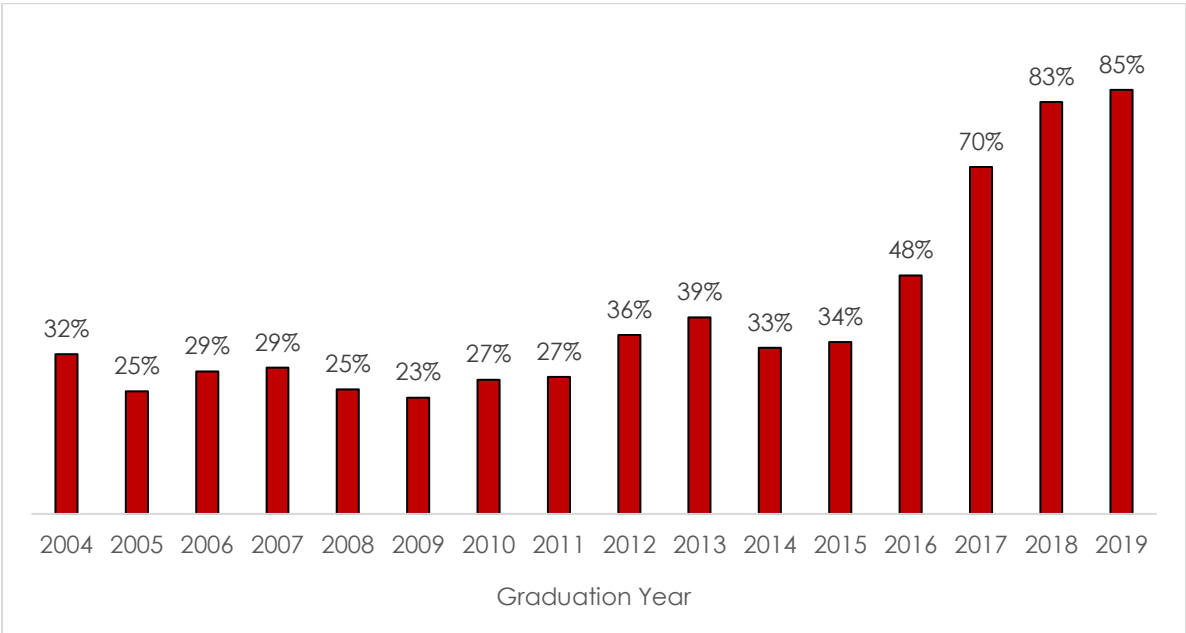




Table 4 provides a demographic breakdown comparing BEd graduates from post-secondary institutions in NB who became a teacher in NB (at any point) and those who did not become a teacher in NB.

**Table 4: Demographic Profile of NB BEd Graduates**

	<b>Became a Teacher in NB (Anytime)</b>	<b>Did not Become a Teacher in NB</b>
<b>N</b>	3,390 (47.7%)	3,710 (52.3%)
<b>Sex</b>		
<b>Female</b>	2,610 (48.6%)	2,755 (51.4%)
<b>Male</b>	780 (45.0%)	955 (55.0%)
<b>Average Age at Entry (sd)</b>	28.73 (5.69)	27.53* (6.80)
<b>Marital Status</b>		
Married	1,550 (67.4%)	750 (32.6%)
Other	245 (65.3%)	130 (34.7%)
Single	1,590 (53.5%)	1,380 (46.5%)
Unknown	0 (0%)	1,455** (100%)
<b>Master's Degree Holder</b>	500 (71.4%)	200 (28.6%)
<b>University Attended (BEd)</b>		
STU	550 (42.3%)	750 (57.7%)
UNB	1,400 (36.8%)	2,400 (63.2%)
UdeM	1,435 (71.8%)	565 (28.3%)

\*Age at completion of NB BEd

\*\*Not matched to Citizen Data

All counts in this report are randomly rounded to the nearest 5 to protect confidentiality.

During the study period, approximately 49% of female NB BEd graduates became teachers in NB public schools, while 45% of male BEd graduates took up teaching roles in NB.

Within the same timeframe, over 67% of NB BEd graduates who were married became teachers in the province. It should be noted, though, that marriages also may have occurred after beginning work as a teacher. Those with "Unknown" marital status could not be matched to the provincial Medicare, meaning it is likely they left the province after graduation.

Among NB universities, UdeM had the highest share of BEd graduates who eventually started teaching in the province, at 71.8%, followed by STU (42.3%) and UNB (38.8%). The notable difference in proportions among universities may be attributed to graduates' location of residence prior to enrolment.

Previous research by NB-IRDT (Bhuiyan et al., 2021) finds that UdeM has, by far, the highest proportion of graduates from New Brunswick (80%) compared to the other public universities, including UNB (58%) and STU (74%). The earlier findings indicate that graduates originally from NB

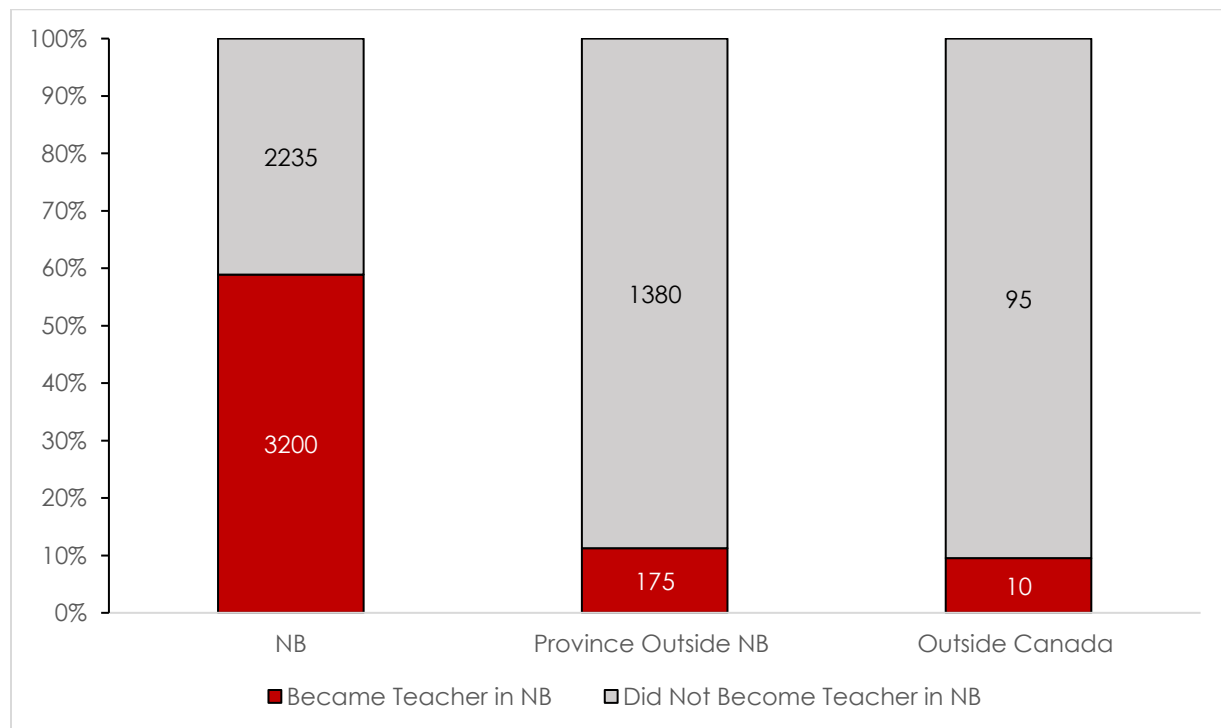
are more likely to remain in the province compared to graduates not from NB.<sup>3</sup> Of the three schools, UdeM's proportion of out of province graduates is by far the lowest, at 7% (compared to 25% for UNB and 21% for STU)– though, STU has the lowest proportion of graduates from out of country, at 5% (compared to 13% for UdeM and 17% for UNB) (Bhuiyan et al., 2021).

Additionally, UdeM is a French language university with a Francophone student base, while UNB's and STU's Bachelor of Education programs are in English with an Anglophone student base. In terms of labour market opportunities, Anglophone students have more English language teaching opportunities in the rest of Canada, whereas NB's bilingual status and Francophone school districts may mean there are more opportunities to teach in French in NB (whether at a French school or in a French immersion program at an English school) (see Emery et al., 2019).

The estimates in [Figure 5](#) similarly show that location of residence prior to enrolment is a factor that may influence whether a graduate remains in the province.

For the 2004-2020 pooled cohort of graduates, around 59% of BEd graduates who resided in NB prior to enrolment became teachers in NB. Of the 105 graduates who resided outside Canada before enrolling, about 10% became teachers. For the 1,555 BEd graduates with a previous residence in other provinces (domestic students), approximately 11% ended up teaching in NB.

**Figure 5: NB BEd Graduates by Previous Residence, Pooled: 2004-2020**



<sup>3</sup> 1-year retention rates for university graduates and college graduates from NB are 89% and 97%, respectively, compared to 30% for university graduates and 27% for college graduates from Out of Province (Bhuiyan et al., 2021).

Table 5 illustrates that, over the study period, NB BEd graduates from UdeM were about one year younger than STU graduates and two years younger than UNB graduates. Similarly, in Table 6, age at entry into teaching occupation for the Francophone sector was about two years younger than age of entry into the Anglophone sector.

The findings from both tables indicate that graduates from STU and UNB were older than graduates from UdeM when they completed their program, which is associated with an older age at entry into teaching. For graduates from all three institutions, there were typically 2-3 years between graduation and commencing work as a teacher in NB.

**Table 5: Age at Graduation by Institution**

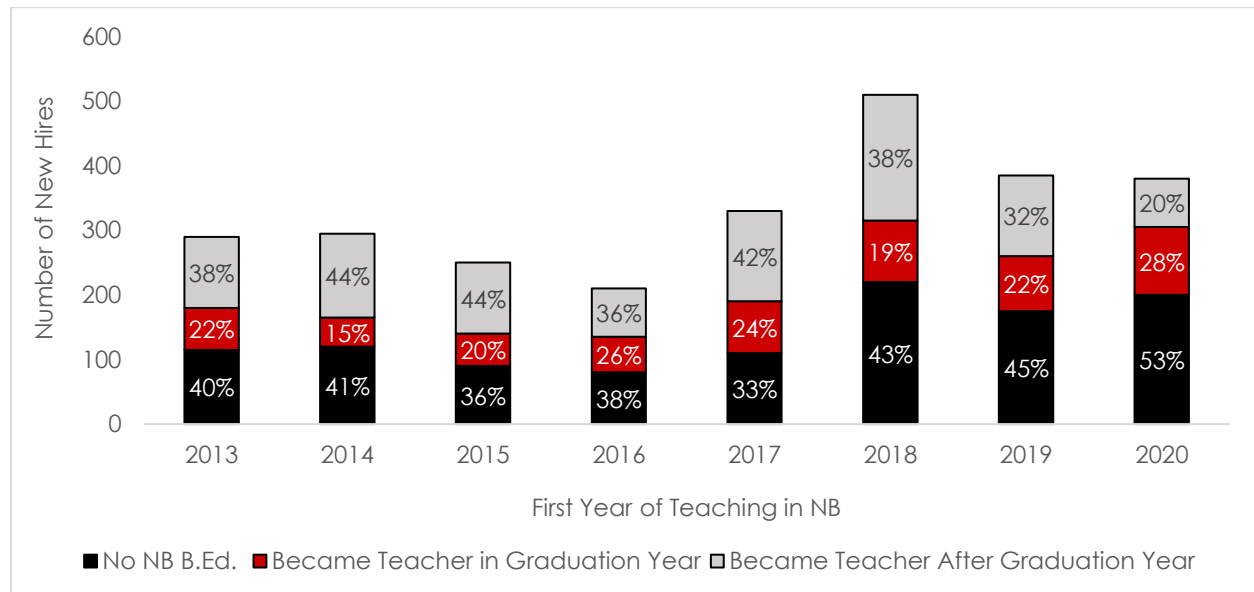
STU		UNB		UdeM	
Mean Age	Median Age	Mean Age	Median Age	Mean Age	Median Age
25.33	24	27.67	25	24.4	23

**Table 6: Age at Entry in Teaching by Sector**

Anglophone		Francophone	
Mean Age	Median Age	Mean Age	Median Age
29.7	28	27.17	26

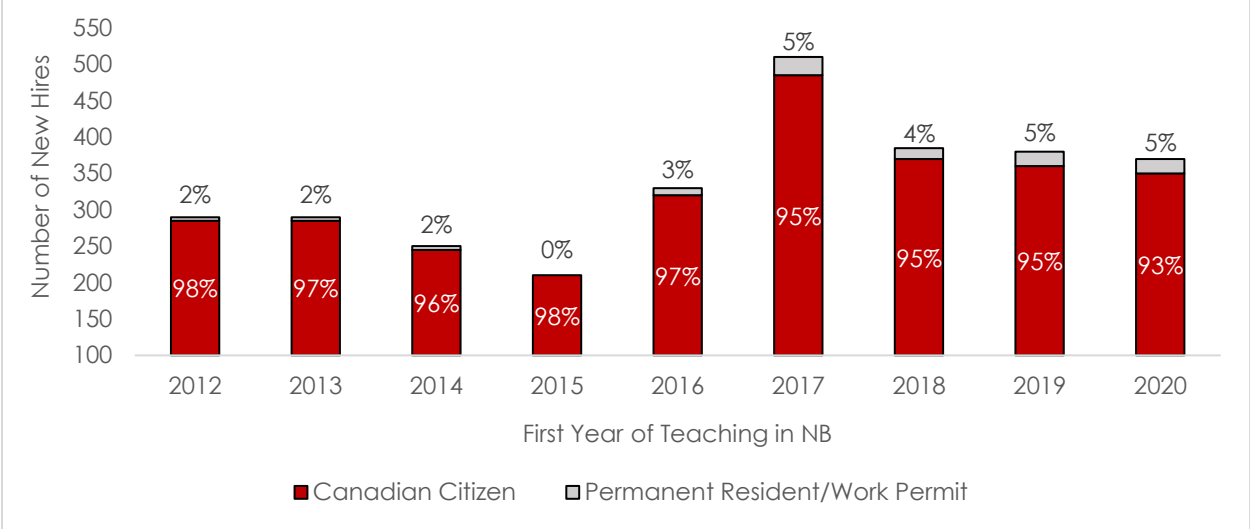
Between 2013 and 2020, approximately 58% of new teachers in NB public schools held a BEd from one of the public universities in NB (Figure 6). Among those new hires, around 20% graduated the same year they started teaching in the province.

**Figure 6: Share of New Hires With NB BEd**



Disaggregating new hires by immigration status in [Figure 7](#) shows that the vast majority were Canadian citizens. However, since 2017, the share of new teachers who were permanent residents or hold work permits increased to 5%, compared to 3% or lower prior to 2017.

**Figure 7: Share of New Hires by Immigration Status**



**Employment Attrition and Duration**

Duration of teachers' employment is estimated from a teacher's "position start date" until their exit from the Teacher Payroll data. Due to constraints on available data, such exits can only be observed from 2013 onwards. It should be noted that changing contract types and/or school districts, taking maternity or study leaves and participating in administrative role secondments are not considered exits from teaching.

**Teacher Attrition (2013-2021)**

Among teachers who left their occupation within five years of starting, 13% worked part-time. In comparison, 8% of those who remained in their position past the first five years worked part-time ([Table 7](#)). "Other" contract employees, including supply teachers, made up a higher proportion (14.2%) of those who left teaching within five years compared to teachers who remained (3.3%).

When we disaggregate by school district, we see that Anglophone School District East (ASD-E) had the highest rate of teacher exits within 0-5 years, while ASD-W and ASD-S retained a higher proportion of teachers for five years. Of the teachers who left their positions, 31.3% of departures were from ASD-E.

Almost 73% of teachers retained for five years held a Certificate 5, while just under half (49.5%) of those who left also held a Certificate 5.

**Table 7: Profile of Teachers who Left and Stayed Within 5 Years of Commencing Teaching**

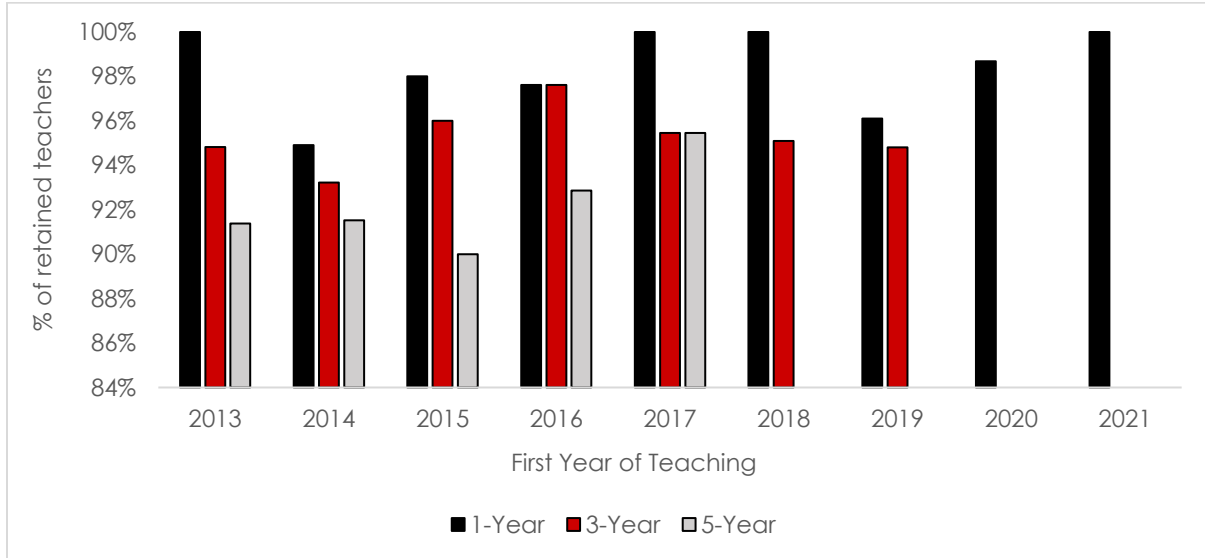
	Left Teaching Within 5 Years		Did not Leave Teaching Within 0-5 Years*	
	All	With NB BEd	All	With NB BEd
<b>N</b>	495	100	2,105	1,050
<b>Female</b>	350 (70.7%)	80 (80%)	1,605 (76.2%)	805 (76.7%)
<b>Average Age – Most Recent (sd)</b>	45.05(12.72)	32.56(7.23)	34.3251 (8.5183)	31.6061 (6.0949)
<b>Marital Status</b>				
<b>Married</b>	270 (54.5%)	35 (35%)	755 (35.9%)	280 (26.7%)
<b>Other</b>	75 (15.2%)	10 (10%)	155 (7.4%)	50 (4.8%)
<b>Single</b>	145 (29.3%)	55 (55%)	1,195 (56.8%)	720 (68.6%)
<b>Highest Degree – Master’s (NB PSE)</b>	35	10	105	0
<b>Highest Degree - Bachelor’s (NB PSE)</b>	90	90	1,050	1,050
<b>Average Years of Experience</b>	3.22	3.12	2.2845(1.5717)	2.5557 (1.5130)
<b>Payroll Status – Most Recent</b>				
<b>Full-Time</b>	425 (85.9%)	85 (85%)	1,930 (91.7%)	965 (91.9%)
<b>Part – Time</b>	65 (13.1%)	15 (15%)	175 (8.3%)	85 (8.1%)
<b>Contract Type – Most Recent</b>				
<b>Contract B</b>	270 (54.5%)	35 (35%)	1,050 (49.9%)	550 (52.4%)
<b>Contract C</b>	0	0	25 (1.2%)	0
<b>Contract D</b>	155 (31.3%)	60 (60%)	935 (44.4%)	450 (42.9%)
<b>Contract E</b>	0	0	25 (1.2%)	10 (1.0%)
<b>Other</b>	45 (14.2%)	5 (5%)	70 (3.3%)	40 (3.8%)
<b>School District – Most Recent</b>				
<b>ASD-E</b>	155 (31.3%)	15 (5%)	365 (17.3%)	80 (7.6%)
<b>ASD-N</b>	70 (14.1%)	20 (20%)	175 (8.3%)	75 (7.1%)
<b>ASD-S</b>	90 (18.2%)	20 (20%)	450 (21.4%)	225 (21.4%)
<b>ASD-W</b>	75 (15.2%)	25 (25%)	475 (22.6%)	300 (22.6%)
<b>DSF-NE</b>	45 (9.1%)	10 (10%)	135 (6.4%)	95 (6.4%)
<b>DSF-NO</b>	30 (6.1%)	0 (0%)	85 (4.0%)	55 (4.0%)
<b>DSF-S</b>	35 (7.1%)	10 (10%)	420 (20.0%)	220 (20.0%)
<b>Certification Type – Most Recent</b>				
<b>Certificate 4</b>	55 (11.1%)	5 (5%)	105 (5.0%)	0
<b>Certificate 5</b>	245 (49.5%)	85 (85%)	1,535 (72.9%)	965 (91.9%)
<b>Certificate 6</b>	115 (23.2%)	10 (10%)	305 (14.5%)	80 (7.6%)
<b>Interim</b>	45 (9.1%)	0 (0%)	80 (3.8%)	0
<b>Other</b>	35 (7.1%)	0 (0%)	80 (3.8%)	5 (0.5%)

\*Includes all teachers within the first five years of starting as a teacher who did not exit teaching as of the end of the sample period.

PSE = post-secondary education institution. All counts in this report are randomly rounded to the nearest 5 to protect confidentiality.

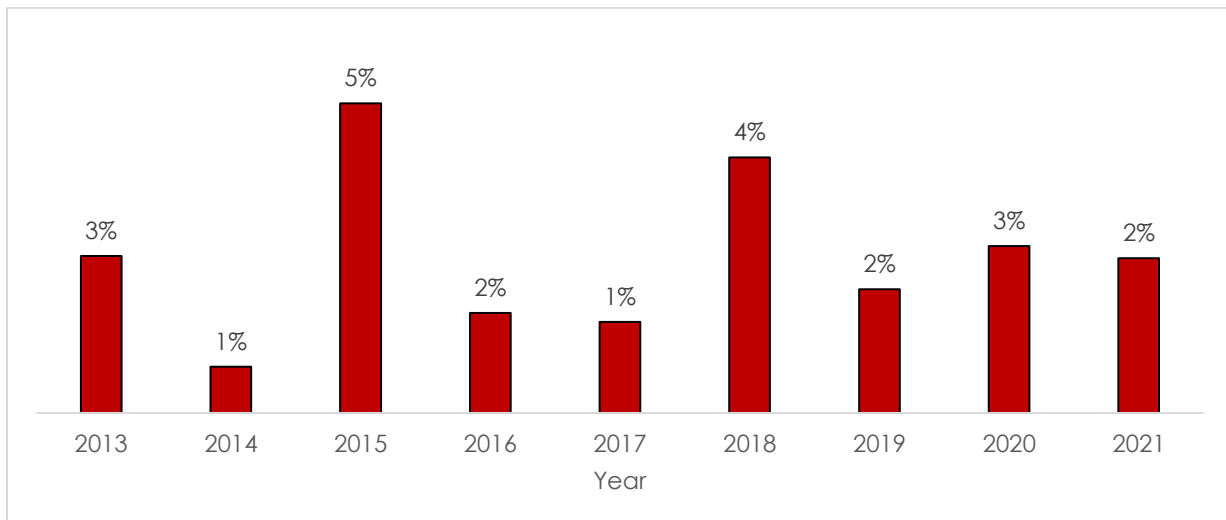
The 1-year retention rate for NB teachers between 2013 and 2021 is around 98%. Three years after starting teaching, around 95% of teachers remained in their profession, and after five years about 92% were retained ([Figure 8](#)).

**Figure 8: 1-, 3-, and 5-Year Retention Rates of NB Teachers After First Year of Employment**



[Figure 9](#) shows the yearly attrition rate from the active NB teacher roster. Other than in 2015, fewer than 5% of teachers left their profession in the province each year – either due to retirement, leaving the occupation or teaching elsewhere.

**Figure 9: Yearly Attrition Rate (From Active Roster)**



Among those who exited teaching in the Anglophone sector, 10% were between 24-34 years old when they left ([Figure 10](#)). The share of the same age group leaving the Francophone sector was only 5%. However, a higher share of teachers in the Francophone sector left teaching at age 65 or above (16%) compared to those in the Anglophone sector (8%).

This indicates that among younger teachers, Francophone teachers are more likely to remain teaching in NB. However, among older teachers, teachers in the Francophone sector are more likely to leave teaching.

**Figure 10: Distribution of Age at Exit (From Active Roster)**

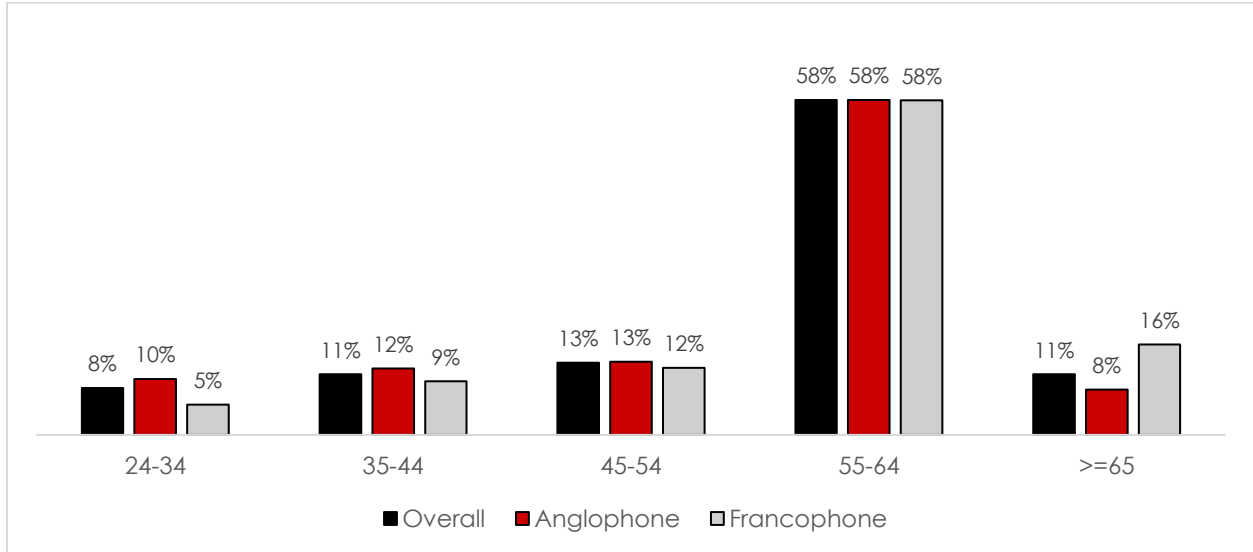
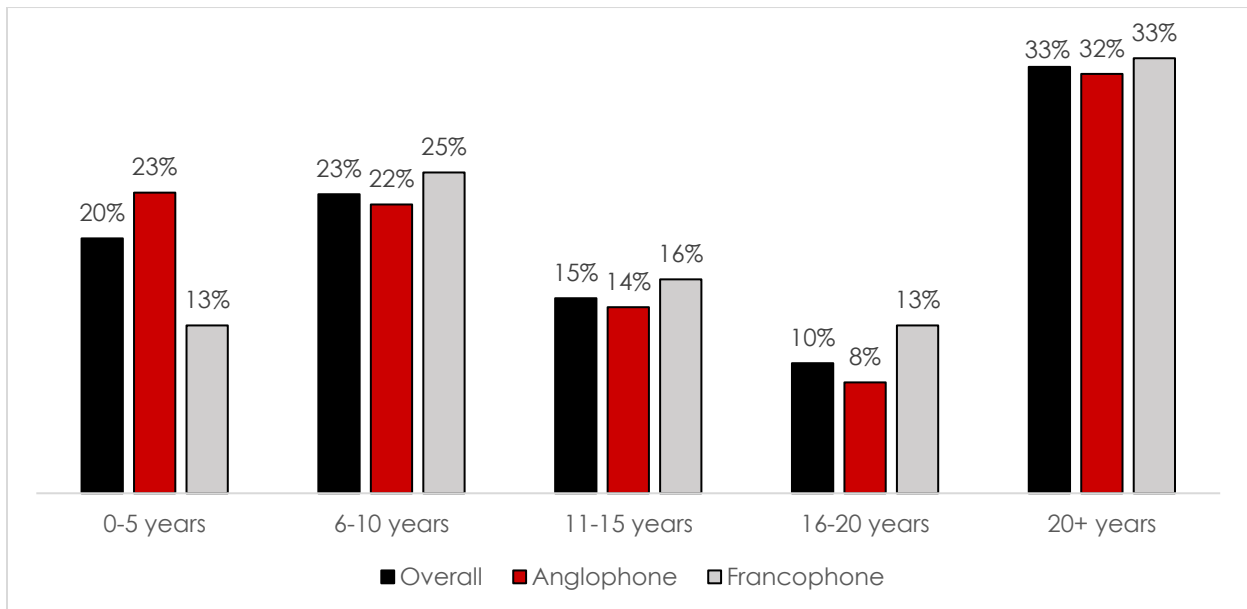


Figure 11 presents the distribution of teaching experience at exit from the active teaching roster among those teachers who left teaching. About 23% of Anglophone teachers who left their profession did so with only 0-5 years of experience, compared to about 13% of Francophone teachers. In contrast, 13% of exiting teachers in the Francophone sector did so with 16-20 years of experience, compared to 8% of teachers in the Anglophone sector.

**Figure 11: Distribution of Teaching Experience at Exit (From Active Roster)**

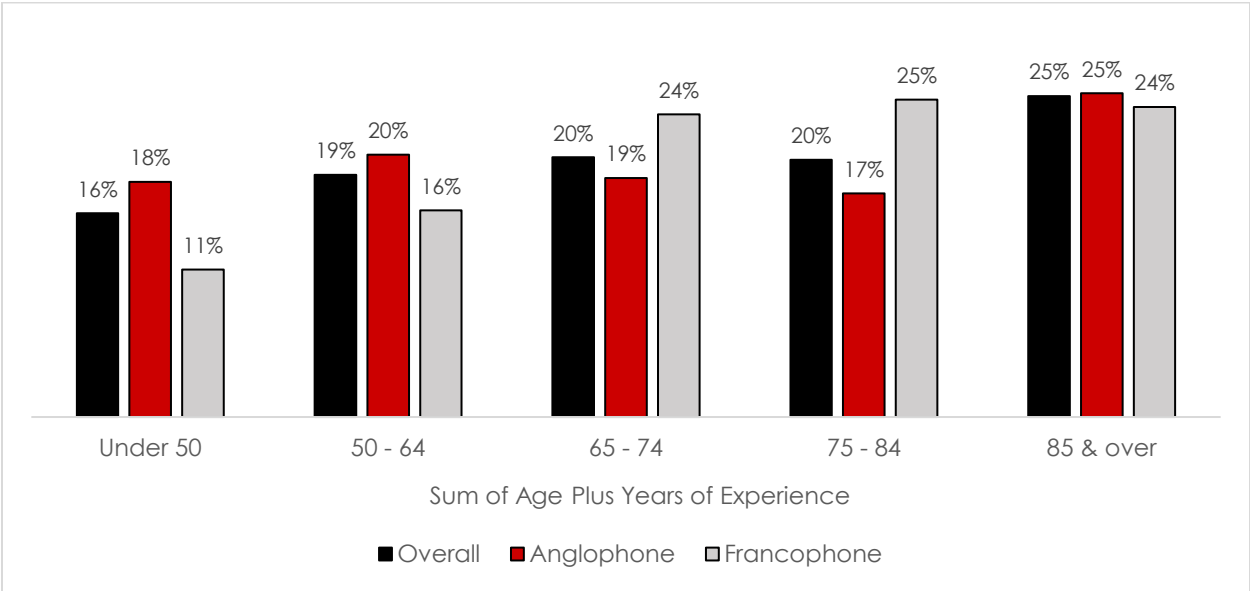


Retirement constitutes one of the main reasons for exit from teaching; and retirement decisions for most teachers will be based on pension rules that consider the sum of age and experience as the key determinant of pension eligibility and amount. Since Francophone teachers enter the profession at a younger age on average than Anglophone teachers, it is possible that they may be reaching retirement eligibility sooner.

The distribution for the combination of age and experience is shown in [Figure 12](#). For both Anglophone and Francophone teachers, among those who exited the profession between 2013 and 2021, around 25% left when their age plus years of service equaled 85 years or more. Interestingly, another 25% of Francophone teachers left when age plus service equaled 75-84 years, compared to 17% for Anglophone teachers who left when age plus service equaled 75-84 years. Similarly, another 24% of Francophone teachers leaving the profession did so when age plus service equaled between 65 and 74 years, compared to 19% of Anglophone teachers.

Conversely, a larger share of Anglophone teachers left the profession when the sum of age plus experience was lower than for Francophone teachers.

**Figure 12: Distribution of Age and Experience at Exit (From Active Roster) by Sector**



**Location of Residence After Exit From Teaching**

The location of teachers who leave their profession is based on their “Active” Medicare status in the Citizen Data. A former teacher is assumed to have left the province if their Medicare status is either “Left the Province” or “Left Country,” or if it is “Terminated” for more than six months for other reasons (excluding death).

[Figure 13](#) shows the proportion of ex-teachers living in NB (as of 2021) based on the year they exited teaching. It indicates that, apart from teachers who exited the profession in 2013 and



2017, around 96% of former public school teachers still resided in the province. This may indicate that these ex-teachers either retired from their profession or were employed elsewhere – such as in a private school or a different occupation.

**Figure 13: Ex-Teachers Living in NB, by Year of Exit From Teaching**

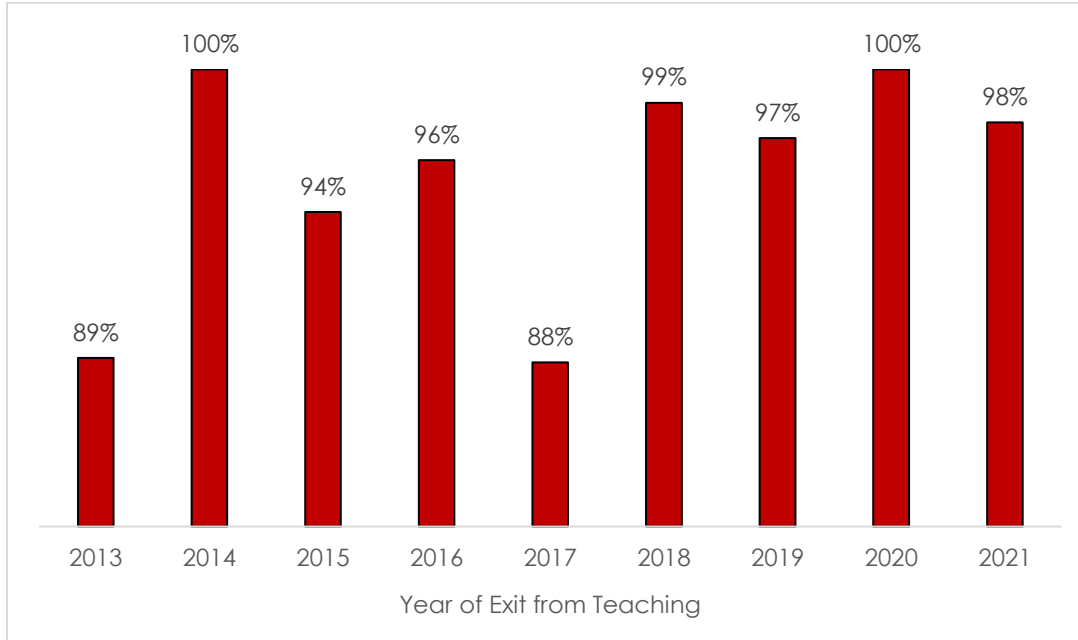
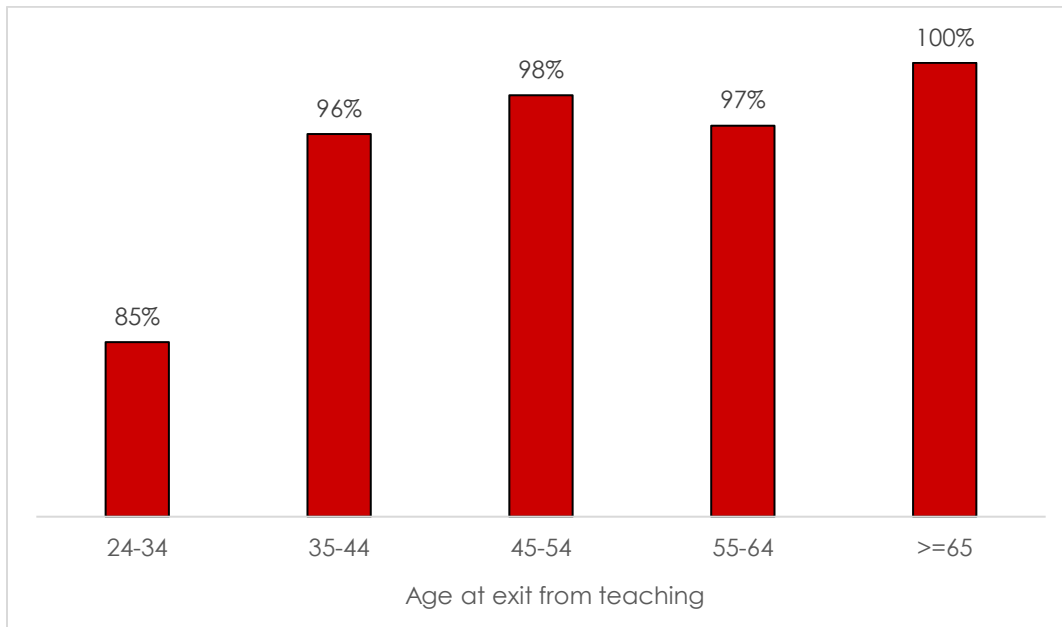


Figure 14 below shows that approximately 85% of former public school teachers aged 24 to 34 continued to live in NB. For older age groups, provincial retention rates surpass 95%. Notably, all teachers aged 65 and above who retired between 2013 and 2021 remained in the province.

**Figure 14: Ex-Teachers Living in NB, by Age at Exit From Teaching**



## Statistical Analysis

### Factors Associated With Teaching Duration

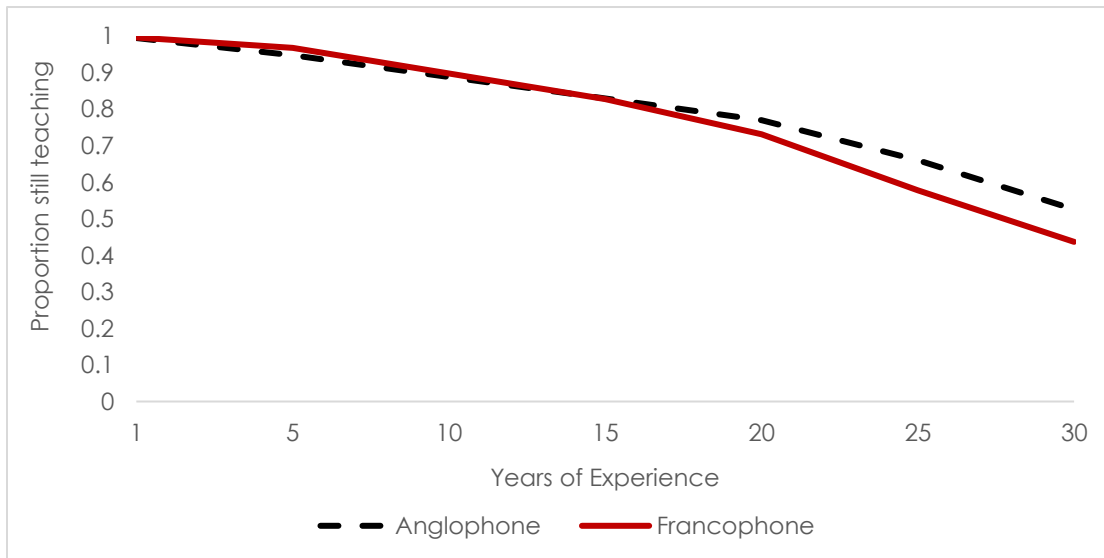
Kaplan-Meier (KM) analysis is a method used to illustrate how much time elapses before a particular event occurs, which is termed “survival” in the literature. For teachers, Kaplan-Meier curves illustrate how likely a teacher is to leave the profession as of a certain time given that they remained working until that time.

The KM survival curves in [Figure 15](#) can be interpreted to be the proportion of teachers who are still teaching as of a given level of experience. The lines for both Anglophone and Francophone sectors start at 1 (or 100%) by definition because everyone is an active teacher when they start working; but as time passes, more and more teachers will exit the profession.

The results presented below echo our descriptive statistics findings. Until teachers reach 15 years of experience, both school districts have similar “survival” rates, indicating that at 15 years of experience, around 82% of teachers in both sectors are still working as teachers.

As their years of experience increase, however, Francophone teachers are more likely to exit teaching. At 30 years of experience, 43% of Francophone teachers are still in the profession compared to 53% of Anglophone teachers.

**Figure 15: Kaplan-Meier Analysis of Retention by School Sector**



In [Table 9](#) (see Appendix), we estimate duration regression models that account for various factors that may affect the decision to exit teaching, including school sector, payroll status, sex, marital status, certificate type, first year of teaching, immigration status and age at entry into teaching.

The Hazard ratio estimate of greater than 1 implies higher risk of exit from teaching, while a ratio lower than 1 signifies lower risk (i.e., longer duration working as a teacher).

Other things equal, our findings reveal the following (overall):

- Francophone sector teachers exhibit a higher likelihood of leaving the profession compared to their Anglophone sector counterparts, after controlling for other factors.
- Full-time teachers have a higher likelihood of remaining in the profession compared to part-time teachers.
- Individuals with single marital status are more prone to leaving the teaching profession in NB relative to their married counterparts.
- Those holding Interim Certificates are significantly more likely to exit the teaching profession compared to individuals with Certificate 5 qualifications.

To allow for variations in teaching tenure by location of education in NB,<sup>4</sup> we estimate another model by restricting the sample to individuals born after 1982 (where we are confident that we can identify whether the person was educated in NB) and include a similar set of observable factors as well as location of education for the BEd in [Table 10](#) (see Appendix).

The results indicate that:

- Among younger teachers, those in the Francophone sector are more likely to stay in the profession than their Anglophone counterparts, other things equal.

That is, when we restrict the sample to younger teachers, we see that Anglophone teachers are more likely to leave the profession. This may suggest that retention within the teaching profession is influenced in part by the same factors associated with retention within the province, such as the greater labour market opportunities for Anglophone graduates outside NB (i.e., greater labour market mobility) and more limited opportunities for Francophone teachers in Anglophone provinces across Canada. Previous research (Bhuiyan et al., 2021) also shows that graduates who are from NB are more likely to be retained in NB, with UdeM having a higher proportion of graduates from NB compared to UNB and STU. It is likely the higher retention of NB residents graduating from UdeM and the higher proportion of young Francophone teachers remaining in the teaching profession in NB are correlated.

When we consider all employed teachers across the full age range, it is Francophone teachers who are more likely to exit teaching.

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<sup>4</sup> Anyone born after 1982 and without a BEd from an NB post-secondary institution is assumed to have obtained their BEd from other jurisdictions outside of NB or from a private university in NB.

## Factors Associated With Becoming a Teacher in NB

Table 11 (see Appendix) presents the results of a logistic regression aimed at estimating the factors influencing the likelihood that an NB BEd graduate will enter the teaching profession in NB.

When other factors are held constant, the findings reveal that:

- Female BEd graduates have approximately 1.31 times higher odds than their male counterparts of pursuing teaching careers in NB.
- Graduates with a married marital status have approximately 1.96 higher odds than graduates with a single marital status of working as teachers in NB, indicating greater labour market mobility.
- UdeM graduates exhibit a much higher likelihood, or 4.58 times higher odds, of becoming teachers in NB compared to UNB graduates.

In other words, BEd graduates from UdeM are far more likely to remain in NB and work as teachers than graduates from other universities even after controlling for a range of other factors, including whether they previously resided in NB. This is indicative of UdeM graduates having a much stronger preference for staying and working as a teacher in NB, or limited teaching opportunities outside of NB or both.

## Conclusion

The main objective of this study is to shed light on factors associated with the recruitment, retention and mobility patterns of teachers in New Brunswick (NB) from 2013 to 2020. The analysis was based on a unique longitudinal person-level data set that combined graduation data, teacher payroll data and Medicare registry data, which allowed us to study teachers' transition decisions at the level of the individual.

Our findings indicate that, overall, about 90% of teachers were still in the profession five years after they started teaching, and annual teacher attrition rates (from the active roster) were relatively low, at about 2-3%. This suggests that retention of current teachers has been relatively steady over the past number of years, though even an annual loss of 2-3% of teachers means constant attention to recruitment is necessary.

**Even though retention of current teachers has been relatively steady over the past number of years, an annual loss of loss of 2-3% of teachers means that constant attention to recruitment is necessary.**

It should be emphasized, though, that recent results are not necessarily indicative of future trends, particularly if there are external changes to the education system such as a marked increase in student numbers (as has been evident recently in NB because of rising immigration and migration from other provinces).

We also investigate the rate at which Bachelor of Education (BEd) graduates from NB universities become teachers in the NB public school system. Though this study can only observe graduates from NB public universities, a decreasing trend of BEd graduates can be observed since 2009, with an average of about 250 graduates per calendar year from the public university system.

Not all graduates end up teaching in NB, with about 59% of graduates from NB<sup>5</sup> becoming teachers. The shares of graduates from outside Canada and outside NB (domestic students) who become teachers are substantially lower, at 10% and 11% respectively. This indicates that a substantial proportion of BEd graduates either become teachers elsewhere or enter a different profession (45% to 50% of all BEd graduates are NB teachers). While some graduates, especially those not from New Brunswick, will leave the province regardless, the focus should be on retaining and recruiting more education graduates in the public school system.

**A substantial proportion of BEd graduates from NB public universities do not become teachers in NB, demonstrating the need to focus on retaining and recruiting more NB BEd graduates in the public school system.**

Another way of recruiting more teachers is by recruiting teachers with credentials from other jurisdictions (domestic and international). Even though most new hires are Canadian citizens,

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<sup>5</sup> This is based on previous residence prior to enrolment in a Bachelor of Education program at a public university in NB.

from 2017 onward, around 5% of new teachers in NB are either permanent residents or on work permits, indicating an ongoing effort to recruit teachers with non-Canadian credentials.

## Looking Forward

Additional research could explore more factors associated with teacher recruitment and retention. For example, large scale surveys of former teachers could yield information on dimensions affecting transition decisions not available in administrative data, such as job satisfaction and motivation, supportive school leadership and adequate compensation.

The current report could also be supplemented in a number of ways that use the administrative data that are available. Such future work could include the following:

- **Examining the outcomes of NB BEd graduates who don't join the NB public school system**

This could be accomplished in an additional report utilizing NB-IRDT data and would include both inter- and intra-provincial retention rates of these graduates.

- **Studying the trajectory of BEd graduates from private universities**

The analysis could be carried out by collecting and linking education data sets from private universities (e.g., Crandall University).

- **Analyzing the labour market decisions of teachers with work permits, temporary resident permit holders and permanent residents**

This study could be conducted by linking the NB Teacher Payroll data to the Permanent Resident Data and the Transition Data (i.e., transition to permanent resident) from Immigration, Refugees and Citizenship Canada (held at NB-IRDT).

- **Studying whether NB BEd graduates are living and working elsewhere and/or pursuing higher education during the average 2-3 year gap we find between graduating and entering the teaching profession**

This research could be carried out by analyzing a data set that links the Postsecondary Student Information System (PSIS) and T1 Family File (TIFF) - Income Tax Data, which are currently available through the Statistics Canada Research Data Centres. *Note that it is not currently possible to link Teacher Payroll data to these other data sets.*

- **Studying the income and labour market outcomes of BEd graduates from universities across Canada**

This could also be accomplished using the same linked data set (PSIS and TIFF).

## References

- Barnes, G., Crowe, E., & Schaefer, B. (2007). *The cost of teacher turnover in five school districts: A pilot study*. National Commission on Teaching & America's Future. <https://eric.ed.gov/?id=ED497176>
- Bhuiyan, E.M., Daigle, B., McDonald, T., & Miah, P (2020). College & university graduate retention in New Brunswick: 2010 - 2018. Fredericton, NB: New Brunswick Institute for Research, Data and Training. <https://www.unb.ca/nbirdt/research/publications/college-and-university-graduate-retention-in-new-brunswick-2010--2018.html>
- CTF. (2004). Recruitment and retention of teachers: Why teachers entering the profession remain or leave. *CTF Economic and Member Services Bulletin* (2004-5), 1-20.
- Emery, J.C.H., Wang, L., & Daigle, B. (2019). The impact of official bilingualism on the geographic mobility of New Brunswickers: Evidence from 2001 to 2016. Fredericton, NB: New Brunswick Institute for Research, Data and Training. <https://www.unb.ca/nbirdt/research/publications/the-impact-of-official-bilingualism-on-the-geographic-mobility-of-new-brunswickers.html>
- Government of New Brunswick. (n.d.). Teacher Certification: Education and Early Childhood Development. [https://www2.gnb.ca/content/gnb/en/services/services\\_renderer.599.Teacher\\_Certification.html#serviceDescription](https://www2.gnb.ca/content/gnb/en/services/services_renderer.599.Teacher_Certification.html#serviceDescription)
- Nguyen, Tuan D., Pham, L., Springer, M., & Crouch, M. (2019). *The factors of teacher attrition and retention: An updated and expanded meta-analysis of the literature*. (Working Paper No. 19-149). Annenberg Institute at Brown University. <https://doi.org/10.26300/cdf3-4555>
- Smith, C. (2018, August 29). Teacher Shortage Concerns Raising Alarms in New Brunswick. *Global News*. <https://globalnews.ca/news/4417245/teacher-shortage-concerns-raising-alarms-in-new-brunswick/>

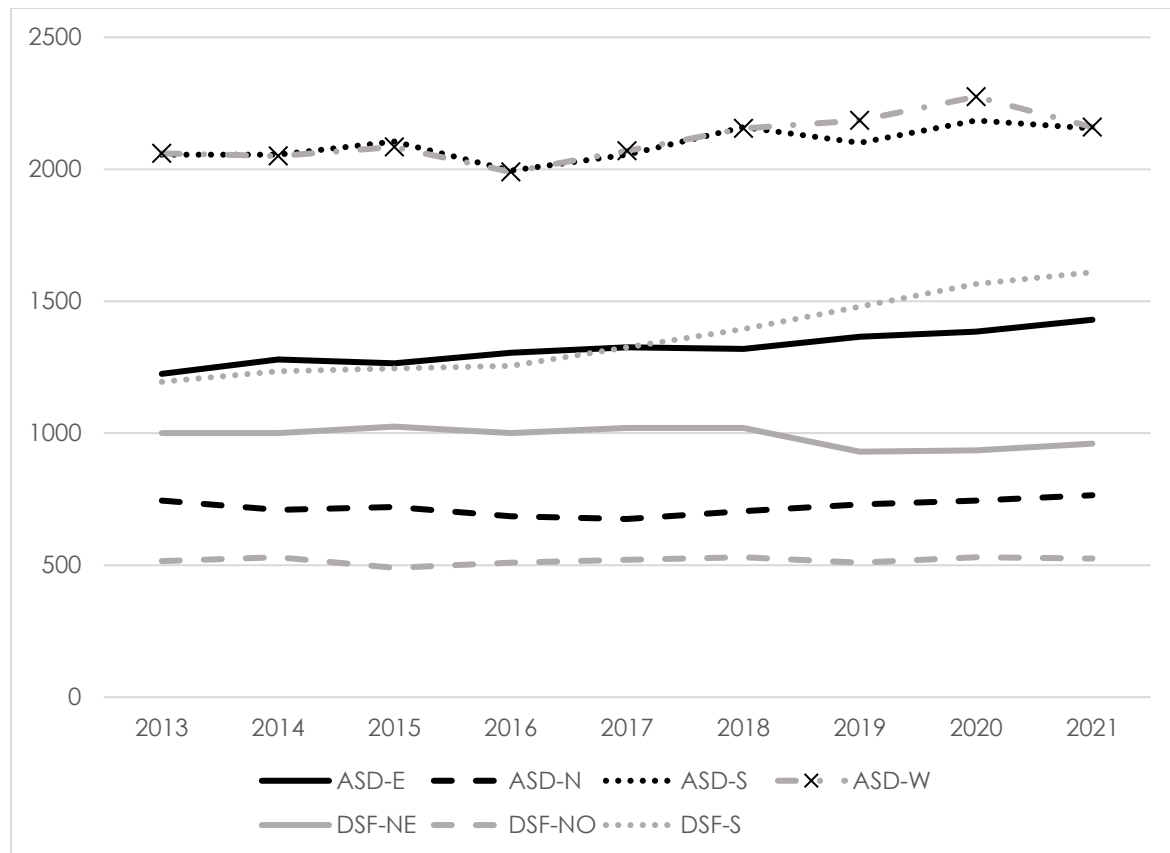
## Appendix 1 – Supplementary Results

**Table 8: Active Roster by Contract Type (Status as of October)**

Contract Type	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Contract B</b>	87.2%	86.2%	85.7%	84.2%	83.2%	83.0%	79.1%	80.6%	84.1%
<b>Contract C</b>	0.2%	0.2%	0.2%	0.1%	0.2%	0.4%	0.3%	0.5%	0.3%
<b>Contract D</b>	10.4%	11.6%	11.4%	12.5%	13.3%	13.4%	12.1%	10.7%	11.8%
<b>Contract E</b>	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%	0.3%	0.4%	0.4%
<b>Other</b>	1.8%	1.7%	2.3%	2.8%	3.0%	2.9%	8.1%	7.9%	3.4%
<b>Total</b>	<b>8825</b>	<b>8870</b>	<b>8955</b>	<b>8770</b>	<b>9025</b>	<b>9360</b>	<b>9370</b>	<b>9680</b>	<b>9649</b>

All counts in this report are randomly rounded to the nearest 5 to protect confidentiality.

**Figure 16: Active Roster by School District (October)**





**Table 9: Factors Associated With Teaching Duration**

<b>Variables</b>	<b>Hazard Ratio</b>	<b>Confidence Interval</b>
<b>Comparison Category: Sector = Anglophone</b>		
Francophone	1.133***	1.039 - 1.235
<b>Comparison Category: Payroll Status = Part-Time</b>		
Full-Time	0.768***	0.639 - 0.922
<b>Comparison Category: Sex = Female</b>		
Male	1.079*	0.988 - 1.179
<b>Comparison Category: Marital Status = Married</b>		
Single	1.313***	1.177 - 1.466
Other	0.920	0.826 - 1.025
<b>Comparison Category: Certification = Certificate 5</b>		
Certificate 4	1.141**	1.028 - 1.267
Certificate 6	0.839***	0.762 - 0.923
Interim	7.831***	6.211 - 9.873
<b>Comparison Category: First Year Teaching = Before 2004</b>		
2004-2006	2.261***	1.882 - 2.715
2007-2009	2.908***	2.416 - 3.500
2010-2012	5.261***	4.365 - 6.342
2013-2015	8.791***	6.693 - 11.55
2016-2018	6.473***	4.516 - 9.279
2019-2021	5.335***	2.510 - 11.34
<b>Age at the Start</b>	1.150***	1.118 - 1.183
<b>Age at the Start (square)</b>	1.000	0.999 - 1.000
<b>Comparison Category: Immigration Status = Canadian Citizen</b>		
Permanent Resident	0.962	0.640 - 1.446
Work Permit	0.921	0.123 - 6.873

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 10: Factors Associated With Teaching Duration With NB BEd (Born >=1982)**

<b>Variables</b>	<b>Hazard Ratio</b>	<b>Confidence Interval</b>
<b>Comparison Category: Sector = Anglophone</b>		
Francophone	0.395***	0.276 - 0.566
<b>Comparison Category: Payroll Status = Part-Time</b>		
Full-Time	0.424***	0.269 - 0.670
<b>Comparison Category: Sex = Female</b>		
Male	1.145	0.815 - 1.610
<b>Comparison Category: Marital Status = Married</b>		
Single	1.807***	1.328 - 2.460
Other	2.222**	1.203 - 4.107
<b>Comparison Category: Certification = Certificate 5</b>		
Certificate 4	4.588***	2.172 - 9.694
Certificate 6	0.435***	0.261 - 0.724
Interim	7.384***	4.529 - 12.04
<b>Comparison Category: Province of BEd = Non-NB</b>		
NB BEd	0.941	0.656 - 1.348
<b>Comparison Category: First Year Teaching = 2010 - 2012</b>		
2004-2006	0.500	0.166 - 1.505
2007-2009	0.581**	0.361 - 0.936
2013-2015	0.974	0.673 - 1.410
2016-2018	0.783	0.479 - 1.280
2019-2021	0.539	0.200 - 1.450
<b>Age at the Start</b>	1.262	0.444 - 3.587
<b>Age at the Start (square)</b>	0.995	0.976 - 1.014
<b>Comparison Category: Immigration Status = Canadian Citizen</b>		
Permanent Resident	0.983	0.303 - 3.186
Work Permit	0.429	0.0561 - 3.283

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 11: Factors Associated With NB BEd Grads Becoming Teachers in NB**

<b>Variables</b>	<b>Odds Ratio</b>	<b>Confidence Interval</b>
<b>Comparison Category: Sex = Female</b>		
Male	0.761***	0.663 – 0.873
<b>Comparison Category: Marital Status = Married</b>		
Single	0.509***	0.448 – 0.579
Other	0.908	0.702 – 1.175
<b>Comparison Category: NB PSE = UNB</b>		
STU	1.638***	1.397 – 1.921
UdeM	4.575***	3.949 – 5.300
<b>Age at the Start</b>	2.205***	2.031 - 2.394
<b>Age at the Start (Square)</b>	0.989***	0.988 - 0.990
<b>Comparison Category: Previous Residence = NB</b>		
Province Outside NB (Domestic)	0.466***	0.374 - 0.581
Outside Canada (International)	0.225***	0.106 - 0.477

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Appendix 2 – Statistical Analysis Methodology

### Factors Associated With Teaching Duration

We estimated duration models in the following form:

$$h(t) = h_0(t) \times \exp (b_1x_1 + b_2x_2 + b_3x_3 \dots b_px_p)$$

where

- $t$  represents time.
- $h(t)$  is the hazard function determined by a set of covariates  $(x_1, x_2, x_3 \dots x_p)$
- The coefficients  $(b_1, b_2, b_3, \dots b_p)$  measure the impact of covariates.
- $h_0$  is the baseline hazard if all the  $x_i$
- $\exp (b_i)$  are hazard ratios.

The Cox Proportional Hazard model enabled us to explore relationships between survival duration and its determinants. It allows for the inclusion of observable factors (referred to as covariates) that may affect the likelihood of exit from the profession and thus the duration spent working as a teacher.

We also ran another duration model by restricting the sample to individuals born after 1982 to account for having a Bachelor of Education from NB universities.<sup>6</sup> The observable factors or covariates include school sector, payroll status, sex, marital status, certification type, first year of teaching, immigration status and age at entry into teaching.

The model estimates the impact of these covariates on teaching duration from position start date until exit from the Teacher Payroll data. Individuals still employed as of the end of the study period (2021) are treated as censored in the analysis.

The estimated hazard rate is the probability of an event (exit from teaching) occurring, conditional on the probability the individual has survived in the teaching profession until that time.

**Hazard ratios greater than 1 indicate risk of exiting is higher, while hazard ratios less than 1 imply lower risk than the base category.**

For analysis, the base categories are Anglophone (school sector), part-time (payroll status), female (sex), married (marital status), Certificate 5 (certification type), first year of teaching before 2004 and Canadian citizen (immigration status).

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<sup>6</sup> Anyone born after 1982 and without a BEd from a public university in NB B can be assumed to have obtained a BEd from other jurisdictions or from a private university in NB.

## Factors Associated With NB BEd Graduates Becoming Teachers in NB

$$\log \frac{P(\text{TeacherNB})}{1-P(\text{TeacherNB})} = \beta_1 \text{Gender}_i + \beta_2 \text{MarStat}_i + \beta_3 \text{Age}_i + \beta_4 \text{PrevRes} + \beta_5 \text{Instit}_i + \varepsilon_i$$

where

$\log \frac{P(\text{TeacherNB})}{1-P(\text{TeacherNB})}$  refers to the probability of becoming a teacher in NB (at any period)

- Sex: equals 0 for male students, 1 for female students and 2 for others.
- *MarStat*: refers to most recent marital status of the teacher (0 for single, 1 for married, 2 for other)
- Age: Age at the at the start of teaching who appeared in payroll or at graduation for those who are not in payroll.
- *PrevRes*: refers to previous residence before enrolling in NB university, 0 for NB, 1 for Province Outside NB(Domestic), 2 for Outside Canada (International).
- *Instit*: refers to university attended for BEd (UNB, UdeM or STU).

Binary logistic regression was used to estimate covariates affecting the probability of an NB BEd graduate becoming a teacher in NB. In the equation above,  $\log \frac{P(x)}{1-P(x)}$  is the probability of an NB BEd graduate becoming a teacher in the public school system in the province.

The regression accounts for covariates, including sex, marital status, age at the start of teaching or graduation (for those not in payroll), previous residence prior to enrolling to an NB university and graduating institution (for a Bachelor of Education).