Addressing the Early Childhood Educators Labour Shortage in Canada: Challenges, Solutions, and Impacts

Alisaleh Shariati
Centre for the Study of Living Standards

CSLS
Centre for the
Study of Living Standards
Centre d'étude des
niveaux de vie

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Abstract

The Canada-wide early learning and child care program may not successfully provide the additional 250,000 child care spaces by 2026 as envisioned in Budget 2021. A key reason for this is the lack of qualified Early Childhood Educators (ECEs) needed to staff these additional spaces. This shortage is partly due to the low wages in this occupation. This report investigates a proposal for an across-the-board 25 per cent wage increase for qualified ECEs. It finds that this proposed wage increase would be sufficient to attract the necessary number of ECEs to support the expansion of the child care system in Canada. However, other considerations such as investment in physical capacity and training for the child care workforce would also be needed for expansion. The report also reviews the social benefits of the expanded child care network. It projects that with the estimated cost of $1.2 billion needed to raise ECE wages by 25 per cent, investment in higher ECE wages would have a benefits-to-cost ratio between 1.88 and 2.06, due to the economic benefits it generates. Lastly, the report discusses the potential long-term effects of this expansion of the child care system on children's development, quality of care, and fertility rates.

Executive Summary

Canada, like other industrialized economies, has taken steps to increase the availability of child care services. The most notable recent initiative is the introduction of the Canada-wide Early Learning and Child Care (CWELCC) framework in 2021 by the federal government. This ambitious five-year program aims to reduce fees to an average of $10 per day for children under the age of six in licensed child care by March 2026 and to create 250,000 new child care spaces. However, despite an allocation of over $30 billion in public investment over five years, the federal child care program is encountering numerous challenges. One of the most significant is the difficulty many child care centres face in attracting and retaining a sufficient number of qualified Early Childhood Educators (ECEs), a situation that was exacerbated by the Covid pandemic. In fact, employment in child care dropped by 21 per cent during the pandemic, compared to 3 per cent among other workers (Uppal and Savage 2021).

The labor shortage in the sector and the expansion of spaces envisioned in the CWELCC program are certainly at odds. To address this problem, child care advocates have been calling for additional funding aimed at enhancing the pay, benefits, and working conditions of ECEs. In particular, the YMCA, the largest not-for-profit child care operator in Canada, has expressed interest in examining a proposal for an across-the-board 25 per cent increase in wages for qualified ECEs. The estimated cost of this wage increase is around $1.2 billion. The Centre for the Study of Living Standards (CSLS) has conducted this report to shed light on the effectiveness of this proposal, and to measure its effectiveness in staffing the intended number of spaces within the CWELCC plans and to analyze its broader economic impacts.

The report begins with a comprehensive overview of the state of the child care sector in Canada, with a particular focus on its workforce. As of 2021, 252,645 individuals were employed in child care, with 207,830 (82.2 per cent) being ECEs and 44,815 (17.8 per cent) home child care providers, together representing 1.2 per cent of the entire labour force. The report highlights a more than 100 per cent increase in the number of quarterly job vacancies for ECEs from the second quarter of 2021 to the second quarter of 2022. It also notes that wages for ECEs have remained stagnant in real terms during this time. Moreover, the median hourly wage for ECEs at $21 per hour is significantly lower than wages for workers in occupations requiring similar levels of education and qualifications, or those in comparable fields of education, such as kindergarten teachers.

The report then applies the estimates from the economic literature on the labour supply elasticity of ECEs and concludes that the proposed wage increase could attract between 58,192 and 103,746 additional ECEs, assuming they work the current average number of hours. This increase would come from attracting new ECEs (new graduates or workers from other sectors), reducing the number of ECEs leaving the sector, and increasing the

work hours of existing ECEs. Even with a conservative child-to-staff ratio of 6, this increase in ECEs' pay would suffice to staff the 250,000 additional spaces. However, the report also notes operational and logistical constraints, particularly the capacity of post-secondary education systems to graduate enough qualified ECEs to support the creation of these spaces. It estimates that it will take at least four years for universities and colleges in Canada to graduate the required number of ECEs for the expansion of the child care spaces.

The report further reviews Quebec's experience with universal child care following the implementation of a low-fee publicly funded system in September 1997, especially its impact on the labour force participation of mothers. Extrapolating from previous studies, the report estimates that if Canada mirrors Quebec's experience, maternal labour force participation could increase by 8.40 percentage points over five years, generating approximately $2.48 billion per year in economic benefits as measured by an increase in Gross Domestic Product (GDP). An alternative estimation method based on the current potential demand for child care services in Canada which accounts for the crowding out of informal care associated with the introduction of universal child care programs, yields an increase in maternal labour force participation of 7.54 percentage points over five years, contributing $2.25 billion per year to the Canadian GDP in that time frame.

Since these economic benefits can only materialize if the regulated child care spaces created are adequately staffed and given the estimated price tag of 1.2 billion dollars to fund the higher ECE wages, the estimated benefit-to-cost ratio is between 1.88 to 2.06. This means that for every dollar spent on increasing the ECE wages, 1.88 to 2.06 dollars worth of economic benefits would be generated for the Canadian economy.

The study concludes with a qualitative assessment of other social benefits attributed to increasing the wages of ECEs and expanding the coverage of the universal low-fee child care system at the national level. It reviews international and Canadian evidence regarding the effects of universal child care programs on children's development, human capital formation, and later life outcomes; quality of care; and fertility and birth rates. The findings suggest that a well-implemented universal child care program can lead to improvements in child development and life outcomes, especially for children from disadvantaged backgrounds. However, without adequate funding and staffing, the efficacy of the child care program could be severely undermined, potentially leading to adverse outcomes for children. Moreover, the study finds that sufficient staffing and improved working conditions for ECEs can enhance the quality of care provided to children. Finally, the review does not find a strong relationship between universally accessible child care spaces and fertility rates.

Summary of Key Assumptions and Results

Assumptions	
ECE Wage Increase	25 per cent
Cost of Funding the Wage Increase	$1.2 billion
Number of Additional Spaces Created	250,000 formal child care spaces at not-for-profit child care centres
ECE Labour Supply Elasticity	1.15 (Conservative) and 2 (Baseline)
Average Number of New ECE Graduates	6,350
Maternal Labour Supply Response Channel	Only the extensive margin (Decision to work)
Child-to-Staff Ratio	6 (Conservative) for children 0 to 5 years old
Child-to-Mother Ratio	1.33 (National fertility rate)
Source of Benefits	Only limited to the expansion of centre-based child care centres
Type of Benefits	Economic benefits (GDP)
Results	
ECE Labour Supply Response	58,192 ECEs(Low estimate) 103,746 ECEs (Baseline estimate)
ECE Retention Response	5,632 ECEs
Years Needed to Train New ECEs	4
Maternal Labour Supply Response	7.54 to 8.40 Percentage Points (Over five years) Annual Average increase of 1.51 to 1.68 pp
Economic Benefits	$2.25 to $2.48 billion per year
Benefit-to-Cost Ratio	1.88 to 2.06

Source: CSLS calculations.

Introduction

Access to quality child care services has been at the forefront of policy discussions in many advanced economies in recent years. This is partly because the availability of Early Childhood Education and Care (ECEC) aids mothers in achieving the work-life balance to better manage their careers and household responsibilities. Beyond supporting the involvement of mothers in the labour market, high-quality ECEC is linked to positive outcomes in child development and learning, crime reduction, enhanced equal opportunities, and diminished poverty. Consequently, ECEC stands as a vital instrument for promoting various objectives in family, child, and gender equality policies.[1]

In Canada, the federal government in its April 2021 budget (Department of Finance, 2021) has committed to a Canada-wide Early Learning and Child Care (CWELCC) system with the participation of various provinces, territories, and Indigenous partners. The stated goal of this initiative is to add 250,000 new child care spaces across Canada by March 2026 and to increase the affordability of child care services by providing them at an average parental fee of $10 per day for each child under the age of six by 2026.[2]

To understand the significance of the proposed reduction in costs, it is worth noting that in early 2022, the mean parental child care expenses were about $31 per day per child for children in a daycare centre, preschool or child care centre (including centre de la petite enfance). This represents a $7,790 expenditure per year for the main full-time (30 or more hours per week) child care arrangement ($9,616 excluding Quebec) for their 0-to-5-year-old children[3] (Statistics Canada, 2023a). Such drastic cost reduction and expansion of the availability of ECEC services is only made possible by considerable increase in federal and provincial governments funding of the ECEC sector. As announced in the 2021 federal budget, the federal government plans to spend $30 billion over five years on early learning and child care. Given this very high price tag, an objective analysis of the broad set of social and economic impacts of this policy proposal is of paramount importance. While all provinces and territories have signed agreements with the federal government to participate in CWELCC, many child care operators, a large portion of them being not-for-profit,[4] have expressed concerns about the program's implementation. Child care advocates specifically worry that the intended increase in the supply of affordable licenced child care services

[2] For more detailed information about the agreements between the federal and provincial governments see: https://www.canada.ca/en/early-learning-child-care-agreement/agreements-provinces-territories.html.
[3] There is a considerable difference in the cost of child care depending on the type of arrangement. For example, in 2022 child care cost for a 0- to 5-year-old child in a full-time child care centre was an average of $31 per day ($7,957 per year), $29 ($7,042 per year) per day for full-time child care in a family child care home, and $106 per day for full-time care by a non-relative in the child's home (Statistics Canada, 2023a).
[4] As of 2023, about 40 per cent of child care centres in Canada were not-for-profit organizations (Statistics Canada, 2022).

cannot be achieved unless compensation levels of ECEs are increased significantly. The YMCA, the largest not-for-profit child care provider in Canada, has advocated for a comprehensive approach aimed at enhancing support for the early childhood educators as an essential step toward meeting the CWELCC goals.[5] Child care activists believe that the considerable waitlists for child care spaces that currently exist call for more investment in infrastructure (i.e. land and buildings needed for creating more spaces) and physical capital (i.e. tools and supplies needed for the operations of the child care centres) as well.

This study takes a narrow focus on one aspect of the ECE workforce support package and answers two specific questions:

1 How does a 25 per cent increase in ECE wages impact recruitment and retention of ECEs?[6]

2 If wages of fully qualified ECEs increased by 25 per cent compared to what they are today, what would be the return on the investment at an economic level?

By addressing these questions, the study contributes to understanding the aspects of the CWELCC rollout that will be crucial in its success. The analysis provided in this report is based on using the findings of the ECEC literature in Canada and globally to provide estimates for the labour supply elasticities (both recruitment and retention) of ECEs in response to the proposed 25 per cent increase in the wages of fully qualified ECEs.

Section 1 provides an overview of the current state of the Canadian child care sector. We review the structure of the child care providers, the characteristics of the ECEs and the characteristics of child care centres in Canada. Section 2 investigates the labour supply elasticities of early child care educators (ECEs) and the factors influencing them. To that aim, we review the literature on the labour supply elasticities of ECEs with respect to wages to find plausible estimates for these elasticities. We then use these elasticities to estimate the increased supply of ECEs in response to a 25 per cent wage increase and discuss the potential sources of this additional supply. Section 3 sheds light on potential social benefits and returns to investment attributable to raising ECE wages. The report restricts attention to the economic benefits of the increase in maternal labour supply that may be attributable to the expansion of child care spaces and provides a qualitative assessment of additional potential benefits to children's development, human capital formation and later life outcomes, improvements in quality of child care and increase in fertility. Section 4 concludes.

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[5] For more details see the report "An Investment that Works for Child Care Expanding the child care workforce nationwide" available at: https://ppforum.ca/publications/an-investment-that-works-for-child-care/

[6] The idea of raising ECE wages by 25 per cent was first explored by Gordan Cleveland in the article titled "How Much Will It Cost To Raise The Wages Of Early Childhood Educators?" available at https://childcarepolicy.net/how-much-will-it-cost-to-raise-the-wages-of-early-childhood-educators/

■ 1 | Overview of the Canadian Child Care Sector

In this section, we portray a broad picture of the ECEC sector that will primarily concentrate on the supply of child care and its defining characteristics in the Canadian context. Special attention will be given to the following:

1 Structure of child care providers (for-profit versus not-for-profit, size distribution of centres, regional differences.)

2 Characteristics of ECEs including gender composition, age, educational and professional qualifications, years of experience, full-time versus part-time and average weekly hours.

3 Characteristics of ECE workplaces such as wages and non-wage benefits, types of centres (unionized versus non-unionized, subsidized versus non-subsidized, ratio of children to ECEs, job vacancies, length of wait lists for spaces, retention rates and physical capacity to increase the number of child care spots or spaces).

For added clarity and to distinguish between the ECE occupation and the ECEC sector, we briefly discuss some definitions here.

In this report, ECE represents NOC (National Occupation Category) code 42202 "Early childhood educators and assistants". As such, both educators and assistants are referred to as ECE. Home child care providers (NOC 44100) is a separate category and refers to those who provide care primarily in their own homes or in the children's homes, where they may also reside. They are employed by private households and child care agencies, or they may be self-employed.

The ECEC sector corresponds to NAICS (North American Industry Classification System) 2017 code 624410 "Child day-care services" and excludes those providing babysitting or nanny services (included in NAICS code 814110 "Private households") and those providing kindergarten education (included in NAICS code 611110 Elementary and secondary schools).

In addition, we will refer to "Family child care home" and other similar names for family-run child care in a home setting (which can be regulated or unregulated) as "Home-based care". To distinguish this arrangement from the care provided by a child care provider at the child's home (e.g. child care by a nanny) we will use the term "At-home care". Home child care providers (NOC 44100) includes both home-based care and at-home care providers.

1.1 | Structure of Child Care Providers

In this subsection, we first take a close look at the different types of child care providers and provide a detailed breakdown of the types of child care centres and home-based centres that serve children between 0-to-5-years old in Canada. We then focus on the distribution of centres across provinces. Finally, we highlight some of the main characteristics of child care centres in Canada. In Appendix C, we provide a historical perspective on the evolution of child care spaces at child care centres and regulated home-based centres as well as the share of for-profit spaces at the provincial level.

Chart 1: Type of Child Care Arrangement in Canada, Excluding Parental Care,
Per cent of Total Children Aged 0 to 5 years, 2019 and 2023
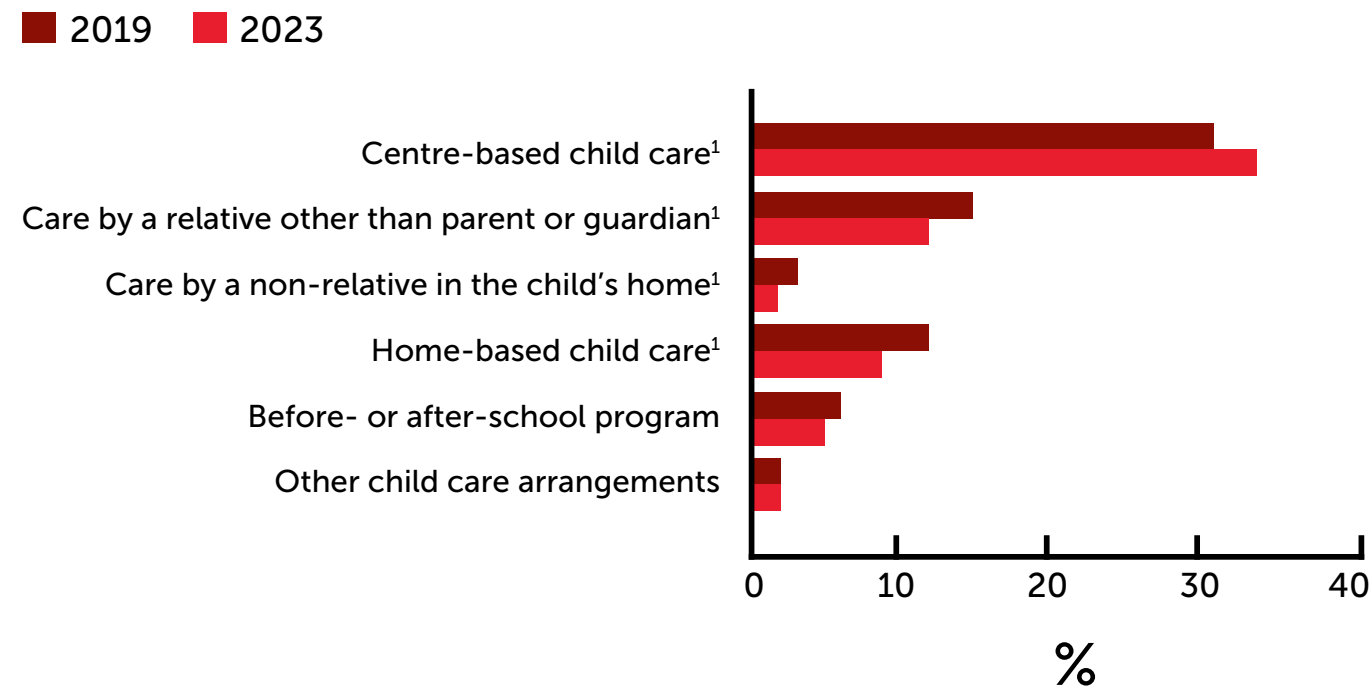
Note: [1] represents a significant change from 2019 to 2023. The Shares do not add up to 100 per cent as children that are taken care of by their parents are excluded.
Source: Statistics Canada- Table 42-10-0031-01

According to Statistics Canada data[7] 34.3 per cent of children between the ages of 0 and 5 were enrolled in centre-based child care spaces in 2023, making this the most common type of child care arrangement for young children in Canada (excluding the care provided by parents). As Chart 1 illustrates, other popular forms of child care arrangements include care by relatives other than a parent or guardian (11.7 per cent) and home-based child care (9 per cent). The interesting pattern that one can observe is the decline in all care arrangements except for centre-based child care between 2019 and 2023. In fact, the number of children enrolled in child care centres has risen by 3.3 percentage points, while care by a non-relative in the child's home and home-based care have fallen by 0.9 and 3.2 percentage points, respectively.

A recent report by Charters and Findlay (2023), using the Canadian Survey on the Provision of Child Care Services (CSPCCS), the first Canada-wide survey that describes the provision of child care services in detail, has found that child care centres made up only about 31 per cent of the total of 45,366 businesses providing child care to children aged 0 to 5 years old in the country. Around 33 per cent of the businesses were home-based settings operating with a licence and the remaining 36 per cent were ones without a licence. Focusing on centre-based child care and using CSPCCS, the results obtained by Charters and Findlay (2023) indicate that there were 12,664 regulated child care centres (formal) across Canada providing care to children aged 0 to 5 years as of April 2022. Additionally, almost half of the child care centres were not-for-profit or publicly operated. In this context, public child care centres include those operated by a government body, such as a municipality or school board, and private child care includes not-for-profit, charitable, or cooperative types of organizations and for-profit service providers. Figure 1 illustrates the breakdown of child care businesses by type. As of 2022, there were about 6,306 not-for-profit and government-operated child care centres in Canada. Nearly 91 per cent of these centres were licenced.[8]

Studies such as Cleveland et al. (2007), Huntsman (2008) and Doherty et al. (2002) have found that not-for-profit centres tend to put more emphasis on hiring more qualified staff, reducing turnover and increasing job satisfaction and professional development opportunities for their staff.

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[7] Statistics Canada. Table 42-10-0031-01 Type of child care arrangement, children aged 0 to 5 years.
[8] 1.8 per cent were unlicensed and 7.6 gave "not sure" as a response (Source: Statistics Canada, Canadian Survey on the Provision of Child Care Services, 2022)

Figure 1: Child Care Businesses in Canada by Type, 2022
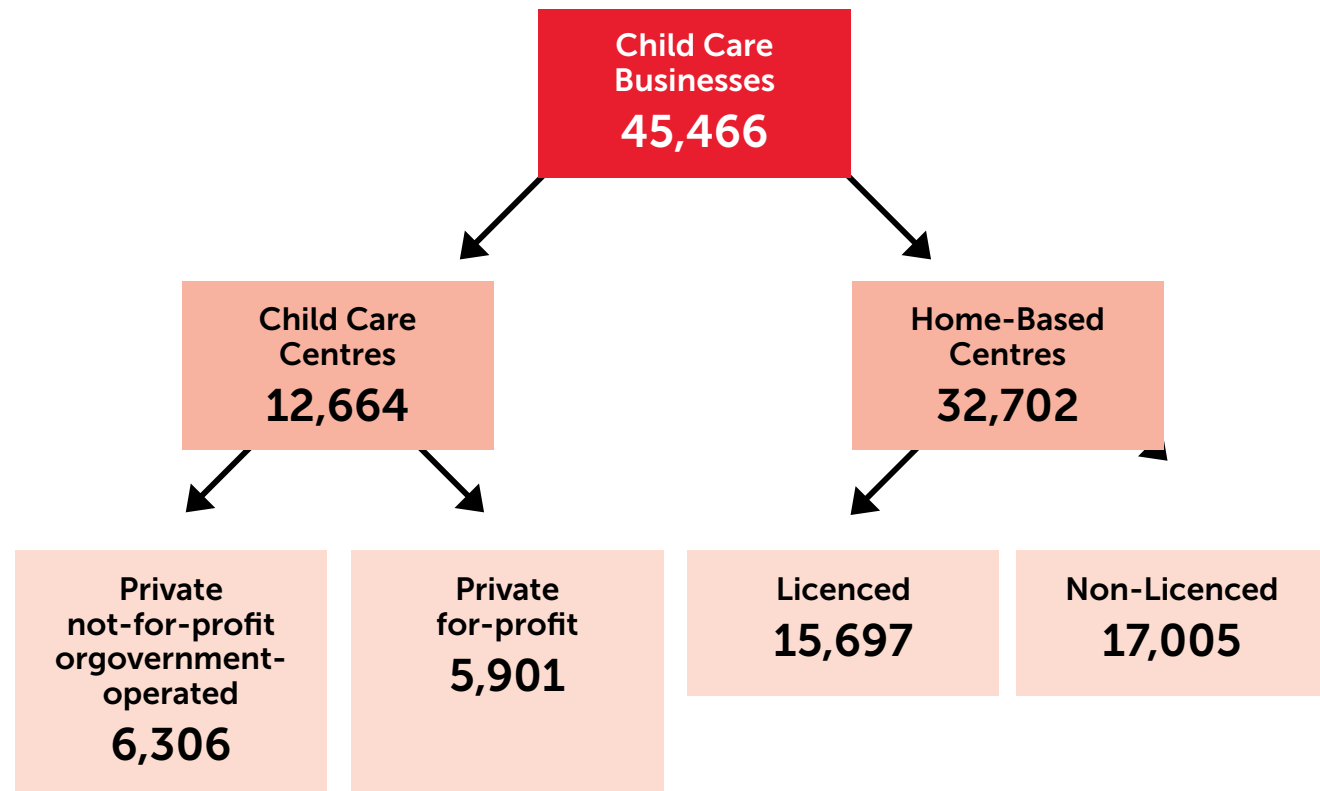
Note: The number of sub-categories for child care centres (Private not-for-profit vs. Private for-profit) and home-based centres (Licenced vs. Non-Licenced) does not add up to the total number of child care centres and home-based centres. The reason is that some centres gave "Don't know" or "Not sure" as an answer to the type of business arrangement they had.
Source: Data provided in Charters and Findlay (Parent Source: Statistics Canada, Canadian Survey on the Provision of Child Care Services, 2022)

Chart 2 provides the distribution of the child care centres at the provincial level in 2022. Unsurprisingly, most of these centres are in the provinces with the largest number of children, namely, Ontario and Quebec.[9]

Table 1 provides the breakdown of regulated child care centres in terms of children's age categories they serve, their licensing status, services provided and the average (mean) number of children in full-time and part-time centres. About 90 per cent of these centres

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[9] 831,185 children aged 0 to 5 in Ontario and 515,725 in Quebec. (Source: Statistics Canada. Table 42-10-0012-01 Number of children in Canada).

offered full-time care, two in three offered part-time care, and one in three offered before- or after-school care. Only 16 per cent of centres offered drop-in or flexible care and a mere 2 per cent provided care during evenings, on weekends or overnight.

Centres that offered full-time care enrolled, on average, 51 children on a full-time basis and centres offering part-time services enrolled 21 children on a part-time basis. 43 per cent (less than half) of centres accommodated at least one child with a disability and 85 per cent served at least one child who was benefiting from a fee subsidy. Within centres that offered full-time care, daily fees (including subsidies) in Canada excluding Quebec were highest for infants ($52.10) and lowest for school-aged children who would typically enroll in before-and-after school programs ($30.80).[10]

Chart 2: The Regional Distribution of Child Care Centres, April 2022
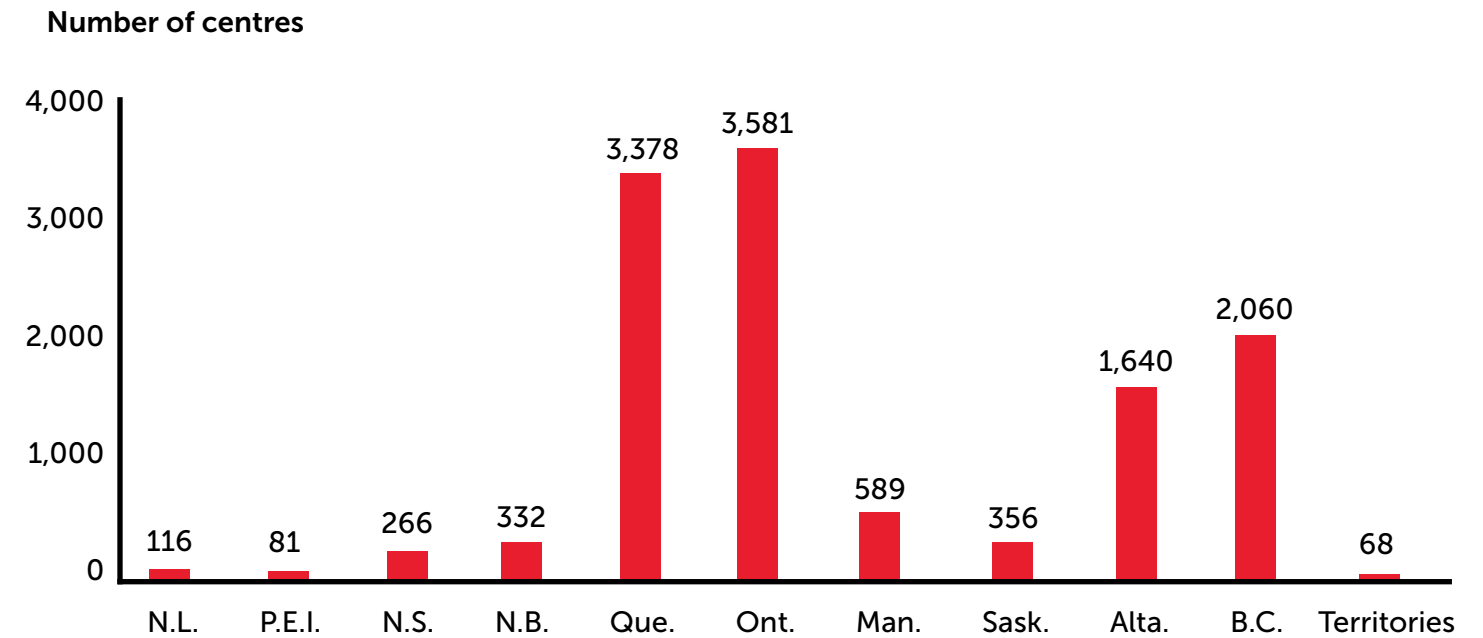
Source: Charters and Findlay (2023)-Chart 1 (Parent source: Statistics Canada, the Canadian Survey on the Provision of Child Care Services)

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[10] Infants are considered children younger than 1, toddlers between 1 to 3 and preschool children are 3 to 5 years old.

1.2 | Characteristics of the Early Childhood Educators (ECEs)

According to the 2021 Canadian Census of Population, of the 252,645 individuals employed in the child care, 207,830 (or 82.2 per cent) were early childhood educators and assistants and 44,815 (or 17.8 per cent) were home child care providers. As of 2021, child care sector represented 1.2 per cent of the entire labour force. Table 2 depicts the number of persons employed in the child care sector within each province and the breakdown for ECEs and home child care providers. The absolute and relative number (to other provinces) of the ECEs in Quebec stands out. In fact, Quebec had the highest *number* of persons employed in child care overall and hired the highest number of ECEs. Notably, 95 per cent of all child care workers in Quebec were ECEs.

Chart 3 illustrates the relative share of child care workforce to the total employed population, by province or territory, as of 2021. In this regard, Quebec has the largest *share* of persons employed in child care relative to total employment, most of which are ECEs. Highly populated provinces such as Ontario and British Columbia have lower shares of child care-to-total employment ratios compared to provinces with smaller populations.

Table 1: Characteristics of Child Care Centres Serving Children Aged 0 to 5 years in Canada, April 2022

Count (Canada)	12,466
	Per cent of Centres
Centre Characteristics	
Provides Care to Groups in Age Categories (proportion)	
Infants (alternative: no infants enrolled)	54.1
Toddlers (alternative: no toddlers enrolled)	72.5
Preschool-aged children (alternative: no preschool-aged children enrolled)	91.4
School-aged children (alternative: no school-aged children enrolled)	39.3
Licensed by Child care Authorities (proportion)	
Licensed	90.6
Not licensed	1.8E
Not sure	7.6
Auspice (proportion)	
Private not-for-profit or government-operated	49.8
Private for-profit	46.6
Don't know	3.6

Services Provided	
Options offered at centre (proportion)	
Full-time (alt: does not offer this option)	87.8
Part-time (alt: does not offer this option)	66.2
Before-or-after school (alt: does not offer this option)	36.8
Evenings, weekends or overnight (alt: does not offer this option)	1.7
Drop-in or flexible (alt: does not offer this option)	15.8
Centre Offers Part-time Care Only (proportion)	
Part-time only	10
Other options offered	90
Enrolment	
Number of Children Enrolled in Centre Full-time (mean)	
All age groups	51.4
Number of Children Enrolled in Centre Part-time (mean)	
All age groups	20.6
Children Enrolled with Disability (proportion)	
Any enrolment	43.4
No enrolment	56.6
Children Enrolled with Fee Subsidy (proportion)	
Any enrolment	85.2
No enrolment	12.9
Don't know	1.9E
Average Full-time Daily fee ($) Charged per child (mean)	
Infants	52.1
Toddlers	51
Preschool-aged children	43.7
School-aged children	30.8

Note: E represents use with caution. Number of children enrolled in centre full-time and part-time represent means in centres with non-zero counts for children enrolled on a given full- or part-time basis. Average daily fees are calculated only in centres offering the full-time child care option. Excluding Quebec. All other care options may include full-time care only, full- and part-time care, and other care options not including part- or full-time care. Average full-time daily fee ($) charged per child Excludes Quebec from the sample. Source: Charters and Findlay (2023)- Table 1

*Table 2: The Distribution of Persons Employed in the Child Care Sector, by Province or Territory, 2021*

Region	All Persons Employed in Child care	Early childhood educators and assistants (ECEs)	Home Child Care Providers	Total Employed Population
Canada	252,645	207,830	44,815	18,613,000
Newfoundland and Labrador	2,255	1,800	455	219,800
Prince Edward Island	1,155	965	190	79,200
Nova Scotia	5,100	4,205	895	448,200
New Brunswick	5,090	4,215	875	364,000
Quebec	92,135	87,585	4,550	4,227,200
Ontario	77,990	59,535	18,455	7,190,000
Manitoba	8,950	7,480	1,470	654,000
Saskatchewan	7,140	5,060	2,080	562,000
Alberta	24,815	15,870	8,945	2,236,000
British Columbia	27,200	20,445	6,755	2,634,000
Yukon	330	305	25	22,100
Northwest Territories	290	215	75	23,500
Nunavut	195	155	40	12,600

Sources: Early Learning and Child Care Information Hub: Statistics Canada, Statistics Canada. Table 14-10-0292-01 Labour force characteristics by territory, three-month moving average, seasonally adjusted and unadjusted, last 5 months, and Statistics Canada. Table 14-10-0287-03 Labour force characteristics by province, monthly, seasonally adjusted.

As Uppal and Savage (2021) report, in 2016, the child care workforce consisting of ECEs, and home child care providers were among the top five of all occupations with the highest proportion of women, each at 96 per cent. The high proportion of women employed in the child care sector has changed little since 1991, when 96 per cent of early childhood educators and assistants and 97 per cent of home child care providers were women.

In addition, ECEs and home providers are both more likely to be younger than workers in other sectors. As Table 3 suggests, as of 2016, 64 per cent were in the 15 to 44 age category. This is almost 9 percentage points higher than the comparable statistics belonging to workers in other sectors (55 per cent) in the same age group.

Chart 3: Relative Share of Persons Employed in Child Care to the Total Employed Population, 2021
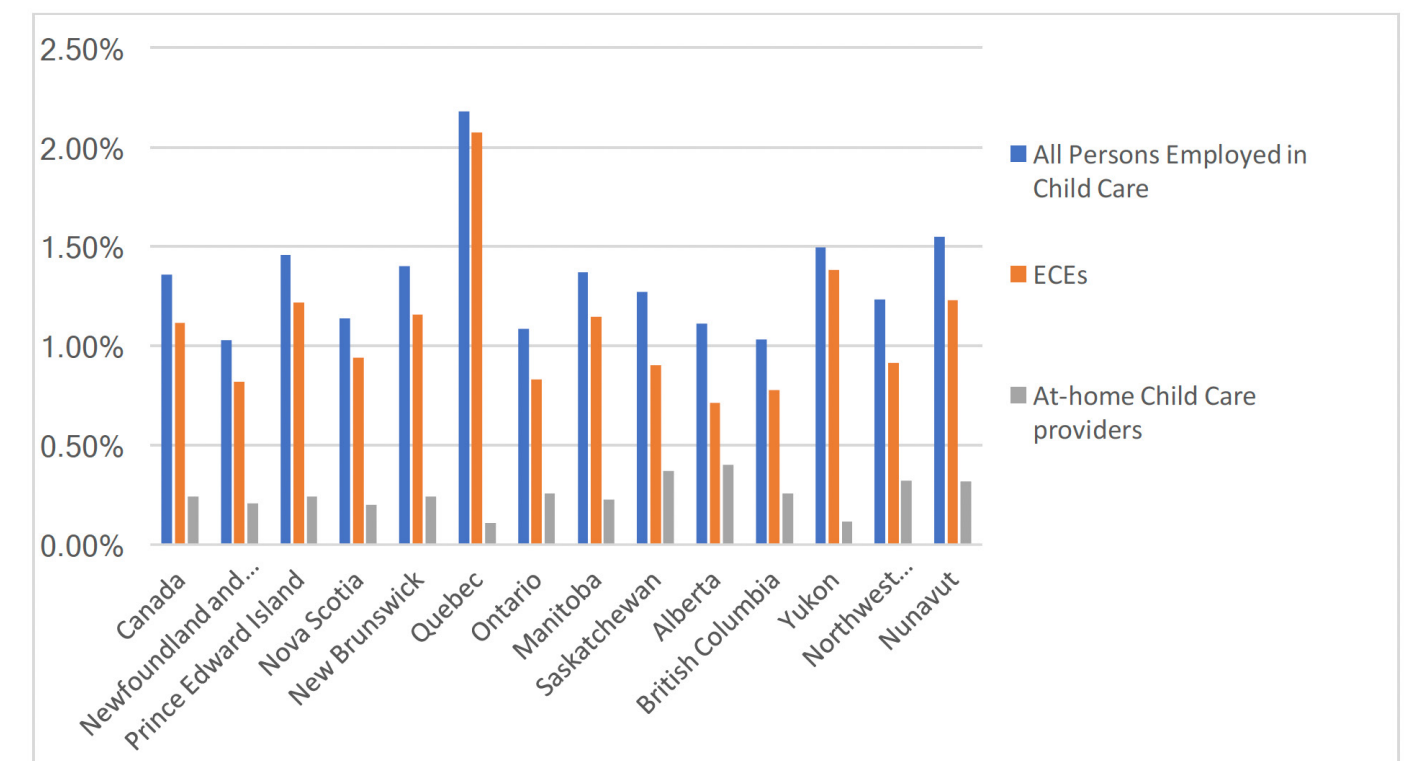
Source: Table 2

Almost 71 percent of the child care workforce had postsecondary education in 2016, with 79 per cent of ECEs having education attainment levels above a high school diploma relative to the 53 per cent of home child care providers. Uppal and Savage (2021) mention that there has been a significant rise in the proportion of persons employed in the child care sector with a postsecondary education between 1991 and 2016 (from 41 per cent to 71 per cent).

The minimum educational requirements needed to qualify as a child care educator have changed in recent decades. While there are no educational requirements for home child care providers, ECEs employed in regulated child care centres are subject to such requirements that vary by province. In Appendix C, Table 1C, we provide the details of these educational requirements for each province. Many provinces require a one-year or two-year college diploma or certificate for ECE qualifications at the individual (educator and staff) levels, with some also regulating the qualifications and composition of educators at the program level.

For instance, in Ontario child care centres, one-third of the staff with an infant group or a toddler group are required to possess a two-year early childhood education (ECE) diploma and two-thirds of staff with a preschool-age group must have a two-year ECE diploma.

Uppal and Savage (2021) report that in 2016, 77 per cent of ECEs in Quebec and 84 per cent in Ontario had a postsecondary education. The province with the highest proportion of early childhood educators and assistants with a postsecondary education was Prince Edward Island, at 86 per cent.

As data in Table 3 illustrates immigrants and visible minorities are more likely to be ECEs and home child care providers than be employed in other sectors. The same could be said about Indigenous persons whose share of the ECE workforce is 4.9 per cent while their share of the overall workforce is about 4.1 per cent. Child care staff are also more likely to have children (especially children older than six) compared to workers in other sectors.

Table 3: The Distribution of Persons Employed in Child Care, by Province or Territory, 2016

Characteristic	Early childhood educators and assistants	Home child care providers	Total, child care workers	All other workers
Sex	Per cent			
Women	96.4	96	96.3	47.4
Men	3.6	4	3.7	52.6
Age	years			
Median age	39.4	41	39.9	42.7
Age group	Per cent			
15 to 24 years	12.3	11.9	12.2	12.7
25 to 34 years	25.7	21.4	24.4	20.9
35 to 44 years	27.3	26.3	27	21.3
45 to 54 years	21.9	20.1	21.3	23.4
55 to 64 years	11.3	15.2	12.5	17.2
65 years and older	1.6	5.1	2.7	4.5

Highest certificate, diploma or degree	years			
No certificate, diploma or degree	5.4	13.8	8	10.1
Secondary (high) school diploma or equivalency certificate	15.6	33.2	21	25.4
Apprenticeship or trades certificate or diploma	7.7	5.7	7.1	10.6
College, CEGEP or other non-university certificate or diploma	47.3	23.4	40	22.2
University certificate or diploma below bachelor level	5	4.2	4.7	3
University certificate, diploma or degree at bachelor level or above	19	19.7	19.2	28.7
Immigrant status	Per cent			
Non-immigrant	72.4	55.9	67.3	74.9
Immigrant	26.6	33.4	28.7	23.8
Non-permanent resident	1	10.7	4	1.3
Presence of children	Per cent			
No children	41.3	52.9	44.9	56.6
Youngest child is younger than 2 years	7	5.1	6.4	5.5
Youngest child is 2 to 5 years	12.5	10.6	11.9	8
Youngest child is 6 to 14 years	21.6	16.1	19.9	13.9
Youngest child is 15 to 24 years	14.6	11.2	13.6	12.5
Youngest child is 25 years or older	2.9	3.9	3.3	3.4
Visible minority	Per cent			
Total visible minority population	23.7	39	28.4	21.2
South Asian	5.2	4.9	5.1	5.4
Chinese	2.4	2.9	2.5	4.3
Black	4.8	3.1	4.3	3.1
Filipino	2.1	21.1	7.9	2.6
Latin American	2.5	2.2	2.4	1.4
Arab	3.7	1.2	2.9	1.1
Southeast Asian	0.4	1.3	0.7	0.9
West Asian	1	0.7	0.9	0.7
Korean	0.7	0.2	0.5	0.5
Japanese	0.2	0.3	0.2	0.3
Visible minority, n.i.e	0.5	0.4	0.4	0.4
Multiple visible minorities	0.4	0.7	0.5	0.6
Not a visible minority	76.3	61	71.6	78.8
Indigenous status	Per cent			
Total Indigenous	4.9	4.5	4.8	4.1
First Nations	3.0	2.3	2.7	2.1
Metis	1.5	1.5	1.6	1.7
Inuit	0.4	0.3	0.3	0.2
Other or multiple indigenous status	0.1	0.1	0.1	0.1

Switching to the economic landscape of the ECE workforce, and using the estimates provided by Statistics Canada (2022a), Table 4 showcases the economic characteristics of ECEC workforce. The economic characteristics are class of worker, full-time work status and employment income.

The class of worker represents paid employee vs self-employed status during the census reference week. Full-time work status identifies whether a person worked mostly full time (30 hours or more per week) or part time (less than 30 hours per week) during the reference week.

Table 4: Economic Characteristics of Persons Employed in the Early Learning Child Care Sector, in 2016

Characteristics	Total, Child care workers	Early childhood educators and assistants	Home Child care providers	Other workers
Class of worker	Per cent			
Paid employee	78.2	84.8	63.5	87.9
Self-employed	21.8	15.2	36.5	12.2
Weekly work hours				
Full-time (>30 hours)	73.3	74.2	71.3	78.5
Part-time (<30 hours)	26.7	25.8	28.7	21.5
Employment income in 2015				
< $20,000	47.8	38.2	69.2	28.6
$20,000-$39,999	39.3	44.9	26.7	22.2
$40,000-$59,999	10.9	14.4	3.1	18.9
$60,000 or more	2.1	2.6	1	30.3
Member of low-income family	12.2	7.8	22	7.9

Note: All results weighted with census sample weights.
Source: Statistics Canada (2022b)- Table 2 (Parent Source: Census of Population, 2016)

Employment income captures wages and salaries for paid employees and reported net income for the unincorporated self-employed as of 2015. Lastly, the ECEs poverty rate was determined based on whether the person was a member of a low-income family according to the Market Basket Measure.

The ECE workforce was less likely to be a paid employee, compared to workers in other sectors. They were also more likely to have an annual income lower than $60,000 per year.

ECEs and especially home child care providers were relatively more self-employed and worked fewer hours (as measured by the ratio of full-time and part-time workers) relative to non-child care workers. Home child care providers were much more over-represented in lower pay scales

(less than $20,000 in annual income) and more likely to be a member of a low-income family than both ECEs and non-child care workers.

Table 5 sheds light on the employment and earnings situation of the ECEs and home care providers relative to other workers.

In 2015, across Canada, ECEs annual mean employment income was less than half of the mean of all other workers ($26,800 vs. $53,800 on an annual basis). Within the child care sector, the earnings of home child care providers ($17,300) were notably lower than those of ECEs ($26,800). In terms of variation among provinces, the territories had the highest earnings to the ECEs, and the lowest average earnings belonged to Atlantic Canada.

Chart 4 provides a relative comparison of job tenure, defined as the number of consecutive months that a person has worked in their current job, between the educators and child care providers and the workers in other sectors from 1997 to 2019.

Table 5: Average Employment Income among Persons Employed in the Child Care Sector and all other workers, 2015

Region	All child care workers	Early childhood educators	Home child care providers	All other workers	Ratio of average child care employment income to all other occupations
	dollars				per cent
Canada	24,100	26,800	17,300	53,800	44.8
Atlantic	19,800	23,000	13,800	47,600	41.6
Quebec	25,400	26,200	17,900	47,100	53.9
Ontario	24,600	28,500	17,100	55,500	44.3
Manitoba	22,900	25,500	16,500	48,900	46.8
Saskatchewan	21,000	24,800	16,300	54,300	38.7
Alberta	23,400	27,800	19,100	67,400	34.7
British Columbia	22,000	25,200	16,900	51,400	42.8
Territories	29,400	32,600	20,800	69,200	42.5

Note: This table includes only those who worked in 2015 with an employment income greater than zero.
Source: Uppal and Savage (2021)- Table 3 (Parent Source: Census of Population, 2016)

Notice that this chart includes both ECEs and home child care providers. There has been a narrowing gap in terms of job tenure between child care providers (ECES and home care providers) and the rest of the workforce. The former group increased its average tenure from 44 months in 1997 to 84 months in 2019 while the latter group had a relatively stable average at around 100 months. This considerable increase in the tenure of child care educators and home child care providers is an interesting observation and could be due to a multitude of factors including the universal child care program introduced in Quebec in 1997 which caused an increase in demand for full-time employees in the sector (especially for ECEs).

Chart 4: Average Number of Months in Current Job, 1997-2019
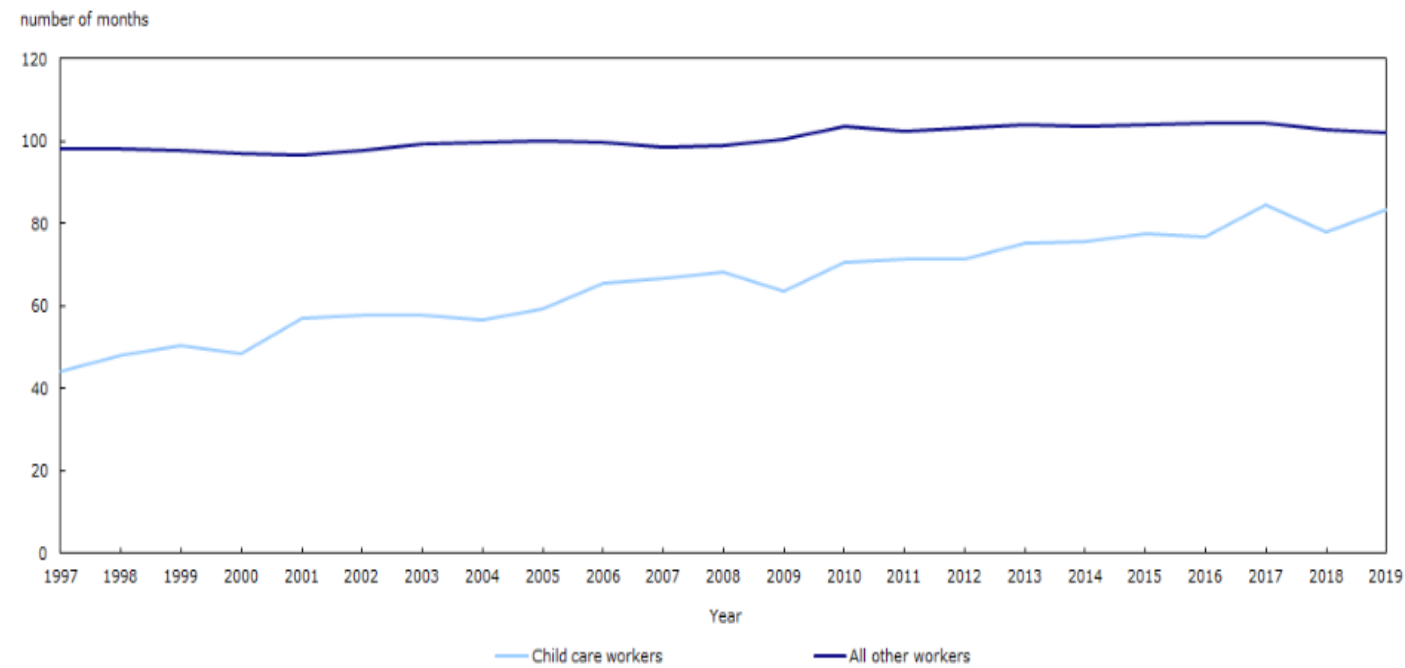
Note: "Child care workers" refers to both Educators and home child care providers (Home-based child care and at-home child care)
Source: Uppal and Savage (2021)- Chart 5 (Parent source: Labour Force Survey, 1997 to 2019)

1.3 | Characteristics of ECE Workplaces

We now turn to describing some of the main characteristics of ECE workplaces in Canada. Table 6 provides the staff, qualifications and pay details at the centre level across Canada in April 2022. On average, child care centres had 9.7 employees providing direct care on a full-time basis and an average of 3.1 employees providing part-time care. About 52 per cent of all centres hired at least two thirds of their staff from qualified ECE and 87.8 per cent either exceeded or met provincial and territorial requirements for ECE staff. The hourly rate paid to supervisory staff was at $27.8 per hour and for qualified ECEs with training it was at $21.9 per hour.

In terms of training at the centre level, Table 7 depicts a more detailed picture. 80.3 per cent of all child care centres in Canada had at least one full-time ECE staff providing direct care to children and 71.3 per cent had at least one supervisory staff with ECE qualifications.

Chart 5 examines the vacancies posted by firms to hire ECEs. The chart illustrates a considerable uptick in the number of vacancies posted after the COVID-19 pandemic (between Q2 2021 to Q2 2022). This sudden increase in vacancies is indicative of the shortages of ECE labour

supply that occurred post-pandemic. This is further supported by the evidence presented in Chart 6. While the average offered wage for the ECEs did experience an upward trend after the pandemic (especially for full-time ECEs), the relative increase (in percentage terms) is not as significant as the increase in vacancies. Simply put, while child care centres needed to hire more ECEs, they were not able or willing to raise the offered wage to attract enough educators. In fact, as Table 8 suggests, in the aftermath of the COVID-19 pandemic, 62 per cent of child care centres reported difficulty hiring and retaining qualified ECEs (the second most significant source of difficulty for child care centres).

Table 6: Staff, Qualifications and Pay Characteristics of Child Care Centres' Employees, Canada, April 2022

Staff, Qualifications and Pay	
Average number of employees providing direct care to children full-time per centre	
All age groups	9.7
Average number of employees providing direct care to children part-time per centre	
All age groups	3.1
Education and training profile of full-time staff (proportion %)	
Fewer than one-third of staff with ECE certificate, diploma or degree	15.8
One-third to two-thirds of staff with ECE certificate, diploma or degree	32.1
Over two-thirds of staff with ECE certificate, diploma or degree	52.0
Current staffing situation (proportion %)	
Exceeds provincial or territorial requirements for ECE staff	40.0
Meets provincial or territorial requirements for ECE staff	47.8
Has permission to operate with fewer than required ECE staff	6.2
Reduced enrollment because of an inability to hire ECE staff	6
Mean Hourly rate ($)	
Supervisory staff	27.8
Employees with ECE training	21.9
Employees with no ECE training	18

Source: Charters and Findlay (2023)- Table 1 (Parent Source: Statistics Canada, Canadian Survey on the Provision of Child Care Services, 2022.)

Table 7: ECE Training among Centre-based Child Care Providers, 2022

| Child care business statistics	per cent (%)
At least one supervisory staff with ECE 4 year degree or graduate training	16.5
At least one supervisory staff with ECE 1, 2, or 3 year certifciate or diploma from a post-secondary institution	71.3
At least one supervisory staff with ECE course or workshop less than 1 year	8.3
At least one full time staff providing direct care to children with ECE 4 year degree or graduate training	14
At least one full time staff providing direct care to children with ECE 1, 2, or 3 year certfcate or diploma from a post-secondary institution	80.3
At least one full time staff providing direct care to children with ECE course or workshop less than 1 year	31.9
At least one full time staff providing direct care to children with ECE 4 year degree or graduate training	4.5
At least one part time staff providing direct care to children with ECE 1, 2, or 3 year certificate or diploma from a post-secondary institution	40.9
At least one part time staff providing direct care to children with ECE course or workshp less than 1 year	25.4

Source: Early Learning and Child Care Information Hub: Statistics Canada https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021007-eng.htm

Table 8: Negative Impacts on Centre-based Child care Services due to COVID-19 in the Previous Year, Canada, April 2022

Negative impact	Response	
	Yes	No
	Per cent	
Lower enrolment or fewer children	61.3	38.7
Difficulty recruiting and retaining skilled child care employees	62	38
Loss of employees because of COVID-19-related health concerns	45.1	54.9
Lost or reduced government funding	18.1	81.9
Deferred rent on business space	6.4	93.6
Costs associated specifically with COVID-19 health and safety requirements	67.7	32.3
Difficulty maintaining government regulations associated with COVID-19 health and safety requirements	32.9	67.1
Temporary shutdown of business	42.3	57.7
Previous or ongoing loss of revenue	37.4	62.6
Other	4.6	95.4

Source: Chartes and Findlay (2023)-Table 2

Chart 5: Total Number of Job Vacancies Posted for Hiring ECEs, 2015- 2023
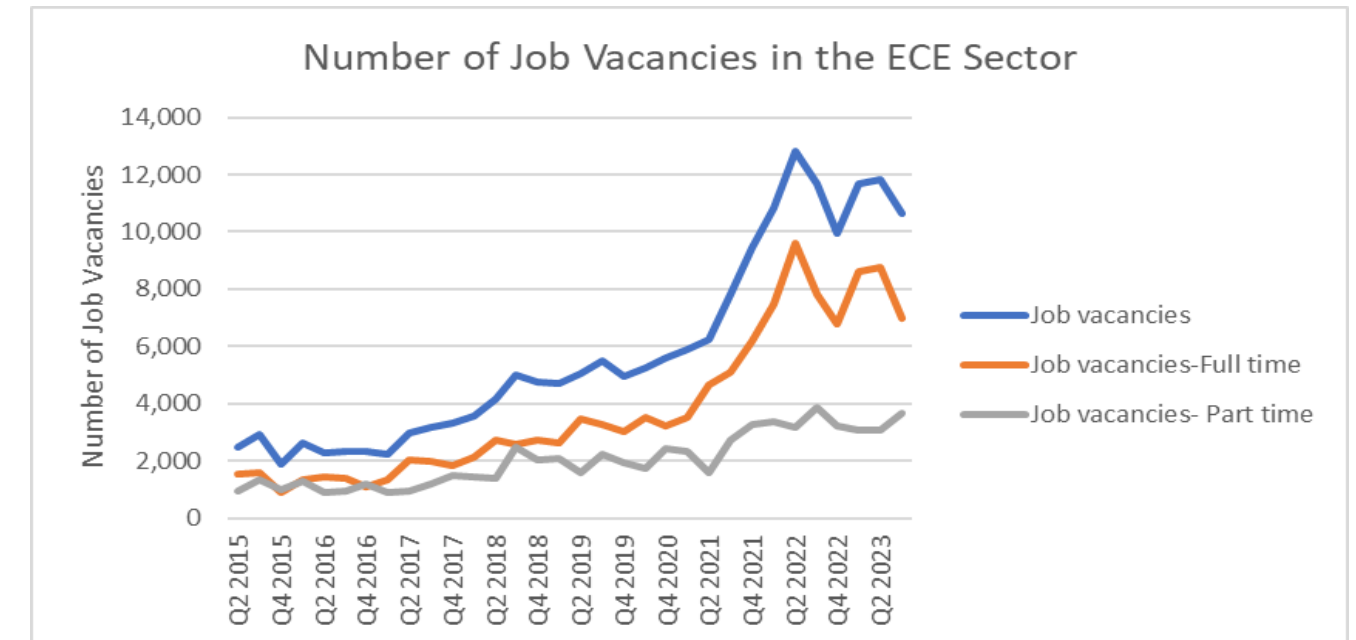
Number of Job Vacancies in the ECE Sector

Note: The data are not seasonally adjusted.
Source: Statistics Canada, Table: 14-10-0328-01

Chart 6: Average Quarterly Offered Wage for ECEs, 2015-2023
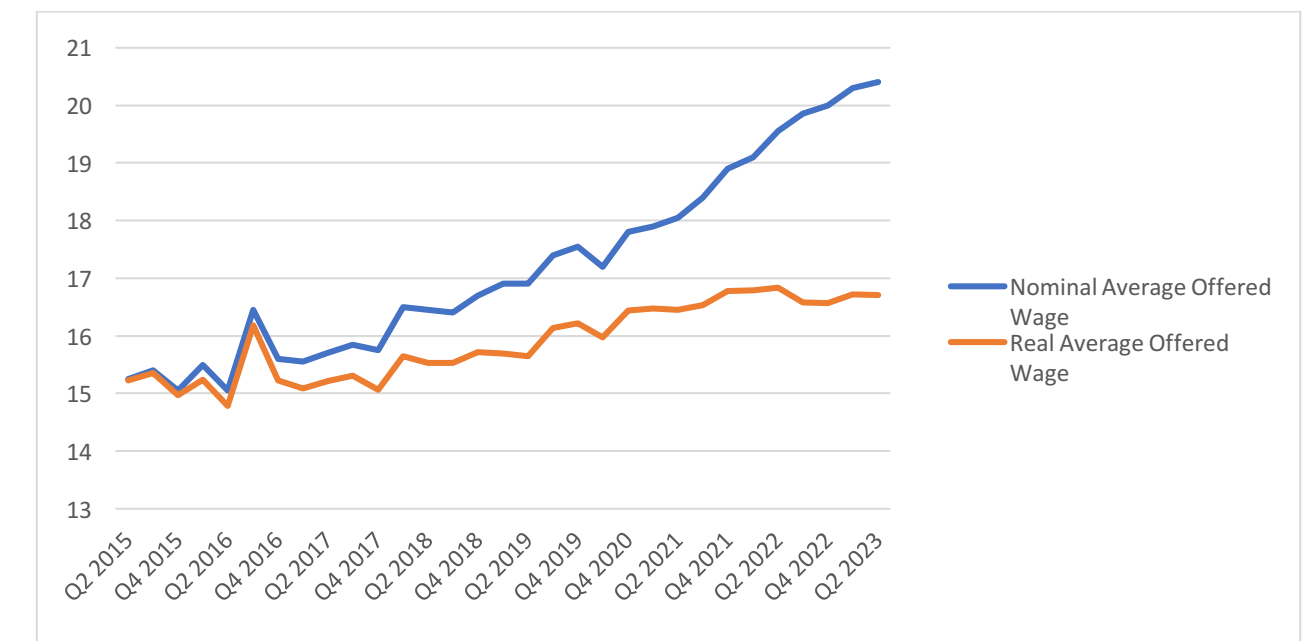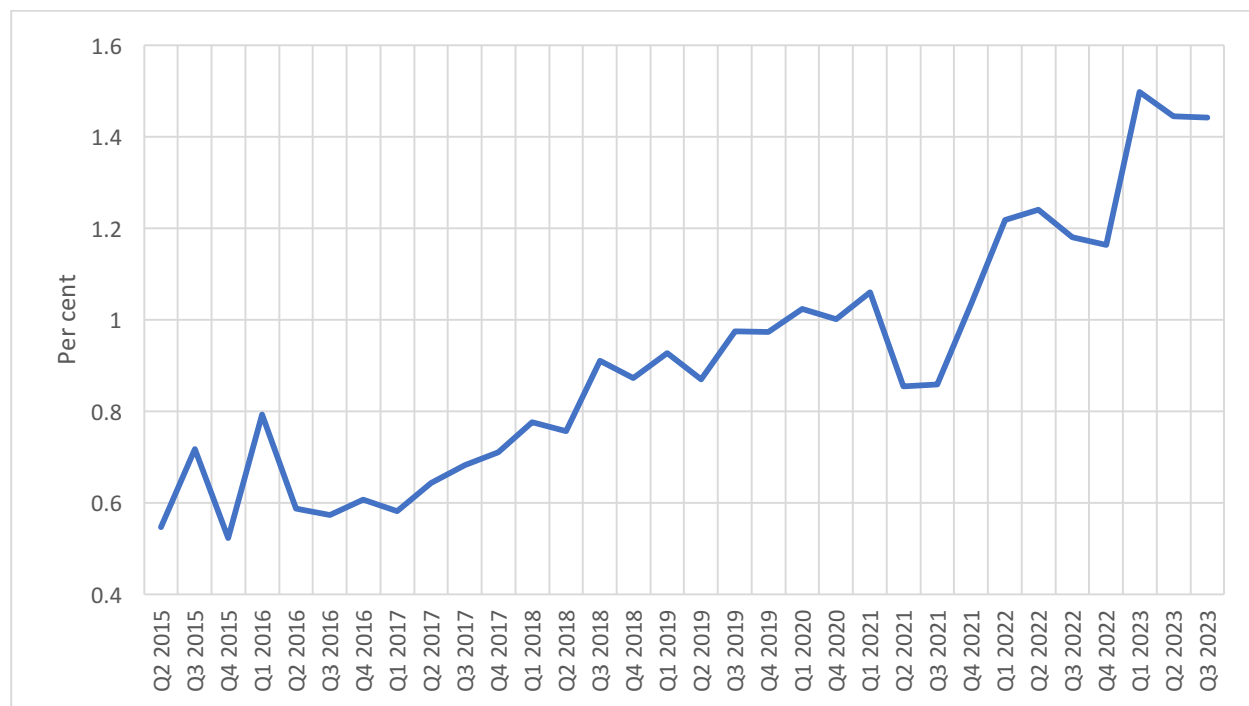

Note: The data are not seasonally adjusted.
Source: Statistics Canada, Table: 14-10-0328-01

Chart 6 illustrates the Nominal and Real average wages offered to ECEs. While the nominal offered wages have been on the rise since the onset of the pandemic, the real offered wages have not been experiencing similar increases. This simply means that the offered wages have not been raised much more than the increase in the cost of living as measured by the Consumer Price Index (CPI) in post-pandemic years.

To provide more context about vacancies and offered wages for ECEs, Chart 7 shows the share of vacancies posted by all occupations. There has been a significant uptick in the relative number of vacancies for this occupation after the pandemic in the third quarter of 2021. In fact, ECE vacancies increased from 6,000 to slightly more than 12,000 from the second quarter of 2021 to the second quarter of 2022. This represents an increase of more than 100 per cent in the number of vacancies in a year.

Chart 8 shows the quarterly variation of the offered wages to ECEs relative to the offered wages to all workers. The offered wages to ECEs have been consistently lower than that of the rest of the workers in other occupations. This is notable because even as the relative vacancies posted for ECEs have increased, the relative offered wages have not caught up. It is plausible to attribute, at least to some extent, the difficulties that the centres were facing in attracting and retaining qualified ECEs to this lack of growth in offered wages.

Chart 7: Share of Vacancies for ECEs in All Occupations, 2015- 2023

Note: The data are not seasonally adjusted.
Source: Statistics Canada, Table: 14-10-0328-01

Chart 8: Relative Average Quarterly Offered Wage (Nominal) for ECEs to all Occupations, 2015-2023
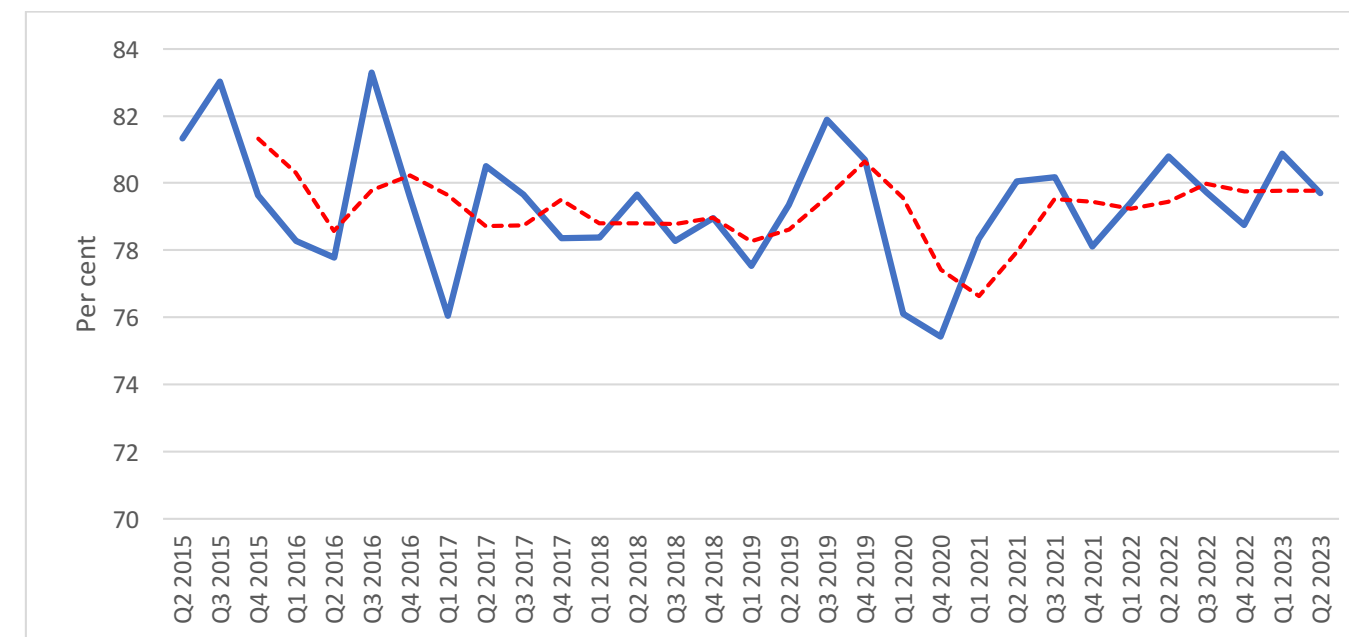
Note: The data are not seasonally adjusted. The dashed line shows the moving average of offered wages over three quarters.
Source: Statistics Canada, Table: 14-10-0328-01

Table 9: Comparison between Wages Received by ECEs with Comparable Occupations, 2021-2022

Occupation	NOC Code	Min Wage ($/hour)	Median Wage ($/hour)	Max Wage ($/hour)	Mean Wage ($/hour)
Early Childhood Educators and Assistants	42202	15	21	27.75	21.32
Instructors of persons with disabilities	42203	23	28.74	34	28.79
Social and community service workers	42201	17.25	24.18	35	25.48
Paralegals and related occupations	42200	19.23	31.25	46.88	33.18
Home child care providers	44100	14	17	22.5	17.79
Educational counsellors	41320	25	41	50.39	39.34
Elementary school and kindergarten teachers	41221	25	41.21	54.95	40.65
Secondary school teachers	41220	28.57	45.3	57.6	44.16

Source: Job Bank Wage Data obtained from https://open.canada.ca/data/en/dataset/adad580f-76b0-4502-bd05-20c125de9116. The Underlying source for all occupations is the Labour Force Survey except for Instructors of persons with disabilities whose wages were obtained from Employment Insurance Survey Data

Table 9 compares the wages of ECEs with eight "comparable" occupations. While there are many sophisticated ways one can compare different occupations, we only use occupations with similar NOC (National Occupational Classification) codes and occupational titles as reference for comparison.[11]

As the data in Table 9 suggest, ECEs have the lowest average (mean) hourly wage among similar occupations after home child care providers. We must note, however, this pay disparity could partly be explained by the differences in human capital and educational attainment of the workers in these occupations.

For instance, according to Job Bank Outlook reports,[12] Table 10 provides a breakdown of the educational attainment of ECEs and Social and Community Service Workers in Ontario.

Table 10: Breakdown of the Educational Attainment of ECEs and Social and Community Service Workers in Ontario

Occupation	No high school diploma	High school diploma	Apprentice-ship or trades certificate or diploma	College certificate or diploma	Bachelor's degree	University degree above bachelor's level
	Per cent					
Early Childhood Educators and Assistants	<5	16	<5	52	20	5
Social and community service workers	5	13	<5	45	27	9

Source: Job Bank Outlook reports.

Notably, social and community service workers had a higher share of workers with at least a bachelor's degree than ECEs (36 per cent for social and community service workers vs 25 per cent for ECEs) and a lower share of workers with at most a high school diploma (18 per cent for social and community service workers vs 21 per cent for ECEs). To what extent these educational differences can explain the observed differences in compensation levels between these occupations requires an econometric or a theoretical model that can properly account for other observable and unobservable differences between the workers in these occupations as well the unique characteristics of the nature of the tasks and working conditions existing in each occupation (e.g. a compensating differential framework). While this is an interesting question that is worthy of more attention, it is beyond the scope of this report.

According to a report by McCuaig et al. (2022) the following can be said about the non-wage benefit situation of the ECEs in Canada as of 2021:

- One-third of the licensed child care workforce receive no health benefits.
- 41 per cent receive no paid personal leave.
- Only 17.7 per cent have access to RRSPs or private pensions through their workplace.[13]

Moreover, a Canadian study by Cleveland and Hyatt (2003) reported that union status is, independently, an important determinant of child care workers' wages and that being a union member has a statistically significant positive effect (+17 percentage points) on the average hourly wage of ECEs.[14]

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[11] For example, Robinson (2011), among others, has introduced a notion of occupational distance which measures how distant two occupations are based on the skill set workers in each occupation possess well as the task requirements of the occupations.
[12] See https://www.jobbank.gc.ca/outlookreport/occupation/5180 and https://www.jobbank.gc.ca/out-lookreport/occupation/5112

[13] The source for these data is the Workforce survey in formal child care available at https://ecereport.ca/media/uploads/wr-downloads/workforce_surveys.pdf
[14] The study's sample included 2,062 educators in licensed group child care centers. The survey was administered between April and June 1991. The non-union sample size was 1800 and the remaining 262 educators were unionized. We cannot reliably estimate the share of the unionized workforce in this sector based on this rather dated study.

■ 2 | Labour Supply Elasticities of Early Childhood Educators (ECEs)

2.1 | Literature review

The labour supply elasticity of ECEs[15] with respect to wages is a crucial parameter of interest from an ECEC policy standpoint. Intuitively, it captures the degree to which those in the working-age population (individuals older than 15 years old) are responsive to wage changes in terms of the number of hours they are willing to work as ECEs.[16] Formally, denoting the labour supply elasticity with respect to wages by E, it is obtained through the following equation:

$$E = \frac{\text{(\% Change in total hours of labour supplied by the ECEs)}}{\text{(\% Change in the hourly wage of ECEs)}} \quad (1)$$

There are multiple channels through which the working-age population can theoretically respond to a wage increase in the ECEC sector:

- *Extensive Margin:* The net increase in hours because of workers from other occupations joining the pool of ECEs, those becoming ECEs from unemployment, and from outside of the labour force (including discouraged workers, students, persons with disabilities and retirees).
- *Intensive Margin:* The net increase of working hours supplied by the existing ECEs, including those switching from part-time to full-time work and those working overtime hours.
- *Turnover:* Higher monetary compensation may affect the decision of the existing ECEs to exit the occupation for opportunities in other lines of work or leave the labour force altogether.

The turnover channel is already contained in the extensive margin response. In other words, the reduction in turnover affects the existing supply of ECEs which is reflected in the extensive margin estimates. However, we discuss the elasticity of turnover separately for two reasons. First, as discussed in Section 1, retention of qualified staff is a major issue in this sector and many child care providers have reported difficulties in maintaining their staff making long-term planning an acute challenge. Second, the literature concerning the quality of child care, such as Manning *et al*. (2017), has found evidence that lower turnover rates, especially among the qualified ECEs, can positively affect child care quality.

It is essential to highlight the fact that labour supply elasticity with respect to wages can vary based both on the level and rate of change of wages in an occupation. In fact, according to labour supply theory, labour supply elasticity may be negative, positive or zero. A positive value indicates that the "Substitution effect" is more significant than the "Income effect", and therefore workers would work more hours when wages increase. A negative value means that the income effect is dominant and working hours would fall as wages increase. An elasticity of zero implies no change in working hours in response to wage changes.[17] A special case is when elasticity is equal to one (i.e. unit-elasticity). This means that for every per cent increase in the ECE wages, their labour supply increases by exactly one per cent.

Moreover, occupations with lower levels of pay generally tend to have a more elastic labour supply, and within each occupation, workers who are on the lower tail of the pay scale are more responsive to wage changes (have a higher labour supply elasticity).[18]

Despite the critical role of this elasticity (E) in mediating the labour supply response of ECEs to wages, previous literature on this topic has been very scant. This is troubling in light of the direct link between ECE labour supply, and the amount of funding required to adequately staff child care centres. Appendix A provides a comprehensive overview of the handful of studies in the literature.[19] In this section, the results obtained from the literature review are reported and used to provide estimates for the potential impacts of the proposed ECE wage increase.

Table 11 summarizes the findings based on reviewing the literature related to the labour supply elasticity of ECE workers. In terms of the labour supply elasticities with respect to wages, the literature estimates range between a low of 1.15 to a high of 4. Put simply, this means that studies have found that raising the wages of ECEs by 1 per cent, would increase the labour supply

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[15] The review and analysis in this section is relevant to the entire ECE workforce in Canada and not just limited to the ECEs employed at the YMCA.
[16] When this study refers to ECE wages, it is implied that the wage rates are measured in real wage terms (adjusted for inflation) and changes are relative to other sectors. For example, a 10 per cent increase in the ECEs wages during a specific period means that the real wage paid to ECEs has increased by 10 per cent, on top of what workers in other sectors have experienced in the same period.

[17] The substitution effect captures the relative price of working versus leisure. When wages rise, this effect always incentivizes workers to work more hours as leisure is now relatively more expensive. The income effect captures the change in incentive to work as wages increase because workers can now have the same amount of income with fewer hours of work. If leisure is a normal good -i.e. workers prefer to have more leisure when their income goes up- then the income effects negatively affect labour supply. The interaction of these two forces is thought to determine the labour supply of a worker in response to any changes in the wage rate.
[18] See Azar et al. (2019).
[19] It is noteworthy to mention that the labour supply elasticities documented here are not the same as the supply elasticity of child care in response to ECE wages. In this context, the supply of child care is defined as the availability of fully staffed child care spaces. The data on supply of child care has been scarce and it depends on many factors including the labour supply responses, capital availability, legal constraints, and regulations in the child care sector. Because of these complexities, the literature has been more focused on labour supply elasticities instead of the child care supply elasticities.

of ECEs by anywhere between 1.15 per cent to 4 per cent. As for the turnover elasticity with respect to wages; the results reported in earlier studies are much more varied and are in the range of -0.5 to -11.2. This implies that a 1 per cent increase in the wages of ECEs reduces turnover by anywhere between 0.5 per cent and 11.2 per cent. This large variation in estimates for turnover is due to the different methodologies employed in the studies as well as differences in the samples considered across various countries. A more in-depth discussion of this topic has been provided in Appendix A.

Table 11- Summary of Labour Supply Elasticities and Turnover Elasticities of ECEs Reported in the Literature

Study	Labour Supply Elasticity with respect to Wages	Turnover Elasticity with respect to Wages	Scope (Country and Years)
Blau (1993)	1.15 to 1.94	–	United States- 1977 to 1987
Blau (2001)	1.15	–	United States-1977 to 1998
Akai and Jibiki (2021)	–	-2.7	Japan- 2013 to 2018
Bassok et al. (2021)	–	-11.2	Virginia- 2019
Browsky et al. (2022)	2: for ECEs with BA 4: for ECEs without BA	–	United States-2019
Cunha and Lee (2023)	Variable: 2 for 25 per cent increase in ECE wages	-0.5	Texas-1997 to 2019
Garcia-Vazquez (2023)	1.33 for Lead teachers and 1.58 for Child care workers.	–	United States-2001-2007

Source: Estimates discussed in detail in the literature review found in Appendix A.

2.2 | Quantitative Estimates of the Increased Supply of ECEs

Given the results found in the literature survey and the range of values provided for magnitude of the elasticity of labour supply with respect to wages and turnover elasticity in the ECEC sector, we can provide a crude estimate on the expected increase in the labour supply in the sector which will be forthcoming because of a 25 per cent increase in the wages of fully qualified ECEs.[20]

Considering the suggested wage increase by YMCA Canada in this report is targeted at fully qualified ECEs, the elasticities extracted from the literature ought to be those that are relevant for the more educated segment of the ECE (i.e. those with some formal post-secondary education). For that reason, a labour supply elasticity with respect to wages of 2 is considered the baseline case in this study. This would be in line with Browsky et al. (2022) estimate for ECEs with a BA degree, Cunha and Lee's (2023) estimate of the elasticity associated with a 25 per cent increase in the wages of ECEs and is on the higher end of Blau's (1993) estimate. We will also conduct a sensitivity analysis by considering the lowest reported value in the literature for the elasticity of labour supply with respect to wages.

As for the elasticity of turnover of the ECEs concerning wages, because of the higher variability in the literature's estimates, finding a suitable value is more challenging. Of the three studies that have obtained an elasticity of turnover with respect to wages we find the one attained by Cunha and Lee (2023) to be more relevant to the Canadian context and utilize their reported estimates. This is because of the higher degree of similarity between the U.S. and Canadian economies compared to Japan (the setting for the Akai and Jibiki (2021) study) and the external validity concerns attributed to the results of the Bassok et al. (2021) study in Virginia due to their sample characteristics.

Consequently, all else equal and assuming an *overall* labour supply elasticity of 2 with respect to wages, a 25 per cent increase in the wages of ECEs would increase the labour supply in ECEC sector by 50 per cent. Furthermore, if the ratio of the extensive to intensive margins are assumed to be the same as in the paper by Blau (1993)[21], then around 62 per cent of the additional labour supply would be on the extensive margin (i.e. attracting new recruits to the sector from other sectors or non-employment including former ECEs who have left the sector) and 38 per cent would be on the intensive margin (i.e. increase in working hours of the existing ECEs). Put differently, for an elasticity of 2, the estimated increase in recruitment of new ECEs under the proposed 25 per cent wage raise would be 31 per cent and the estimated increase in working hours of the incumbent ECEs would be 19 per cent.

In terms of the magnitude of the extensive margin response, we consider the total stock of ECEs to be 207,830 in Canada as reported in Section 1.

Therefore, the estimated increase in the number of ECE workforce would be around 64,427 educators arising from the 25 per cent increase in the ECE wages.[22]

As for the intensive margin response, we use the mean number of hours of 37 reported in Doherty et al. (2000) as a reference.[23] This implies that the mean number of hours worked among the ECEs would increase by 7 hours to 44 hours per week. The theoretical increase in hours of work would be partly due to an increase in the number of hours of work among part-time educators (e.g. educators currently working 20 hours per week choosing to work 25 hours per week), those switching from part-time to full-time hours (more than 30 hours per week), full-time educators working overtime hours and both full-time and part-time educators taking more than one job in the ECEC sector (multiple job holding). This last channel of intensive response is particularly relevant in this sector in view of Seward et al. (2023) finding that slightly over half of ECE graduates hold multiple jobs one year after graduation as of 2018. This level of multiple jobs holding rate, as reported in the labour force survey (2018) is much higher than the Canadian average that year for women which was at 6.8 per cent.[24]

To put these numbers in perspective, we obtain the equivalent number of new ECEs that the intensive margin generates. Simply put, this gives the number of new ECEs that will have to join this occupation and work the same number of hours as the average weekly hours of work of ECEs to produce the same increase in the total labour supply of ECEs suggested by the intensive margin response. If the existing 207,830 ECEs work an average of 7 extra hours, then that adds 1,454,810 work hours to the supply of ECEs. Given that the average ECE works 37 hours per week, this is equivalent to adding 39,319 new ECEs that work 37 hours per week.

As a sensitivity analysis exercise, we now change the value of the elasticity of labour supply with respect to wages and consider the lowest value reported for the overall elasticity at 1.15 as found in the study by Blau (1993). An elasticity of 1.15 yields an increase of 28 per cent in terms of overall labour supply, 19 per cent at the extensive margin (equal to an additional 39,488 ECEs) and 9 per cent at the intensive margin (equal to 3.33 additional weekly hours of work or 18,704 additional ECEs). Table 12 summarizes the two scenarios considered for the labour supply response[26] of ECEs.

Table 12- Summary of Labour Supply Elasticities and Various Channels of Labour Supply Response of ECEs

Labour Supply Response Scenario	Assumed Elasticity Value	Percentage Increase in Overall Labour Supply	Potential Increase in ECE Workforce (Extensive Margin)	Potential Increase in ECE Weekly Working Hours (Intensive Margin)	Equivalent increase in the Number of ECEs (Intensive Margin)	Total Equivalent increase in the Number of ECEs
Low Estimate	1.15	28.0	39,488	3.3	18,704	58,192
Baseline Estimate	2.00	50.0	64,427	7.0	39,319	103,746

Note: There were a total of 207,830 ECEs in Canada in 2021.
Source: Author's calculations based on the results found in the literature.

This increase in the compensation of qualified ECEs also affects retention and turnover in the sector. However, we were not able to attain recent estimates for the turnover rates in the ECEC sector in Canada. The most relevant (albeit dated) figure we were able to find in the literature was 21.7 per cent per year for all positions within the ECE occupation (including supervisors, teachers, and assistants) provided by Doherty et al. (2000).

We therefore assume an annualized turnover rate[25] of 21.7 per cent, a turnover elasticity with respect to wages of -0.5, 25 per cent increase in the wages of the ECEs. **As a result, raising the wages of the ECEs by 25 per cent would reduce the turnover rate by at least 12.5 per cent**, which yields a lower sector-wide turnover rate, at 19 per cent annually.[26] In this case, about 2.7 per cent of the 207,830 ECEs —5,632 ECEs—who would have left the sector without this raise, would choose to remain employed as ECEs. This retention of ECEs can be thought of as an addition to the stock of the available educators each year. We reiterate that this number would be already accounted for in the extensive margin estimates that were provided earlier.

To gauge the effectiveness of the 25 per cent wage raise proposal we contextualize the increase in the number of ECEs within the CWELCC framework. The federal government aims to create an additional 250,000 spaces by March 31, 2026. Based on the Employment and Social Development Canada's estimates[27] this expansion of spaces requires anywhere from 52,079 to 62,600 ECEs. Even with the low estimate for the labour supply elasticity considered (a labour supply elasticity with respect to wages of 1.15), the 25 per cent wage increase can potentially attract more than enough educators and from this perspective can be deemed sufficient.

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[23] In an updated version of this report, Flanagan et al. (2009) report the median number of hours worked to be 37. We acknowledge that the mean and the median number of hours work may not necessarily be the same and thus the two values may not be comparable.
[24] Given that this occupation is predominately female we find the comparison with the female labour force more appropriate.

[25] This rate is likely higher post covid given the overview of the sector provided in Section 1.
[26] 19 = 0.875 × 21.7
[27] See https://www.canada.ca/en/department-finance/news/2022/04/supporting-early-learning-and-child-care.html

We stress that this analysis has made many simplifying assumptions and does not consider the logistical/capital constraints for expanding child care spaces. As mentioned in Section 1, there are currently long waitlists for many child care centres and meeting the excess demand in this market will certainly require creating new spaces as well which calls for more investment in infrastructure. Another caveat of the analysis provided here is the fact that we are silent about the timing of the increase in labour supply of ECEs because of higher wages. We will address this point to some extent in section 2.3.[28]

Another method for evaluating the adequacy of this potential increase of the ECE workforce in response to the proposed wage increase is to take the estimates of the number of "Child Care Deserts" provided in Macdonald and Friendly (2023). The authors estimate that there were 759,000 full-time licensed spaces for younger children (defined as not yet attending kindergarten) across Canada in child care centres and home-based centres in 2021 and that there were 1.97 million younger children who were in the pool of potential users of these spaces. Their findings indicate that 946,000 children lived in child care deserts. Their unit of analysis is the Forward Sortation Area (FSA), which is the first three digits of the postal code as the lowest level of geographic identification. A child care desert is, therefore, a FSA that has more than three children for every licensed child care space. A possible goal of a universal child care program such as the CWELCC may be to eventually reduce that figure to zero. To that end, it is imperative to know how many educators are needed to provide that number of spaces and make some assumptions about the mapping of those available spaces to children.

We assume that in the ideal scenario, there will be exactly one child care space for each child (i.e. no sharing of spaces). Given the differences in the staff-to-child ratios across provinces and their dependence on children's age, such measure can be approximated by considering a conservative estimate of 6 for the overall child-to-staff ratio within CWELCC at the national level.[29] This implies that 157,666 ECEs would be needed to fill in the gap in the ECE workforce to eliminate the aforementioned child care deserts. The employment gains ensuing a 25 per cent increase in ECE wages would be able to cover almost 66 per cent of that shortfall under the baseline scenario, and 37 per cent under the low estimate for elasticity within a year. It is important to note once again that this analysis only considers the increased labour needed for the expansion of child care and not the capital/infrastructure requirements which can add to the amount of time and funding needed to expand the child care spaces.

2.3 | Potential Sources of Additional Qualified ECEs and Limitations to Increasing the Labour Supply

In this section we discuss some of the limitations of the analysis conducted so far. There are three main sources that the child care sector can tap into for attracting new qualified ECEs: former ECEs that have the qualifications needed to work in the sector in a specific jurisdiction (province or territory); college and university graduates including both graduates with no previous work experience and those who would switch their occupation to be employed as an ECE; immigrants and foreign workers that have experience working as an ECE abroad but their qualifications are not recognized in the jurisdiction that they may want to work. Except for the first group, everyone else will be required to obtain some additional training which is mainly provided by colleges and universities.[30]

Seward et al. (2023) report that between 2009 to 2018, ECE college/university programs had an average of about 6,720 graduates per year across most of Canada.[31] Table 13 shows the regional distribution of these ECE graduates as well as the relative share of children living in each province. As the data in Table 13 suggest, only three provinces, Ontario, Quebec, and New Brunswick had a higher share of average ECE graduates relative to their child population. In fact, Ontario, and Quebec account for 78.7 per cent of the early childhood education graduates per year while having only 60.9 per cent of children aged younger than six years in Canada.

Table 14 provides context for these numbers considering the CWELCC agreements that each province has signed with the federal government. Based on the number of average graduates that become qualified ECEs each year, the number of net spaces required to be created under the CWELCC (excluding Quebec) and the ratio of qualified staff to total staff required by each province. While there is a significant amount of variation among different provinces, it takes approximately four years for the post-secondary education system in Canada to provide a sufficient number of graduates to support the expansion of the universal child care program.

Table 13- Regional Distribution of the Average Number of ECE Graduates and Shares of Children, Canada, 2009-2018

Occupation	(1) Average Number of Graduates	(2) % Graduates	(3) %Children (0-5 years old)	(4) Difference (Percentage points)
AB	390	6.07	13.74	7.7
BC	450	7.01	12.33	5.3
MB	140	2.18	3.94	1.8
NB	150	2.34	1.8	−0.5
NL	<30	<0.47	1.13	
NS	40	0.62	2.28	1.7
ON	3,250	48.36	38.02	−10.3
PEI	<30	<0.47	0.36	
QC	2,170	33.8	22.86	−11
SK	130	2.02	3.52	1.5
Canada (total)	**6,720**	**100**	**100**	**0**

Note: The Canada (total) row was added to the table. The Ontario row sums the average number of ECEs and RECEs that were reported separately in the original table. For Newfoundland and Prince Edward Island, the average number of graduates per year in each province cannot be released because of confidentiality rules.
Source: CSLS Based on Seward et al. (2023)- Table 1 (Parent Source: Post-Secondary Information System 2 009–2018; Registered Apprenticeship Information System 2010–2017; Statistics Canada Table 39-10-0041-01.)

Table 14- Estimates of New Supply of ECE Graduates Needed by 2025–2026 as a result of New CWELCC Agreements

Province	No. of Promised New Full-Time Spaces (1)	No. of Total Staff Needed (2)	Ratio of Qualified Staff Required (3)	No. of New ECE Graduates Needed (4) = (2) *(3)	Average No. of New ECE Graduates per Year (5)	Years Needed to Train Enough ECE Graduates to Fill Promised Spaces (6) = (4)/(5)
AB	42,500	8,180	33	2,699	390	7
BC	30,000	6,250	60	3,750	450	8
MB	23,000	3,833	66	2,530	140	18
NB	3,400	730	50	365	150	2
NL	2,790	612	66	404	<30	20
NS	11,900	2,149	66	1,418	40	35
ON	76,700	15,980	60	9,588	2,880	3
PE	578	122	33	40	<30	2
QC	N/A	N/A	66	N/A	2,170	N/A
SK	28,000	5,911	50	2,956	130	23
Canada (Except for Quebec)	**218,868**	**43,767**	**N/A**	**23,750**	**6,350**	**4**

Note: The Canada row was added to the table. Data from Quebec are missing from Table 2 because they will not adhere to the new federal framework and will continue to receive federal funding and to provide programs and services for families and children. For this table, the authors assume that there are roughly 20 graduates per year in Newfoundland and Labrador and Prince Edward Island, where the average number of graduates per year in each province cannot be released due to confidentiality The agreement in each province generally provides only the net new spaces to be added in total rather than by age range. The authors calculated the new spaces by age range on the basis of an equal allocation assumption. The years needed to train enough early childhood education graduates to fill promised spaces is calculated by the number of new graduates needed divided by the average number of new graduates per year.
Source: CSLS based on Seward et al. (2023)- Table 2 (Parent Source: Canada (2022); Friendly et al. (2020); McCuaig, Akbari, and Correia (2022); Postsecondary Student Information System 2009–2018; Registered Apprenticeship Information System 2010–2017.)

Seward et al. (2023) report, only 1.4 per cent of ECE university graduates and 6.6 per cent of ECE college graduates were international students. This indicates that these programs do not seem to have been well positioned to utilize the recent expansion of the pool of international students in Canada.[32]

To the extent that educators are not required to become fully qualified (obtain ECE qualifications at college and university levels), such as assistants or former ECEs, the capacity of the colleges and universities to graduate enough students will not pose major challenges to the increase in the supply of ECEs. However, many new ECE recruits with no background in ECE or unrecognized ECE credentials (immigrants and some out-of-province educators) will have to obtain ECE diplomas/certifications and that could hamper the intended rise in the labour supply of ECEs resulting from any wage increase.

■ 3 | Social Benefits and Returns to Investment

3.1 | Maternal labour supply

The increase in female labour supply is certainly one of the main goals of modern child care systems. Chart 8 illustrates the trends in labour force participation in Canada by sex from 1976 to 2022. Women have increased their labour force participation by 15.9 percentage points in that period and the labour force participation gap between men and women has narrowed considerably. However, most of that narrowing occurred between 1976 to 2002 and since 2002, the upward trend in female labour force participation has stagnated. This is in part driven by the aging of the workforce in Canada, due to an increase in the share of workers older than 65 years old, but there are other factors in play as well. In addition, to the extent that women do participate in the labour force, they still tend to work fewer hours. Apart from the loss of potential GDP gains that this may entail, it will have important implications for the equity between labour market outcomes between men and women.

A large literature, both in Canadian and international studies, has focused on the linkage between the accessibility of formal child care services and maternal labour supply. In this section, we briefly highlight the main findings of the studies that have investigated Quebec's universal child care program and then locate these findings in an international context. Subsequently, we use two different estimation strategies to quantify the potential labour supply of mothers in response to an increase in child care spaces that can be attributed to the proposed increase in ECE wages.

Chart 8- Labour Participation Rates in Canada: By Gender, 1976-2023
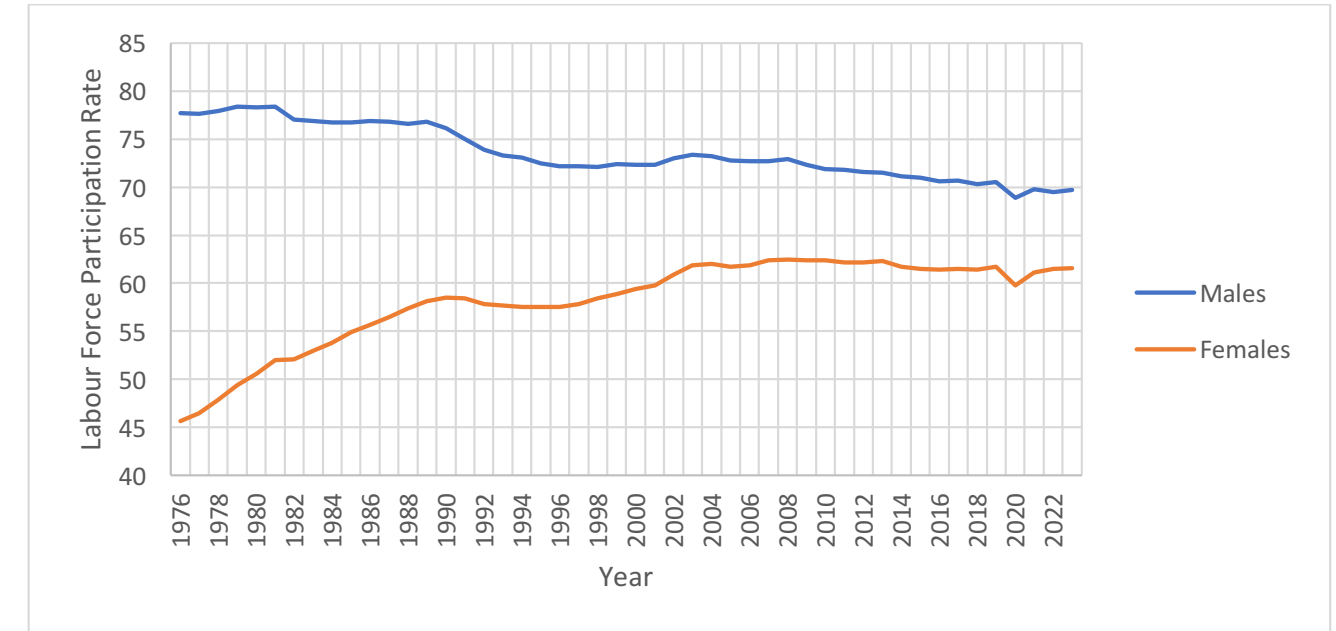
Source: Statistics Canada- Table 14-10-0327-02

3.1.1 | Lessons from Quebec Universal Child Care Reform and the Maternal Labour Supply Response

In this subsection, we will provide an overview of the studies that have investigated Quebec's experience with the universal child care program. We discuss the results reported, specifically as it relates to the labour supply response of mothers to the availability of low-fee spaces in the province. We then proceed with providing some basic data related to the evolution of the labour force participation of mothers in Quebec and the rest of Canada since 1976. We subsequently use the estimates provided by the literature to control for a variety of factors that may have contributed to the trends in labour force participation of mothers in Quebec. We do so to estimate the potential labour supply response of mothers in the rest of Canada if they gain access to a Quebec-style universal child care program under the CWELCC agreements.

In a recent paper, Montpetit (2023) uses novel data on child care coverage rates within Quebec in the period between 1998 to 2003 to find that in regions where child care supply increased the most,[33] the policy increased maternal labour-force participation by 15.6 percentage points relative to regions with less expansion. He finds that Quebec in general experiences 7.7 percentage point additional growth in the maternal labour force compared to the rest of Canada (in line with the estimates provided by Baker et al. (2008)). In addition, he finds that on average, mothers eligible to use universal child care work two additional hours per week.

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[32] Although it is worth mentioning that more recently the federal government has put a cap on the number of international students entering Canada. More details can be found at https://www.canada.ca/en/immigra-tion-refugees-citizenship/news/2024/01/canada-to-stabilize-growth-and-decrease-number-of-new-interna-tional-student-permits-issued-to-approximately-360000-for-2024.html

[33] Defined as the regions in the top two thirds of child care coverage expansion.

Lefebvre and Merrigan (2008) show mothers with children aged 1 to 5 years old increased their participation rate between 8.1 to 12 percentage points, experienced growth in annual earnings by $5,000-$6,000, increased their annual hours of work by 231-270 per year relative to the rest of Canada between 1999 to 2003. Lefebvre et al. (2009) compared Quebec mothers with children of different ages (0 to 5 years old, 6 to 11 years old, and those 12 to 17 years old) and mothers in other Canadian provinces to find that the low-fee universal child care in Quebec increased annual work hours for mothers, particularly for those with a high probability of receiving a subsidy for a child under the age of 5, and those with less education. The effects in both studies were driven by the employment of less-educated mothers.

Focusing on the longer-run effects of Quebec's universal child care policy on maternal labour supply, Haeck et al. (2015) estimate that average hours of care including those with no use of child care increased substantially from two hours in 1998 to 11 hours per week in 2008.[34] One of the novelties of the Haeck et al. (2015) paper is that it allows the progressive increase in the number of low-fee spaces to interact with the employment and child care use estimates. For instance, between 2000 and 2001, they found a 5-percentage point increase in mother's labour force participation rate in Quebec compared to the rest of the country. This growth of maternal labour force participation rate in Quebec relative to the rest of Canada reached a peak of 13 percentage points between 2004 and 2005 and remained close to this level until 2008. The same incremental and positive increasing trend is also observed with the number of weeks worked by mothers between 2000 and 2008.

The international evidence investigating the relationship between maternal labour supply and access to reduced-fee child care is more mixed. Morrissey (2016) provides a comprehensive survey of the international literature that focuses on the relationship between parental labour force participation and child care *prices*. The results indicate that a 10 per cent reduction in the price of child care would lead to a 0.25–11 per cent increase in maternal employment, likely between 0.5–2.5 per cent. We note that since under the CLWCC reform child care fees in regulated centres will be reduced to around $10 per day, estimating the price elasticities will not be a focal point of this study. What matters more in the context of the CWELCC implementation is the access to the low-fee spaces. In Appendix B, we highlight some of the most notable and relevant studies that investigate universal child care reforms.

In what follows, two different approaches will be used to estimate the effects of the increase in the wages of ECEs on the labour supply of Canadian mothers, in a setting where the CWELCC reforms have been fully implemented. The first approach assumes that the outcomes observed in Quebec's reform can be extrapolated to the Canada-wide reform. While this is a simplifying assumption, we do not consider it as an accurate forecast of the labour supply response of mothers as a multitude of variables including the scope and domain of policies, the jurisdictions

impacted, and the period of the implementation are different. However, given that Quebec's reform is a relatively recent experience in Canada and the major similarities between the two reforms, we believe that this analysis can be the first step in understanding what to expect from the expansion of spaces in the CWELCC framework. Alternatively, we estimate the potential labour supply responses of mothers by accounting for the demand for regulated spaces in Canada and obtain an estimate of the impact of an increase of such spaces brought about by a 25 per cent increase in ECE wages on the labour supply of mothers in Canada.

3.1.2 | Extrapolation of Quebec Reform Results to the Canadian Context

Maternal Employment

In this subsection, we estimate the maternal labour supply elasticity with respect to the expansion of child care space using the maternal labour supply responses obtained by the studies in Quebec. To provide some background, we first look at the evolution of the labour force participation rates of mothers between 25 to 54 years old and with children aged 0 to 5 years old (the population most likely to be affected by universal child care reforms) in Quebec and the rest of Canada.

Quebec's universal child care was rolled out on September 1, 1997, with the aim of increasing mothers' labour force participation and improving child development and addressing inequalities in this regard. It mandated the provincial government to lower the rate for regulated child care spaces to $5 per day in a gradual manner. This meant that parents would pay a fixed reduced rate of $5 a day for child care, and the government assumed the remaining cost. Initially, only children who had reached the age of four by September 30, 1997, were eligible but by September 1, 2000, all children aged 0 to 5 years old were eligible. In the phase-in of the program existing fee-waiving and financial aid programs would also be gradually discontinued as the universal child care program was expanding.

As Chart 9 illustrates, while the participation rate of mothers with children 0 to 5 years old in Quebec had been converging to that of the rest of Canada since the early 1980s, the gap between the two jurisdictions persisted until 1999. Since then, the maternal participation rate has been consistently higher in Quebec relative to the rest of the country. While we cannot establish a causal relationship just based on a single chart, this piece of evidence lends support to the effectiveness of a universal child care program in bolstering maternal labour force participation. If we focus on more recent developments in the labour force participation rate of mothers with young children, it is interesting to note that in 2023 it has increased only by 0.3 per cent in the rest of Canada while it has increased by 2.2 per cent in Quebec. A recent re-

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[34] Excluding children not participating in child care, they find the conditional effect on child care use to be additional 2.1 hours per week in child care in 1998 and 3.8 hours more per week in 2008 with a peak at 5.2 hours in 2004. Therefore, not only did the reform induce child care participation, but it also increased the intensity of care for those participating.

port by the Cross (2024) (Fraser Institute) highlights this issue[35] and takes this as evidence that the national universal child care program has not been successful in its goal of promoting female labour force participation. While even the more relevant data corresponding to mothers' participation rates show that the rest of Canada is falling behind Quebec, we believe the effectiveness of the program should be evaluated based on the number of spaces it has created. While we do not have the data for 2022-2023 on the number of centre-based child care spaces, Beach et al. (2023) report that number of spaces for children between 0 to 12 years old fell from 1,506,658 in 2019 to 1,490,046 in 2021. Furthermore, according to Statistics Canada (2023) in 2023, 26 per cent of parents of children 0 to 5 years old who were not using child care reported that their child was on a waitlist, up from 19 per cent in 2022. These data show that the number of low-fee spaces has certainly not increased significantly and therefore one can attribute the lack of considerable labour force participation response to this slow expansion of the program.

To better illustrate the magnitude of relative changes in labour force participation in Quebec and rest of Canada, we provide the size of the labour force and labour force participation rates of mothers 25 to 54 with children under the age of 5 in Quebec and the rest of Canada between 1998 to 2009 in Table 15. We chose to reflect on this period because it encompasses the early phases of the reform's enactment in Quebec, and it also coincides with the period that will be used to estimate the elasticity of the labour supply of mothers with respect to child care space availability.

Chart 9: Labour Force Participation Rates of Mothers (25-54 years old) with Children ages 0-5 in Quebec and Rest of Canada, 1976-2023
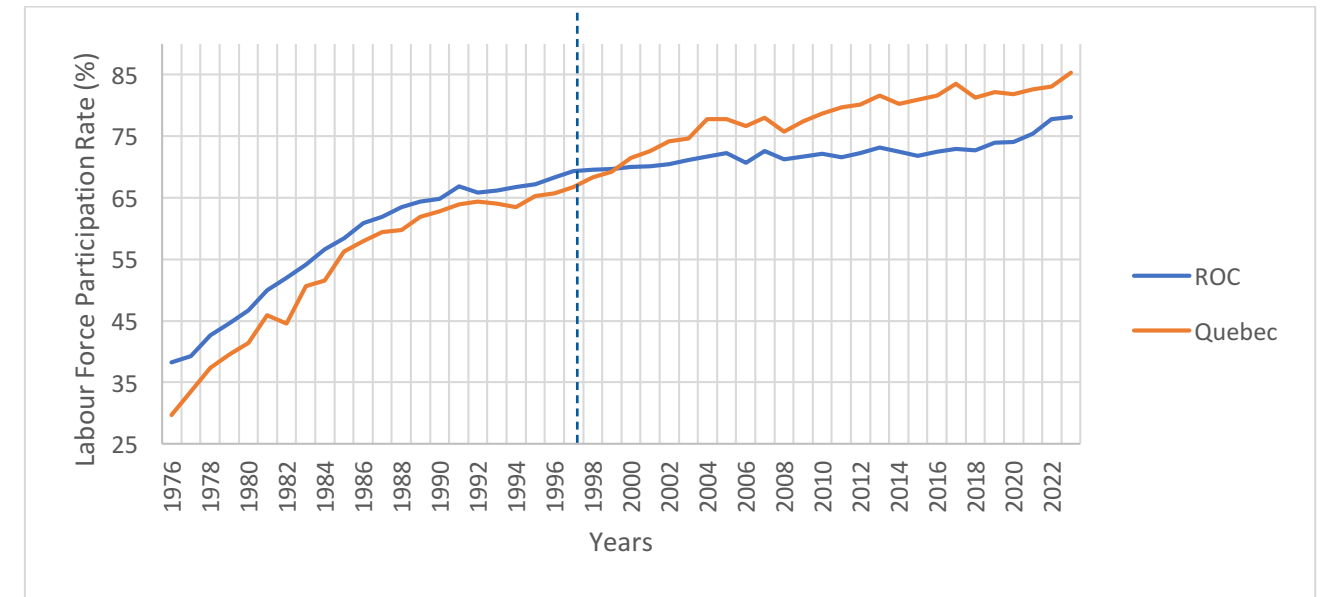
Source: Statistics Canada. Table 14-10-0396-01

Table 15: Labour Force and Labour Force Participation Rates of Mothers 25 to 54 Years old with Youngest Child 0 to 5 years old

Labour Force Participation Rate (per cent)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Quebec	65.27	65.67	66.73	68.36	69.2	71.49	72.62	74.17	74.63	77.79	77.8	76.68	77.94	75.71	77.36
Rest of Canada	67.14	68.30	69.27	69.53	69.66	69.94	70.12	70.47	71.09	71.67	72.22	70.62	72.53	71.21	71.71

Labour Force (Thousands of persons)	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Quebec	237	235.7	234.9	230.7	222.2	217.9	219.3	223.4	219.1	222.7	241.8	228.2	244.5	232.2	232.7
Rest of Canada	740.5	749.1	751	735.3	733	732.5	709.8	717.6	711.8	722.6	757.9	703.9	722	742.8	740.5

Source: Statistics Canada. Table 14-10-0396-01

[35] The report examines women participation rates as opposed to those of mothers, which we believe is a more appropriate population in the context of child care. For a more in-depth critique of the Fraser Institute study see the article by Gordon Cleveland at https://childcarepolicy.net/the-fraser-institutes-evaluation-of-the-10-a-day-child-care-reforms/

Table 15 shows that the labour force participation for mothers between 1998 (the first full year of the implementation of the program) to 2009 grew by 9.0 percentage points while the increase in the rest of Canada was only 2.2 percentage points. Juxtaposing the changes in labour force for our population of interest (mothers between 25 to 54 years old and with youngest child under 5 years old) and the availability of subsidized child care spaces in Quebec would allow us to estimate the correlation between these two variables. The number of subsidized child care spaces in Quebec for each year since 1999 is accessible through the Government of Quebec's website. The subsidized spaces include Centres de la Petite Enfance (CPEs) or child care centres, and Garderie Subventionnée (GS) or Day care centres. Table 16, column (3) contains the number of subsidized child care spaces in Quebec from 1998 to 2009. The increase in the number of spaces between 1998 to 2009 is 80 per cent. This implies that every 8.8 percentage points increase in the availability of subsidized child care spaces was associated with a percentage point increase in maternal labour force participation.

We must stress we are not trying to estimate the labour market impacts of *any* child care space. Rather, we are narrowly focused on a universal program that involves the creation of subsidized spaces in not-for-profit centres. It is certainly the case that in Quebec, many of the spaces created were in the for-profit centres. This was especially driven by the tax credits that the government of Quebec provided to families using these for-profit spaces. It also means that the potential benefits of the expansion of these spaces stem from both the for-profit centres and the not-for-profit. However, we do not account for the contribution of the for-profit centres in our analysis because the rest of Canada will not necessarily experience the same expansion in for-profit spaces as Quebec did (it is not part of the CWELCC plan). In addition, we cannot separately identify the contribution of the for-profit and the not-for-profit space expansions. We note that, for-profit contribution is mainly through lower prices (i.e. mothers joining the workforce because they have found a lower fee for-profit space) as opposed to an availability channel (i.e. mothers joining the labour force because there are nearby for-profit centres that they can send their child to).

It is also critical to notice that these calculations do not necessarily represent the actual elasticity of maternal labour supply with respect to child care spaces unless we can control for a variety of other factors such as changes in preferences, aging of the population and cost-of-living expenses that influence the labour participation of mothers that are unrelated to the expansion of subsidized child care spaces. For that reason, we use the labour supply response estimates in the paper by Haeck et al. (2015). The authors obtain the labour force participation response of mothers with children 1 to 4 years old in Quebec relative to the rest of Canada up to 10 years after the implementation of the reform. In simple terms, this estimated coefficient represents the degree to which mothers who lived in Quebec before and after the expansion in low-fee child care spaces, increased their labour supply participation relative to mothers who shared the same observable characteristics in other parts of Canada.[36]

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[36] The observable characteristics that the econometric model controls for include (1) the sex of the child; (2) child age dummies; (3) the age group of the mother at child's birth (25−29, 30−34, 35 or older; with 14−24 as the omitted group); (4) the family type (single-parent, with two-parent family as the omitted group); (5) a dummy for whether the mother was born in Canada; (6) the mother's highest level of education (less than a high school diploma, high school diploma, some postsecondary education, trade, or college diploma, with a university diploma or more as the omitted group); (7) the presence of siblings (older, younger or same age, and the omitted group is children with no sibling), and other children; (8) the size of the community of residence (5 groups ranging from rural to 500,000 inhabitants; the omitted group is those with more than 500,000 inhabitants); and (9) the provincial unemployment rate.

Formally, we calculate:

$$\varepsilon_S = \frac{\text{Change in the labour force participation of mothers}}{\text{\% Change in the susbsidized child care spaces}} \quad (2)$$

Table 16, column (1) provides the estimates reported by Haeck et al. (2015) between 1998 to 2009. Since NLCSY (National Longitudinal Survey of Children and Youth), the underlying data utilized by the authors is biennial, the labour force participation growth rates are reported every other year, and the elasticities of maternal labour supply with respect to child care spaces are calculated accordingly. These elasticities are increasing over time. During the first two years of the implementation of the reform, the elasticity is found to be around 0.24, while it increases to 3.08 between 2007 and 2009. We can infer from these elasticities that a 1 per cent increase in the availability of child care spaces in Quebec led to 0.24 percentage points growth in maternal labour force participation between 1998 to 2000 and 3.08 between 2007 to 2009. However, the elasticities calculated in Table 16, column (3) should be treated with caution as the subsidized spaces reported in column (4) do not include home-based child care centres- Milieu Familial (RSGE)- for the years we are interested in. These centres make up a non-trivial portion of the subsidized centres network and therefore the real expansion in the total number of child care spaces is certainly greater than what Table 16 suggests. Therefore, we believe the elasticities reported here represent the upper bound of the actual elasticity values. In addition, the significant increase in the calculated elasticities from 1998 to 2009 seems a bit surprising. This partially could be accounted for by our incomplete information about the actual number of subsidized spaces as well the delays and long wait times that parents were facing in the initial years of the program's implementation. In other words, the fact that parents were not able to find subsidized spaces may have suppressed the labour supply response of mothers to the increase in child care spaces in the beginning and the response became stronger as the program matured, and more spaces became available. It may have also been the case that early on mothers who were already working were more likely to enroll their children into the program. This would in turn reduce the number of spaces that would have been otherwise taken by mothers who were not participating in the labour force and would have decided to start working if they could use the subsidized child care service.

Table 16- Maternal Labour Supply Elasticities (Extensive Margin) of Mothers with Children 1 to 4 years old with Respect to Child Care Spaces

Period	Labour Force Participation Increase (%) (1)	Percentage Change in Subsidized Spaces % (2)	Subsidized Spaces (3)	Biennial Growth in Subsidized Spaces (4)
1998-1999	0	N/A	63,528	N/A
2000-2001	5	20.6	76,620	13,092
2002-2003	8	15.0	88,079	11,459
2004-2005	13	16.0	102,188	14,109
2006-2007	10	7.6	109,961	7,773
2008-2009	12	3.9	114,241	4,280

Note: The Subsidized Spaces include only centre-based (Not-for-profit and for-profit centres that offer low-fee spaces). The estimates for home-based spaces were not available in the latest data announced by the Government of Quebec's website.
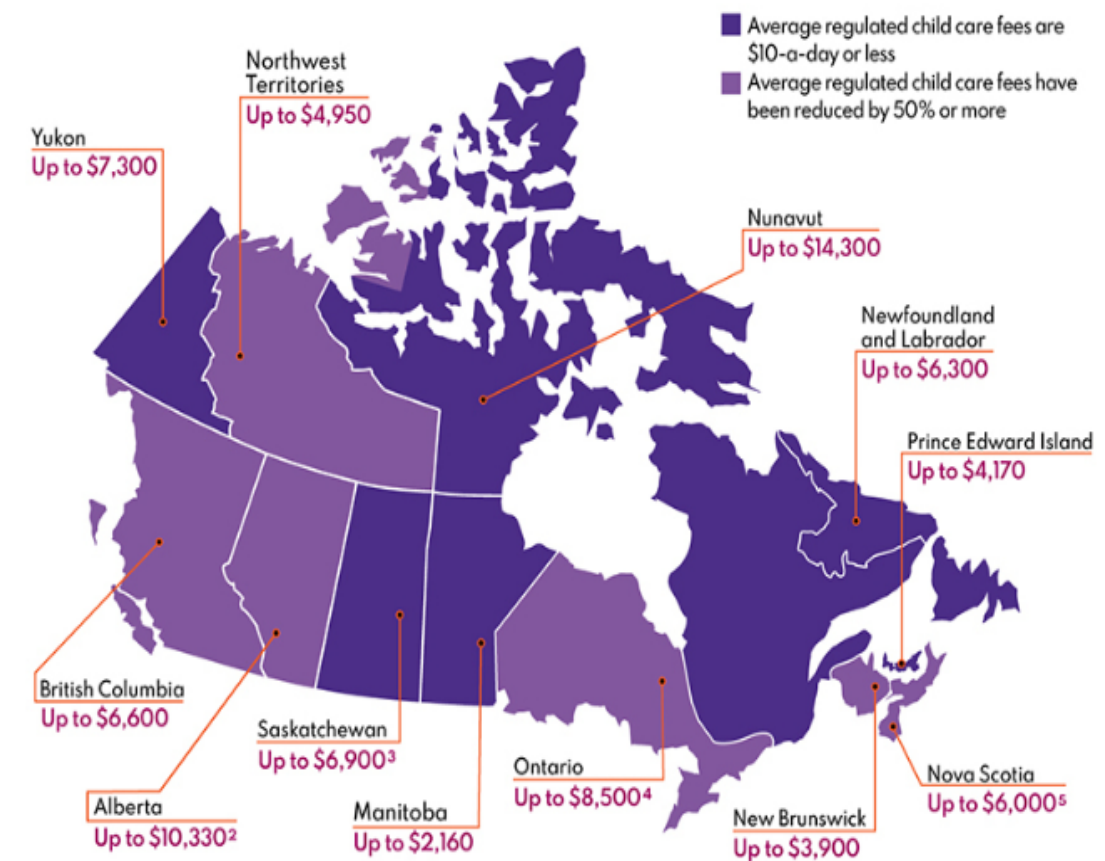*Source: The relative labour force participation rate growth is obtained from Haeck et al (2015)- Table 2. Subsidized Spaces data were gathered from the Government of Quebec's website at https://cdn-contenu.que-bec.ca/cdn-contenu/adm/min/famille/publications-adm/Developpement-places/Developpement-places-glob-al-1999.pdf*

We would need to make some additional simplifying assumptions and clarify a few points before proceeding further with the analysis. First, because labour supply elasticities of ECEs with respect to wages that were introduced in Section 2 were static (one-time bonus of 25 per cent wage increase), we cannot estimate the dynamic impacts of the increase in spaces on maternal labour supply. Effectively, our estimates capture the static responses of mothers' labour supply (those with children 1 to 4 years old) to the availability of low-cost spaces.

Second, it is important to stress that the rest of Canada is not homogenous in terms of its child care system. In fact, there are substantial provincial differences. Other than Quebec, there are four other provinces and two territories that have achieved average fees lower than $10 per-day, per-child (Figure 2). There are quite divergent coverage rates depending on the province. Provinces with low coverage rates experience a larger maternal labour supply response because of space expansions compared to provinces with higher coverage rates. We are abstracting from these provincial differences to avoid complicating the analysis further. In a sense, we are averaging out these coverage differences within the rest of Canada. So, one can interpret our results as the average of to the rest of Canada vs Quebec.

Figure 2: Fee reductions and estimated gross annual savings for regulated/licensed child care per child as of January 1, 2024 (compared to 2019 fees)

Source: https://www.canada.ca/en/employment-social-development/campaigns/child-care.html

For estimating the static response, we take the average relative increase in the labour force participation rate of mothers in Quebec and the average increase in the number of spaces over the 1998 and 2003 period. As the note in Table 16 mentions, the Government of Quebec's data does not include the home-based centres that were offering low-fee spaces in Quebec.[37] With that caveat in mind, around 32,276 spaces were created between 1998—1999 and 2002—2003 (the first 5 years of the program). This implies that the number of regulated centre-based spaces would have increased by 50 per cent in this period (0.50 = 32,276/63,528). The average increase in the labour force participation of mothers five years into the implementation of the program is

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[37] The Government of Quebec published data states: "It should be noted that we do not hold, for the years indicated by N/A, the number of places offered in the RSGE (Home-based spaces), as we only hold the maximum number of places authorized in the budget (upon approval). As the two data were not comparable, it was not possible to complete the information."

10.5 percentage points (the average of rows 3 and 4 of column 1 of Table 16). Therefore, the implied elasticity of maternal labour supply of mothers with children 1 to 4 years old in Quebec would be:

$$\mathcal{E}_S = \frac{10.5}{50} = 0.21$$

As was shown in Section 2, the additional ECEs entering the ECEC sector due to **the 25 per cent increase in ECE wages, would allow the 250,000 additional spaces intended by the CWELCC agreements to materialize.** The report Early Childhood Education and Care in Canada, 2021 (Beach et al., 2023) estimates that there were 627,333 regulated child care spaces for children under the age of 5 in Canada.[38] This entails that subsidized spaces would increase by 40 per cent. Hence, the implied increase in labour force participation of mothers with children 1 to 4 years old in Canada would be around 8.40 percentage points (8.40 = 40 × 0.21) over five years or an annual average of 1.68 percentage points.

3.1.3 | Estimation of Maternal Labour Supply Based on Projected Space Availability and the Current Potential Demand for Child care Spaces in Canada

We now turn to an alternative method for estimating the potential increase in mothers' labour force participation that the expansion of low-fee child care spaces can bring about.

According to Survey on Early Learning and Child Care Arrangements (SELCCA) conducted by Statistics Canada, as of 2023, 44 per cent of children under the age of 6 did not use any form of non-parental child care (licensed or unlicensed) services in Canada.[39] In December 2023, there were 303,300 mothers aged 25 to 54 with youngest children between 0 to 5 years old in Canada who were out of the labour force considering a child-to-mother ratio of 1.33 (as implied by the current national fertility rate), that amounts to 403,389 children. We note that about 38 per cent of parents who do not use child care services have stated a preference for caring for their children according to Statistics Canada (2022b). Therefore, the estimated "take-up" of universal low-fee regulated child care services by mothers who are not in the labour force would be approximately 188,046 mothers or 250,101 children.

This estimate has two caveats. First, it does not account for mothers who will not work even if they use formal child care. To address this issue and estimate the Number of non-employed that will not join the labour force even if they use a centre-based child care space, we utilize the estimates provided by Zhang et al. (2021) from the 2017 GSS (General Social Survey) sample of mothers with children 1 to 12 years old. In their sample, 34.2 per cent of mothers have children 1 to 3 years old and 7.1 have children 4 to 5 years old. Together, they make up 41.3 per cent of the sample. Non-employed[40] mothers make up 18.6 per cent of their sample. The authors report that 38.7 per cent of mothers with children 1 to 3 years old and 37.3 per cent of mothers with children 4 to 5 years old who are not employed use some type of non-parental care. About 46 per cent of mothers with children 1 to 3 years old and 37.3 per cent of mothers with children 4 to 5 years old use child care centres and 72 per cent of the sample use full-time care. Therefore, the share of non-employed mothers that will be using a full-time child care space and remain non-employed can be estimated as follows:

> Share of *non-employed mothers* with children 1 to 5 years old using child care = (34.2/41.2) × 38.7 + (7.1/41.2) × 37.3 = **38.5%**
>
> Share of all *mothers* with children 1 to 5 years old who use centre-based care = (34.2/41.2) × 46 + (7.1/41.2) × 37 = **44.6 %**
>
> Share of *non-employed* mothers among all mothers using child care = **18.6%**
>
> Share of all mothers with children 1 to 5 years old who use centre-based care and are *unemployed* = 38.5% × 44.6 % × 18.6% = **3.1%**

Second, it does not factor in the "crowding-out" effect. As previous studies such as Haeck et al. (2015), Havnes and Mogstad (2011) and Baker et al. (2008) have documented, the introduction of low-fee and universal child care can "crowd out" a significant portion of informal care (i.e. care by a family member or friend, unregulated home-based child care, at-home care by a nanny and other alternative arrangements). It is not clear ex-ante how significant this crowding-out effect would be. In what follows, we will try to estimate the potential size of this effect.

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[38] Number of regulated full- and part-day child care centre spaces for children 0 − 5 years old (627,333). We note that this is an under-estimate of the total number of spaces as we have not been able to find the breakdown of centre-based and home-based spaces
[39] See https://www150.statcan.gc.ca/n1/daily-quotidien/231205/dq231205a-eng.htm

[40] Excluding mothers on maternity leave.

Estimation of the Crowding-out of Informal Care

As Baker at al. (2008) mention, the difference between the increase in child care use (measured by the increase in the *number of children* enrolled in child care) and the increase in maternal labour force participation, is due primarily to the crowding out effect of the informal child care arrangements. Because at this stage we do not have an estimate for the maternal labour force participation response (in fact, estimating this is the goal of this section), we assume that the crowding out effect will have the same per cent change in response to a per cent increase in spaces that it had in Quebec.

Montpetit (2023) provides the percentage of increase in children being in formal care (Centre-based care) between 1997 and 2003 in Quebec. Using the growth in centre-based spaces, we would be able to infer the elasticity of crowding out of informal child care arrangements with respect to the expansion of regulated spaces. Montpetit (2023) estimates that the use of formal child care grew by 13.8 percentage points by 2003 from its baseline of 42 per cent in 1997. Given there were about 530,000 and 443,000 children 0 to 5 years old in Quebec in 1997 and 2003 respectively (Beach et al, 2023), that implies a growth of the number of children in care from 222,600 to 265,800 or 19.4 per cent.

In the same period, the labour force participation rate of mothers with children between 0 and 5 increased by 7.7 percentage points in Quebec, from a baseline labour force participation rate of 66.7 per cent and a labour force size of 234,900 in 1997. This represents a growth of labour force to 261,888 or 11.4 per cent.

Therefore, the upper bound of the crowding out of informal care in that period would be 41 per cent (41 = (19.4-11.4)/19.4) per cent of additional spaces.[41] So if 250,000 spaces are created, 102,500 will be used by mothers who are already employed. Subtracting this from the potential take-up of 250,101 spaces yields:

Child care space take-up - crowding out = 250,101 − 102,500 = 147,601 spaces

Considering a child-to-mother ratio of 1.33, that is equivalent to 110,978 mothers. As a result, the estimated increase in the labour force participation of mothers is 110,978. Therefore:

$$\text{\% Increase in Maternal labour force} = \frac{(110,978)}{(1,175,100\,)} \times 100 = 9.44\% \quad (3)$$

This represents a 9.44 per cent increase over the current baseline of the maternal labour force or 7.54 percentage points over the current labour force participation rate of 79.7 per cent for mothers with children under five years old.

Note that the number estimated above is not directly comparable to the results in Subsection 3.1.2 and is subject to numerous caveats including the fact that we are not considering the timeframe in which this potential increase in the maternal labour force participation would take place. If we take the timeline of the CWELCC agreement, the federal government intended to create 250,000 new child care spaces between 2021 and 2026. That implies each year 50,000 additional spaces would need to be added. Ignoring the operational constraints outlined in Section 2, that would imply that the expected annual increase in the maternal labour force[42] would be around 1.51 percentage points.

3.1.4 | Estimation of Revenue and Cost of the Proposal

YMCA Canada has referred to the estimates provided by Cleveland (2023) that finds raising the wages of fully qualified ECEs throughout Canada (including Quebec) by 25 per cent, would come at an annual cost of $1.2 billion. Given an annual full-time[43] salary of $32,760 per year for qualified ECEs calculated at the median hourly wage of $21 per hour, this amount is equivalent to hiring 36,630 new ECEs paid the current median wage rate.

On the revenue side, we follow the methodology of Fortin *et al.* (2012) that estimated the potential revenue gains of the increase in female labour force participation in Quebec post-universal child care reform. In their framework, the increase in total employment multiplied by the average productivity of the newly added workers is equated with the increase in total income (and therefore total GDP).

Applying this methodology to our results, we find that increasing the labour force participation rate of mothers with children younger than five years old by 1.51 to 1.68 percentage points[44] per year grows the overall labour force by anywhere between 0.082 to 0.091 percentage points.[45] Assuming that the average productivity of the added workforce is the same as Fortin et al. (2012) estimates for Quebec, 95.6 per cent of the existing workforce, the increase in GDP brought about by the additional expenditure in the ECEC sector is between 0.075 and 0.078 percentage points in a year. Considering the current (as of Q3 2023) Canadian Nominal GDP of $2.89 trillion that amounts to anywhere between $2.25 to $2.48 billion per year.[46]

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41 This is the upper bound of the crowding out because we are assuming that if child care spaces grow, a portion will be taken up by non-employed mothers who did not use child care arrangements (and began joining the workforce as a result) and the remaining portion is taken up by employed mothers who had informal child care arrangements but have switched to formal child care (i.e. the crowding out of informal care). This ignores mothers who use formal child care spaces and choose not to join the workforce. As calculations in the earlier section show this group accounts only for 3.1% of all mothers with children 0-5.

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42 To be specific, only for mothers between 25 to 54 with children under five years old.
43 Assumed to be 30 hours per week.
44 The two estimates of additional labour force participation provided in Subsections 3.1.2 and 3.1.3
45 1,175,100 /21,586,900 × 1.68 = 0.091 percentage points and 1,175,100 /21,586,900 × 1.51 = 0.082 percentage points
46 0.00086×2.89 trillion dollars = 2.48 billion dollars and 0.00078×2.89 trillion dollars = 2.25 billion dollars

> Taking the estimated cost of funding this proposal at $1.2 billion, that means that for every dollar spent on increasing the ECE wages, the increase in labour force participation of mothers can potentially bring between $1.88 (1.88 = 2.25/1.2) and $2.06 (2.06 = 2.48/1.2) in economic benefits each year.

The following list of Canadian studies have found benefit-to-cost ratios that are more or less in line with our estimates:

- Prentice (2007): 1.58
- Fortin et al. (2012): 1.72
- Cleveland and Krashinsky (1998): 2.00
- Peters et al. (2010): 2.00
- Fairholm (2009): 2.42

It is important to note that we have made some critical assumptions to obtain the benefit-to-cost ratio. First, we assumed that without the additional $1.2 billion funding, the desired number of spaces in the CWELCC program could not be created. A natural consequence of this assumption is that all the economic benefits of the policy will only be available if the ECE wages are increased by 25 per cent. We acknowledge that even absent this wage increase (status quo) some additional spaces will be created (and have been created since 2021). Unfortunately, we do not have the means to estimate this counterfactual increase in spaces and labour force supply response of mothers.[47]

Second, we are not accounting for some of the additional monetary benefits of the policy. These include the increase in the working hours of mothers who are currently employed (those who switch from informal care or no child care use to formal care), the reduction in the social benefits paid to families related to child care expenses (e.g. child tax credits) and the increase in disposable income of families who pay lower child care costs (compared to the current rates). Also, while we discuss some of the long-term effects on child development and later-life outcome, we are not able to predict those effects ex ante.[48]

Table 17 summarizes the most important assumptions and results of the report so far:

Table 17- Summary of Key Assumptions and Results

Assumptions	
ECE Wage Increase	25 per cent
Cost of Funding the Wage Increase	$1.2 billion
Number of Additional Spaces Created	250,000 formal child care spaces at not-for-profit child care centres
ECE Labour Supply Elasticity	1.15 (Conservative) and 2 (Baseline)
Average Number of New ECE Graduates	6,350
Maternal Labour Supply Response Channel	Only the extensive margin (Decision to work)
Child-to-Staff Ratio	6 (Conservative) for children 0 to 5 years old
Child-to-Mother Ratio	1.33 (National fertility rate)
Source of Benefits	Only limited to the expansion of centre-based child care centres
Type of Benefits	Economic benefits (GDP)

Results	
ECE Labour Supply Response	58,192 ECEs(Low estimate) 103,746 ECEs (Baseline estimate)
ECE Retention Response	5,632 ECEs
Years Needed to Train New ECEs	4
Maternal Labour Supply Response	7.54 to 8.40 Percentage Points (Over five years) Annual Average increase of 1.51 to 1.68 pp
Economic Benefits	$2.25 to $2.48 billion per year
Benefit-to-Cost Ratio	1.88 to 2.06

Source: CSLS calculations.

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[47] A recent report by CBC that was released after the writing of this report has found that between 2021 and March 2024 around 97,000 spaces have been created. Most of those were in Ontario (41,000). However, the spaces in Ontario have in fact been created since 2019 and the authors of the report were not able to determine how many of these spaces are part of the subsidized national program (CWELCC). https://www.cbc.ca/news/politics/child-care-ten-dollars-day-trudeau-daycare-1.7141421

[48] Considering the total government expenditure to fund the universal child care program ($30 billion over five years or an average of $6 billion annually), the return on investment of the entire program (not just the additional expenditure to increase the ECE wages) would be considerably lower. However, estimating the return of the entire program is not the goal of this report. We also note the numerous caveats to the estimated benefits mentioned in the text (e.g. excluding the intensive margin response of mothers, reduction in benefits paid for child care etc.)

3.2 | Short-run and Long-run Effects on Children Development, Human Capital Formation and Later Life Outcomes

A large body of literature has investigated the effects of child care education programs on the development and future life outcomes of young children. One set of studies has focused primarily on targeted interventions that were aimed at disadvantaged and at-risk children, while others have examined the short-run and long-run effects of universal child care programs. The studies in this literature measure a variety of metrics including cognitive and non-cognitive outcomes, school performance, crime rates, employment, and earnings. This section reviews the main findings of the literature with more emphasis on recent and Canadian evidence (mainly from Quebec).

Starting from Quebec's experience with universal child care, one of the first papers that documented negative short-term behavioural impacts on children enrolling in child care centers in the province was Baker et al. (2008). The authors obtained a negative and significant change in scores for hyperactivity-inattention, general anxiety, separation anxiety, and physical aggressiveness and opposition for children in Quebec compared to the rest of Canada. The Peabody Picture Vocabulary Test (PPVT) score which proxies motor and social development in this study demonstrated a decline as well, but the estimated effect was not statistically significant. Most child health outcomes considered in the study such as the child's health conditions deteriorated. This was especially true for younger children (0- to 4-year-olds). Some of the parenting behaviour and mental health measures also exhibited a significant decline. The estimated effects on "Hostile, ineffective parenting", "Consistency", "Satisfaction with the relationship", mother depression scores and father health measures were all negative and statistically significant.

Taking a longer-term perspective on Quebec's universal child care program, Kottelenberg and Lehrer (2013) show that most of these short-term negative effects documented in Baker et al. (2008) were also present for the more recent cohorts of children in later years and found different impacts based on sex, age and single-parent status of children in subsequent work (Kottelenberg and Lehrer, 2013; Kottelenberg and Lehrer 2018).

Baker et al. (2019) also confirm that these adverse non-cognitive impacts persisted to adolescence for earlier cohorts of children enrolled in Quebec's universal child care system, as measured by higher crime rates, worse self-reported health, and lower life satisfaction and that these findings were more considerable for cohorts with higher child care access.

Concentrating on PPVT test scores for the full sample of children 4 to 5 years old and not yet eligible for school in Quebec 10 years after the implementation of the child care reform Haeck et al. (2015), document negative but generally non-statistically significant impacts. Further, disaggregating the sample by the education level of the mothers, they report more significant and negative effects for children of low-educated mothers.

The authors provide two explanations for these adverse outcomes that are worth highlighting. First, because of the structure of the reform, the Government of Quebec created an incentive for child care centres to offer full-time, full-week spaces and if a space is not occupied full-time the subsidy may be reduced. In practice, most centres exclusively offered full-time full-week spaces. This led to Quebec's children using child care (children enrolling in centre-based care) at a much higher rate than the rest of the country. Second, two major studies on the first years of the program (ISQ, 2004; Japel *et al.*, 2005) showed that the average quality of child care was far from optimal, and it was especially worse for impoverished children. In fact, as Japel et al. (2005) report, more than 20 per cent of children from the lowest-income quartile in child care were in child care of inadequate quality. The comparable statistics for the two upper quartiles was 10 per cent. In addition, about 70 per cent of lower income children in child care centres were in centres of average quality or lower. As Haeck et. al. (2015) elaborate, these disparities could be partly attributed to the rapid implementation of the program and the creation of new spaces that did not coincide with recruiting enough qualified ECEs. As a result, the enforcement of the provincial requirements at the individual child care centre level regarding the educational requirements and the child-to-staff ratios has proven to be challenging.[49]

Examining the long-term effects of the policy in dimensions related to parental outcomes and their interactions with children, Brodeur and Connolly (2013) find that the policy led to a decrease in parents' subjective well-being. The authors attribute this to the "Second Shift" effect, where women work more but are still engaged in household and childrearing activities. However, they found significantly positive effects for low-income families and and parents with educational attainment up to high school, while the estimated effect for middle-income families was negative. Another result of this paper was the estimated heterogeneous effects on satisfaction with work-life balance based on gender. Kottelenberg and Lehrer (2018) found that parents in two-parent households with four-year-old children, who were induced to increase child care use by the policy change, increased their propensity to read to the child daily, while similar parents of children younger than four decreased their daily reading propensity. Molnar (2023) finds evidence that the impact of program eligibility in Quebec reduced the parents' propensity to read to their child daily. However, it did increase reading time at the lower end of the reading distribution by decreasing the propensity to never read to child and increasing the propensity to read once or several times per week.

One of the most recent pieces of evidence to come out of the Quebec reform is the study by Montpetit (2023) which finds that the reform had positively affected reading time, especially for children at the bottom of the reading distribution. Based on the authors' calculations, the proportion of parents reading at least once per week to their child increased by 4.7 percentage points. Also, the share of parents never reading to their child dropped by 6 percentage points. These effects were mainly driven by parents in regions within Quebec that had the highest expansion in universal child care. These results thus suggest that mothers compensated for increased work hours by exerting more effort in parenting when they are home.

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[49] A report conducted by the Office of the Auditor General of Québec available at https://www.vgq.qc.ca/Fichiers/Publications/rapport-annuel/2011-2012-VOR/en_Rapport2011-2012-VOR.pdf found that in 2008-2009, 42 percent of subsidized centres exceeded the maximum ratio of the number of children per qualified ECEs and that figure rose to 54 per cent in 2009-2010.

While the Quebec experiment with universal child care reform has seemingly been slightly to significantly negative depending on the child outcome of interest and the time horizon taken[50], the international evidence regarding the expansion of universal child care and its interaction with children's long-term outcomes is mixed.

In the Norwegian context, Havnes and Mogstad (2011b) studied adults between 30 and 33 years old, who would have been eligible for the universal child care expansion in that country in the 1970s. Relative to the control group, they obtained positive coefficients for the treatment group[51], for the following list of variables: years of education, college attendance, the child being an average earner (as opposed to being a low earner), and the child being single and not a parent later in life. They also found a reduction in the likelihood of dropping out of high school and being on welfare.

Using administrative data from Germany and studying the expansion of a universal child care program aimed at 3 to 6-year-olds in Germany, Cornelissen et al. (2018) discovered substantial variation in the returns to early child care attendance. They specifically report that children of immigrants in Germany are less likely to attend child care early but experience higher returns for school readiness than native-born children. They attribute this result to lower quality of child care provided by informal child care arrangements. Therefore, in the words of the authors, "formal child care acts as an equalizer".

More broadly, and in a relatively recent survey of the literature, Dietrichson et al. (2020) review 26 studies using natural experiments to understand the effects of universal preschool programs for the general population of children. In the studies that they investigate, the results related to test scores and school achievements and school grades are mixed, from significantly beneficial effects to significantly harmful ones. However, most studies reporting differences over Socio-Economic Status (SES) find more beneficial/less harmful effects for children from families with low SES. In terms of future educational attainment of children, there seems to be almost a consensus in improvements on either year of schooling or the highest grade completed. Most of these studies report higher gains for low SES children, with only one study finding the same effect for children with highly educated mothers. Lastly, on measures related to earnings, employment, and being on welfare, measured at ages from 23 to 59 years, most studies find beneficial and statistically significant effects for the general population of children with substantial variation underlying the average effect.

Gray-Lobe *et al*. (2022) use admissions lotteries to estimate the effects of large-scale public preschool in Boston and conclude that preschool enrollment increases the propensity of college attendance, SAT test-taking and high school graduation. The authors also find evidence that participation in the program decreases adverse social outcomes such as juvenile incarceration but has no detectable impact on state achievement test scores. This study also uncovers gender differences for these gains and found them to be greater for boys than for girls.

While it is certainly difficult to summarize the findings of this vast and evolving literature, the following points can be made regarding the short-term and long-term outcomes of universal child care programs:

- The structure of the program matters. The eligibility criteria (means tested vs universal, eligibility based on a mother's employment status, children's eligibility age, full-time vs part-time care) can play an important role in shaping children and parental outcomes (e.g. labour supply response of mothers, child care use, long-term developmental outcomes of children etc.). In addition, other forms of government transfers can reinforce a universal child care system. For instance, Milligan and Stabile (2011) find that child benefit programs in Canada had significant positive effects on test scores and several measures of both child and maternal mental health and well-being that show embarked improvement with higher child benefits.[52]

- Having an adequate number of well-trained and motivated qualified staff is vital to the success of universal programs. One major issue with the Quebec experiment was that the rollout of new spaces severely lagged the increase in demand for low-fee spaces, in part because of the lack of qualified ECEs. To address these shortcomings, the government of Quebec had to resort to hiring educators with lower qualifications which, to some extent, can explain the negative observed outcomes for the enrolled children years later.

- The existing non-parental child care arrangements in Canada and the degree to which formal regulated care can represent an improvement over them (i.e. the magnitude of the crowding-out effect) not only influences the contemporaneous effects in terms of child care use and maternal labour supply, but it will also have long-term consequences for the effectiveness of the program and children's development.

- Disadvantaged children seem to be the main beneficiaries of an expansion in access to subsidized child care spaces. This finding has been robust to the outcomes studied, time horizon (short-term vs long-term) considered and location. To the extent that equity and closing socioeconomic gaps is a priority, ensuring equal access to affordable child care spaces can be of great benefit.

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[50] It is worth mentioning that the expansion of child care spaces in Quebec was driven both by the for-profit (funded by a tax credit) and not-for-profit (directly funded by government subsidies) centres. On average, for-profit centres seem to offer lower quality of care. Therefore, these negative outcomes may partly be attributable to an increase in the for-profit spaces. A more detailed discussion about this issue is presented in section 3.3.

[51] To define the treatment and comparison group, the authors order municipalities based on the increase in child care coverage rates from 1976 to 1979 and then separate the sample at the median. Those regions in the upper half (above median) of expansion constituted the treatment municipalities and the ones in the lower half were the comparison group.

[52] The authors also report interesting differences in the effects of benefits by sex of the child. Benefits could have stronger effects on educational outcomes and physical health for boys, and on mental health outcomes for girls.

3.3 | Quality of Care

Lack of high-quality child care and education represents a great risk to the development of children realizing their full potential in later stages of their life and would deepen the socio-economic inequalities. The potential negative consequences include poor social, emotional, educational, health, economic and behavioural outcomes which are more acute for disadvantaged children. However, defining what quality of care is in the context of early learning and child care is not a simple task and there are multiple angles from which one can evaluate the quality of child care services. Katz (1992) suggests four different perspectives for measuring ECEC quality:

- *Top-down:* examines quality by focusing on selected characteristics of the program and environment, usually evaluated by an assessor.
- *Bottom-up:* focuses on children's experience of the program. This method is particularly suitable for evaluating the quality of child care services provided to children with special needs (Spiker, Hebbeler, & Barton, 2011).
- *Inside:* defines quality as perceived by the staff including along the dimensions of collegial relationships, staff-parent relationships, and staff-sponsor relationships.
- *Outside-inside:* highlights the parent-teacher relationship and evaluates whether the parents' expectations or pedagogical goals are compatible with the curriculum.

The most common approach to measuring the quality of ECEC programs is the top-down perspective. This perspective encompasses broad parameters of program and state policies (distal features) and curriculum and caregiver-child interactions (proximal) features of an ECEC program. Clifford, Reszka, & Rossbach (2010) explain a common disaggregation of the multidimensional ECEC quality into two related components: (1) structural quality - structural indicators such as staff-to-child ratios and caregiver characteristics such as teacher formal education; and (2) *process quality* - including learning opportunities available to the children, and teacher-child and peer-to-peer interactions within the child care environment. Both components share the same objective of improving the development opportunities of children and enhancing their early learning outcomes.

Increasing the wages of qualified ECEs by 25 per cent has the potential to increase both structural and process quality components through the following mechanisms:

- Higher compensation attracts more qualified ECEs and increases the share of qualified educators (or put differently, it raises the average educational attainment of ECEs). In a meta-analysis, Manning (2017) examines the correlation between teacher qualifications and the quality of early childhood learning environments by reviewing the findings from 48 studies with 82 independent samples.[53] Overall, the results of the meta-analysis show that higher teacher qualifications are significantly correlated with higher quality early childhood education as measured by the environment rating scale and subscale ratings including program structure, language, and reasoning.

- As described in Section 1, raising ECE wages reduces the turnover of educators in the sector. Totenhagen et al. (2016) note several studies that obtain a positive relationship between wages and reduced ECE turnover. Reducing turnover can potentially increase the quality of care and education provided to children. According to the attachment theory, young children's attachment security and positive interactions with an ECE can also positively influence their development, just as secure maternal relationships would. Teacher turnover can disrupt these relationships which may negatively affect the process quality components such as children's cognitive and social-emotional development (Cryer et al., 2005) and executive functioning skills (Graziano et al., 2016). In addition, as Bryant et al. (2023) discuss, ECE turnover can cause families to face difficulty in developing a positive relationship with the new educator and it could also affect the staff who remain by disrupting schedules and teamwork. Finally, turnover creates additional costs and administrative burdens for ECE centres.

- Hiring more staff induced by higher wages increases the pool of available ECEs and would allow child care centres to keep meeting the staff-to-children ratios requirements and even exceed these minimum thresholds to offer higher quality of service. Blau (2000) found that a higher staff–to-child ratio appears to have beneficial effects on child care quality when unobserved differences across centers are not accounted for. However, these effects become much smaller when he accounts for these unobserved differences.[54]

- Raising the wages of ECEs may lead to improvements in job satisfaction and the commitment of ECEs to educating young children. Stremmel et al. (1993) surveyed 544 early childhood staff to examine the relationship between job satisfaction (which included compensation), communication, age, specialized training, and length of employment with emotional exhaustion. The results suggest that while salary is an issue, low salary alone does not fully explain the emotional exhaustion of ECEs.

- As discussed in Section 3, expanded child care spaces forthcoming from raising ECE wages would crowd out some of the informal care arrangements that mothers utilize absent sufficient affordable child care spaces. To the extent that these informal arrangements are of lower quality, the expansion of formal child care spaces increase the quality of early education through a compositional effect.

In addition, the type of child care spaces created can play an important role in the quality of child care services provided. Cleveland and Krachinsky (2004) show that the quality of care is superior in not-for-profit centres compared to for-profit centres. This was mainly a result of the lower child-to-staff ratios, more trained staff and more professional development opportunities for staff – than in for-profit centres. On top of that, not-for-profit centres offer higher wages and better working conditions. In a study comparing not-for-profit and for-profit child care in

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[53] Studies included children from pre-kindergarten and kindergarteners prior to elementary/primary school and centre-based providers from various countries.

[54] Blau's (2000) measure of quality contains 32 items characterizing personal care routines, furnishings, language-reasoning experience, fine and gross motor activities, creative activities, and social development.

Canada, Cleveland et al. (2007) analyzed four Canadian datasets and found the "non-profit child care centres have frequently been found to be, on average, of better quality than for-profit."

3.4 | Fertility and Birth rates

In this subsection. we briefly review the literature that has investigated the links between the availability of affordable child care and fertility both for first-time parents and for parents deciding to have more than one child. This allows us to put into context the degree to which increasing birth rates in Canada could be a possibility through an expansion of child care spaces.

In a recent literature review, Scherer et al. (2023) re-examine the international evidence to study the link between child care accessibility and fertility. As the authors mention, the cross-country studies conducted in the early 2000s did not discover strong association between fertility and child care availability (Gauthier, 2007; Sleebos, 2003; Thévenon, 2009; Thévenon & Gauthier, 2011). Studies that focus on single countries have found mixed results as well. For example, Bauernschuster et al. (2015) investigated the major German child care reform and discovered that increases in public child care have significant positive effects on fertility. They further find that the fertility effects are more pronounced at the intensive than at the extensive margin (i.e. inducing parents to have additional children as opposed to becoming parents for the first time) and are not driven by changes in the timing of births or selective migration.[55] Specifically, the results of this study suggest that increasing formal child care coverage for children by 10 percentage points leads to an increase in the birth rate in year (current year when women are eligible for universal child care) by 2.7 per cent of the sample mean and 2.8 per cent of the sample mean in year t+1 (one year after eligibility).

In the UK, Schaffnit and Sear (2017) identify a negative association between the use of paid child care and the transition to a second child across various socio-economic backgrounds. This result may be driven by a selection mechanism (higher income mothers being more likely to use paid child care and less likely to have more than one child). It is also likely that mothers who use paid child care have stronger labour force attachment (particularly because they are also shown to be more educated and have higher income in the study) and are therefore less likely to have additional children.

Scherer *et al*. (2023) obtained evidence for limited positive effects of formal child care services on fertility in Italy. The authors find a statistically significant and positive association between the lagged increase in public regional child care usage and the likelihood of having one or more children for specific age groups.[56] However they, conclude that their results do not support "strong claims about a generalized positive effect of child care on the transition to parenthood or higher-parity births can thus be made for the Italian context".

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[55] i.e. families intentionally migrating within the country in order to be eligible for child benefits.
[56] As the authors explain, a 0.3 per cent increase in the probability of having a first child for women aged 20–29, and smaller effects observed among men aged 45–49, and for the second child for women aged 45–49.

Outside of Europe, the studies in Japan and the United States also do not obtain significant causal estimates for the increase in child care spaces on fertility. In Japan, Fukai (2017) finds a positive effect of child care availability on birth rates but only limited to women who live in regions with high female labour force participation. However, Lee and Lee (2014) and Nakajima and Tanaka (2014) do not find any strong evidence supporting these findings in Japan. In the United States, Blau and Robins (1989) established a negative association between child care costs and fertility for women outside of the labour force, but did not uncover any such significant relationship between child care subsidies on fertility timing for employed women.

Based on the inconclusive findings of this literature, we cannot confidently forecast what the actual impact of the expansion of child care spaces could be on the birth rates of Canadian women. We hope that more studies research this very important topic in future, especially in country like Canada where both persistent declining birth rates and expansion of universal child care coverage are coinciding.

■ 4 | Conclusion

Given the federal government's commitment to providing universal and affordable child care through the CWELCC agreements, and in the aftermath of pandemic-related labour shortages in the sector, YMCA Canada proposed raising the wages of qualified ECEs by 25 per cent. In this study, we examined this proposal by reviewing the state of the child care sector in Canada and paid particular attention to the link between ECE compensation and the labour supply in this market. The findings obtained from literature that have studied the labour supply of ECEs indicate that this labour supply is elastic. Therefore, raising ECE pay can induce a significant labour supply increase in the sector, both on the intensive and extensive margins. We consider a range of labour supply responses based on the reported elasticities in the literature and find that even under the most pessimistic scenario, the proposal will *theoretically* be able to attract enough ECEs to staff the desired number of additional spaces outlined in CWELCC framework.

However, it is worth noting that there are numerous operational challenges and constraints that will also need to be addressed to implement the Canada-wide universal child care program. First, the post-secondary education system in Canada will need to markedly increase its capacity to graduate new ECEs. This may be achieved by colleges and universities as well as different layers of government working in tandem to expand the capacity of ECE programs offered at these educational institutions (i.e. increase the supply of ECE training). On top of that, more needs to be done to attract more students into this field. Certainly, raising the wages paid to qualified ECEs will be beneficial in this respect. However, as Lue and Davey (2022) discuss in detail, other important factors such as enhanced career opportunities, more generous benefits and compensation packages and greater social recognition play a major role.

Federal and provincial governments can positively contribute to the increase in the supply of ECEs in more innovative ways. One possibility is to create pathways for immigrants with formal ECE training to join the labour force and help alleviate the shortages in this sector. British Columbia's Provincial Nominee Program (BC PNP) skills immigration program is a good example. By allowing graduates of ECE programs to apply for permanent residency, the province encourages international students to stay in the province and join its ECE workforce. In addition, this has the potential to incentivize more international students to apply for ECE programs in the first place and increase the pool of ECEs in Canada. Lastly, as discussed in Section 1, this sector is heavily women-dominated (96 per cent). Another possible way to increase the supply of labour in child care is to promote greater participation of men in this field as advocated by Reeves (2022).

The report then turns to estimating the return on investment for the additional public expenditure required to raise the wages of ECEs. At an estimated price tag of $1.2 billion, the proposal adds extra cost to a program that is seemingly quite costly (the estimated cost for the Canada-wide early learning program is around $30 billion over 5 years). We first start by estimating the potential increase in the mother's labour force participation if the additional 250,000 spaces promised by the federal government are fully staffed by qualified ECEs. We find that if the results of Quebec's child care program carry over to the rest of Canada, the labour force participation rate of mothers with children aged 1 to 4 can increase by an annual average of 1.68 percentage points or 8.40 percentage points over the implementation of the program. Alternatively, an analysis of the potential uptake of child care for mothers 25 to 54-year-old with young children in Canada shows that their labour force participation can increase by an annual average 1.51 percentage points or 7.54 percentage points over the duration of the program's phase-in period.

Using Fortin et al. (2012) methodology, we estimate the total economic returns caused by the increase in maternal labour force participation channel which is estimated to generate an additional 110,978 jobs over the program's implementation. The estimated annual economic returns are between 1.88 dollars to 2.06 dollars for each dollar spent on expanding child care spaces through raising ECE wages. We acknowledge that these estimates are likely upper bounds of these returns as we had to ignore some key practical issues such as capital costs required for the expansion of child care spaces and the bottleneck of qualified ECE labour supply created at the post-secondary education system. However, this study demonstrates that there are considerable unrealized social gains (even within a relatively short time frame) that can be made by investing in the supply of child care.

We finally provide an assessment of the long-run social benefits of higher ECE pay based on Canadian and international evidence along multiple dimensions including children's development, human capital formation and later life outcomes; quality of care; fertility and birth rates. The evidence on child development and human capital formation highlights the importance of the child care program design and demonstrates that there can be some concerns about a universal child care program, particularly if the program is suffering from a lack of qualified staff and is not flexible enough to accommodate children and parents with special needs. However, in almost all studies, children (particularly those from disadvantaged

backgrounds) who were able to obtain access to low-fee spaces benefited considerably in terms of these developmental outcomes. This highlights the essential role that equality of access plays in shaping the outcomes desired in the context of child development. We also find evidence that shows that quality of care can remarkably improve because of the increase in the qualifications of ECEs and higher retention rates that raising the ECE wages can bring. Lastly, the evidence for fertility and birth rate improvements was mixed. Thus, we are not able to predict as to what the effects (if any) on fertility and birth rates attributable to additional investment in the ECEC sector will be and call for further studies on this very interesting topic.

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■ Appendix A: Comprehensive Literature Review of the Labour Supply Elasticity of ECEs

Blau (1993) was the first to document the labour supply elasticity of ECEs using samples of female child care workers , other female workers,[57] and female non-workers from the March Current Population Surveys (CPS) in the United States for 1977-87. Using a structural joint model of sector choice and hours of work, the author estimates that a 1 per cent increase in the wages[58] of ECEs increases the probability of women joining the ECEC sector by 0.83 per cent without controlling for state dummies and 1.20 using state dummies controls.[59] This can be interpreted as the *extensive margin*[60] of the elasticity of labour supply. In terms of total hours of work in the ECEC sector, a 1 per cent increase in the wage rate, increases the total annual hours of work by 0.313 per cent without controlling for differences between U.S. states and 0.714 per cent using state controls. This provides a range for the *intensive margin* of the elasticity of labour supply. This means that the *overall* elasticity of ECE's labour supply is between 1.15 and 1.94.

In a subsequent paper, Blau (2001) extends the observation period to 1998 and finds an elasticity of 0.73 for the extensive margin of labour supply and an elasticity of 0.42 for the intensive margin (hours of child care work), corresponding to an overall labour supply elasticity of 1.15.

While not providing elasticity estimates, a Canadian study by Fairholm and Davis (2014) found that from 2001 to 2008, total employment in the 'Child Day-Care Services' industry increased by 36.8 per cent compared with an increase of 15.0 per cent in total industrial employment while average weekly earnings (including overtime) for all employees in the ECEC sector rose by 21.4 per cent.

More recently, Garcia-Vazquez (2023) used an instrumental variables approach to estimate the labour supply elasticities of lead teachers and child care workers in the U.S.[61] Utilizing lagged fertility rates (a 2-year lag) at the state level as an instrument for the ECE labour supply shifters, he finds an extensive margin elasticity of 1.33 for Lead teachers and 1.58 for Childcare workers.

In another very recent contribution, Cunha, and Lee (2023) use the Texas Education Research Center (ERC) database which provides longitudinal and student-level data from 1994 to the present to estimate a dynamic discrete-choice model of schooling, labour supply and home production. Their main parameters of interest are the elasticities of labour supply and turnover for ECEs. The authors use their model estimates to evaluate policies that provide bonuses for ECEs representing 1 per cent to 50 per cent of their labour income[62] and find that a 25 per cent earnings bonus that would cause a 50 per cent increase in employment in the ECEC sector. This elasticity accelerates as the relative magnitude of the bonus increases. Therefore, as Figure 1 shows the increase in ECE employment function (as a function of the increase in bonus pay) is convex and in fact it doubles before the increase in bonus reaches the 50 per cent threshold. This is a very key finding because it implies that the overall elasticity of labour supply in the ECEC sector is not constant and could vary based on the wage increases in the ECEC sector relative to other sectors. Figure 2 depicts the relationship between the elasticity of labour supply with respect to earnings and the per cent increase in the earnings of ECEs.

Another intriguing feature of the model developed in this paper is that it allows the authors to investigate the different schemes of wage supplementation and estimate the composition of the workers that will be attracted to the ECEC sector by each scheme. They simulated two policies that reflect the wage supplementation programs implemented in Virginia and Texas.[63] The first policy is to offer a static $1,500 bonus[64] to ECEs in every period, similar to a signing bonus. The second one is $1,500 bonus conditional on having worked in the ECEC sector in the previous period (year), akin to a retention award.

The static bonus substantially impacts recruitment into the ECEC sector as it increases the share of ECEs who work in the sector for at least three months, by about 14%. In contrast, the dynamic bonus has negligible effects on recruitment. These two policies also attract a different composition of movers. As Table A1 shows, the static bonus attracts more workers who would be in the Health and Education (HE)[65] sector without this intervention. However, the dynamic bonus attracts workers from all industries uniformly.

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[57] All female child care workers between the ages of 18 and 64 (inclusive) and a random subsample of all other women in the same age range. The final sample consisted of 4,305 child care workers, 7,180 other workers, and 3,710 non-workers.

[58] To be clear, in this framework, the wage rate that woman j could earn in sector i, i = 2 (Childcare), 3(Other sectors), is Wij= ϖi * tij   where ϖ is the skill price and t is skill endowment. The elasticities reported in this paper are with respect to skill price ϖ.

[59] The state controls can potentially capture some of legal differences between states especially as it related to the ECEC sector.

[60] The extensive margin refers to the decision of women joining the ECEC sector, either from other sectors or from non-employment, in response to increases in the ECEs wages while the intensive margin means adjustment of working hours of the existing ECEs in response to the said wage increases.

[61] "The primary function of lead teachers is to work with parents, administrators, and other teachers to improve students' experience and meet teaching objectives. Additionally, lead teachers plan, evaluate, and improve the physical environment of the classroom to create opportunities that meet the changing needs of the developing child. Lead teachers can work at a preschool, child care center or elementary school."- https://www.glassdoor.ca/employers/Job-Descriptions/Lead-Teacher

[62] The bonuses they consider are static in the sense that they do not incorporate these increases to future wage increases. This means that an individual choosing in period t whether to work in the ECEC Sector incorporates the bonus in their decision making, but does consider that the bonus will also occur in periods a + 1, . . ., A.

[63] In 2019, Virginia was awarded a federal Preschool Development Birth through Five Initial Grant (PDG) and the state began a set of efforts to increase access to stable, affordable, and high-quality ECE. The program in Virginia was uniform across the state. In Texas, these programs were initiated by the State using funds allocated by the Child Care and Development Block Grant (CCDBG) Act of 2014. The State requested each region to develop a wage supplementation plan for ECEs with values ranging from $120 to $3,900 bonuses per staff per year. These bonuses represent between 0.5 per cent and 15.6 per cent of the yearly earnings of child care programs reported by the Bureau of Labor Statistics.

[64] This amount is 17 per cent of the ECE wages in the sample that Cunha and Lee (2023) use.

[65] As ECEs are part of the HE sectors, these would be workers in the HE sector who are not employed working as ECEs.

Table A1: The Effects of Different Bonus Schemes on Attracting Educators from Various Sources

Sector in Baseline	Static $1,500 Bonus	Dynamic $1,500 Bonus
Others	19.3%	30.1%
HE	54.9%	23.1%
School	20.7%	22.4%
Home	5.1%	24.4%

Note: "This table shows which sectors individuals would be in the absence of counterfactual wage supplementation programs. The per centages denote which sector they come from due to the policy."
Source: Cunha and Lee (2023)- Table 11

## Turnover Elasticity with Respect to Wages

The authors are also able to estimate the elasticity of turnover within this framework. Figure 3 below illustrates the changes in the turnover with wage increases. The turnover elasticity is reasonably constant and around 0.5, which makes it inelastic. This implies that for example, a 20 per cent increase in earnings reduces turnover by 10 per cent. In addition, this elasticity does not change with age.

Table A1: The Effects of Different Bonus Schemes on Attracting Educators from Various Sources
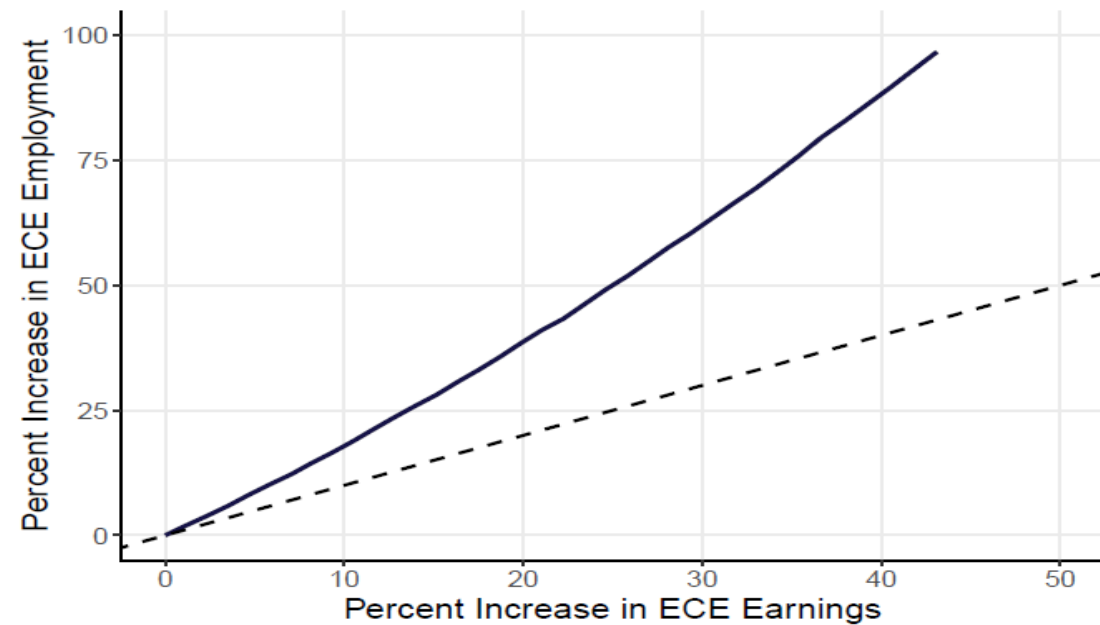
Note: The dashed line represents the 45 degrees line
Source: Cunha and Lee (2023)- Figure 6

Figure 3:The Relationship between the Elasticity of Labour Supply and the per cent Increase in the ECE Earnings
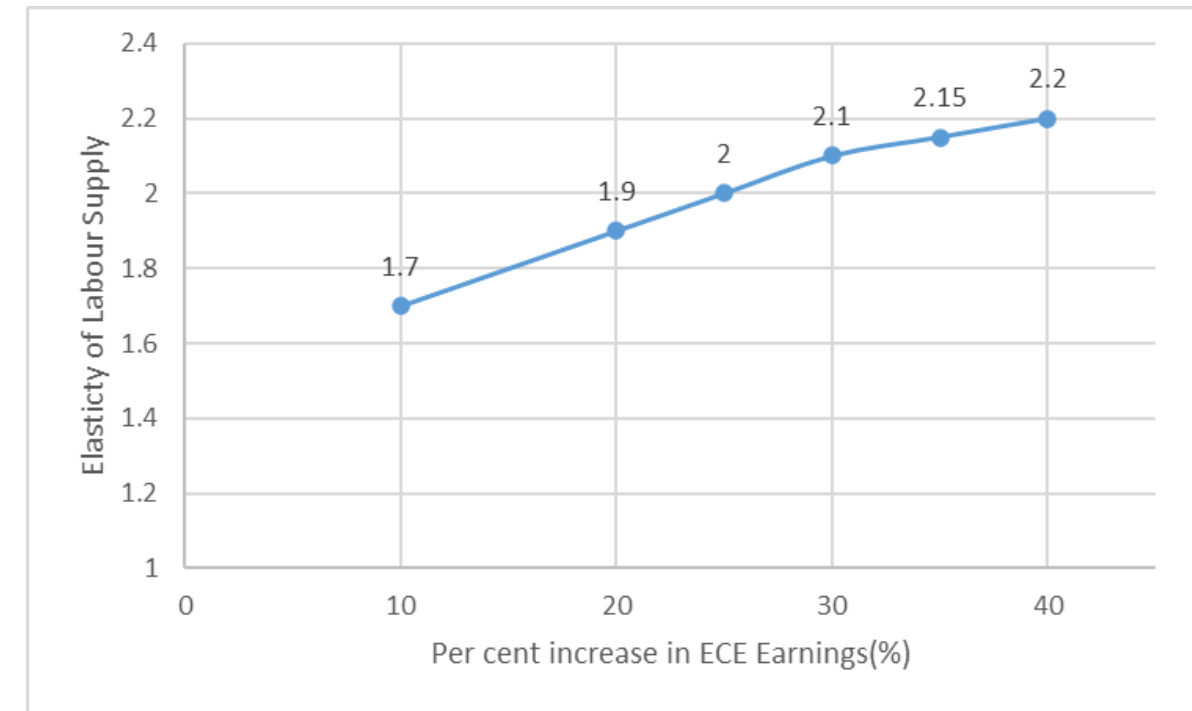
Source: Author's calculations based on Figure 1

Figure 3: Impact of an Increase in ECE Earnings on Turnover

Note: The upper dashed line represents the 45 degrees line
Source: Cunha and Lee (2023)- Figure 7

The paper also reports the impact on turnover and duration of employment of ECEs under each wage supplementation scheme. Table A2 summarizes the results.

Table A1: The Impact of Different Bonus Pay Schemes on Duration of Employment, Turnover and Accumulated experience of ECEs

	Baseline Value	**Static $1,500 Bonus (% Change)**	**Conditional $1,500 Bonus (% Change)**
Duration at first spell	1.95	6.12%	7.97%
Turnover at first spell	0.47	-6.82%	-8.18%
Accumulated Experience in the ECE Sector	1.86	6.75%	8.22%

Note: The "Baseline" column shows the same statistics implied by the model with no policy. The second column shows the per cent change in overall composition after a static $1,500 bonus, the third column shows the per cent change in composition after a conditional $1,500 bonus. Duration is calculated as the number of consecutive years in a sector, and turnover is the fraction of individuals who leave the ECEC sector at the end of the period. Accumulated experience is the number of periods that the individual worked (consecutively or not) in the ECEC sector by age twenty-nine years.
Source: Cunha and Lee (2023)- Table 12

Focusing on turnover, the elasticity is approximately -0.48 under the conditional (dynamic) scheme. This estimate is 23 times smaller than the elasticity obtained by Bassok et al. (2021) who report a turnover elasticity of -11.2 in their Randomized Controlled Trial study to assess the impact of the 2019 program. Implemented in Virginia that offered up to a $1,500 compensation bonus (representing an increase of 4.4 per cent) if educators in early childhood settings remained in their position over 8 months, on turnover.[66]

In a related paper, Akai and Jibiki (2021) use data from the 2013 and 2018 Survey of Licensed Childcare Providers in Tokyo to study the effects of the gradual increase in the subsidies to private child care providers to estimate the impact of hourly wages on intention to leave the sector. The increase in subsidy was conditional on the experience of child care teachers in each provider and excluded public providers. Using a difference-in-difference strategy, the authors find that the policy increased teachers' wages by 7 per cent and reduced intention to leave by 19 per cent. To the extent that intention to leave represents actual turnover within a year, this result suggests a turnover elasticity of 2.7.[67]

As the last study examined in this literature review, Browsky et al. (2022) propose an equilibrium model of the impact of increased public investment in early childhood education and within their model they choose a labour supply elasticity of 4 for ECEs without a bachelor's degree and 2 for ECE's with such a degree. In driving their elasticities, they reviewed the labour supply elasticity estimates provided in the K-12 schooling, firm-specific labour supply, and on heterogeneous labour supply elasticities literature and obtained relevant elasticities ranging from 1 to 10, and with lower-skill occupations and better-identified studies showing higher elasticities. Some of the papers examined include Rothstein (2015) which develops a model of K-12 teacher labour supply and assumes labour supply elasticity of 0.5 to 1.5 at the occupation level, Ransom and Sims (2010) who report firm labour supply elasticities of about 1.8 at the school district level and Webber (2016) who estimates an average firm labour supply elasticity of 0.9 for women in the educational services industry. Also noted in their literature review is the meta-analysis of Sokolova and Sorensen (2021) who obtained a firm-specific labour supply elasticity estimate of 6.0 for women in all sectors and Azar et al. (2019) paper that finds an implied market-level labour supply elasticity of about 0.6 with low skill occupations having higher market-level elasticities than high skill occupations.

■ Appendix B: International Evidence on the Labour Supply Response of Mothers to Child care Coverage Expansion

Havnes and Mogstad (2011a) analyze a staged expansion of subsidized child care in Norway starting in 1970s and obtain 0.0625 percentage point increase in mother's employment rate area and 0.052 percentage points increase in mothers working full-time stemming from 1 percentage point increase in child care coverage in the treatment area relative to the comparison areas.[68]

However, as discussed in Haeck et al. (2015), one must consider the differences between the Norwegian reform and the policy implemented in Quebec. In Norway, only a limited number of spaces were offered in the period investigate by Havnes and Mogstad (2011a) therefore leading to excess demand. In addition, the policy did not cover children younger than 3 years old, and the fees remained relatively high compared to the heavily subsidized child care network introduced in Quebec. Their argument is somewhat supported by Hardoy and Schone (2015) study that concerns the more recent public policy changes in Norway that decreased price variations among municipalities and increased child care coverage for the children between 1–5-year-olds. The study found documented an increase in maternal labour market participation rate of mother (by 4 percentage points approximately).

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[66] Cunha and Lee (2023) attributed this disparity to the compositional differences between the older and more educated sample of Lead and assistant teachers considered in Bassock et al. (2021), and their younger, less educated sample of all ECE workers in Texas.
[67] It is also possible that the intention to leave does not translate into turnover from one period to the next.

[68] To define the treatment and comparison groups, Havnes and Mogstad (2011a) order the municipalities according to the percentage point increase in child care coverage rates from 1976 to 1979. They then separate the sample at the median, letting the upper half constitute the treatment municipalities and the lower half the comparison municipalities.

In the U.S. context, Fitzpatrick (2010) and Cascio and Schanzenbach (2013) analysed the impact of pre-kindergarten programs similar to the Quebec policy reform and found small to null effects on maternal labour force. Notwithstanding, these programs only affected children aged 4 years old and the number of hours in care could not exceed 6 hours per day, compared to 12 hours per day in the Quebec.

Studying a comprehensive child care reform in Germany, Bauernschuster and Schlotter (2015) examined a German policy that legally entitled children aged 3–6 years old to a space in kindergarten. They found that the reform led to a 14.1 per cent increase in maternal employment and a 23.2 per cent increase in working hours. These substantial employment effects to the were seemingly generate by the lack of private and informal child care arrangements (absence of crowding-out) prior to the reform and the fact that children between 3-6 years old were legally entitled to public child care.

In similar studies Nollenberger and Rodrguez-Planas (2015) – in Spain—and Brilli et al. (2013) – Italy—estimate significant employment gains by mothers because of universal child care reforms. The Spanish policy extended formal child care to 3-year-olds caused a 9.6 per cent increase in the average employment of mothers. More relevant to the CWELLC framework, Brilli et al. (2013) estimated the impact of child care availability on maternal employment to be 1.3 percentage change increase for 1 in public child care coverage.
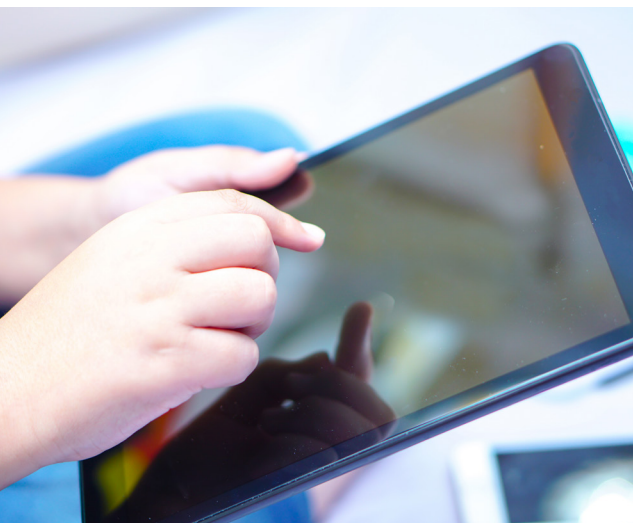
■ Appendix C: Child Care Providers Data at the Provincial level

Table 1C: The Educational Requirements at Individual Staff and Program Levels for Regulated Child Care Centres, by Province

P/T	Full-day child care centres			Kindergarten
	Director/supervisor/administrator	*Individual staff person*	*Program level*	*Kindergarten teacher*
NL	2-year ECE diploma	An orientation course, and proof of registration in an ECE program	1 staff member in every homeroom must have a 1-year ECE certificate. All staff in infant rooms must have a 1-year certificate	Post-secondary ECE qualifications not required
PE	*Early childhood supervisor:* 2-year ECE diploma or a degree in child and family studies *Early childhood director:* ECE degree; degree in child and family studies; or a degree related to ECE and 1-year ECE certificate	30-hour course in each of the following areas: child growth and development, child guidance and early childhood pedagogy.	1 staff member in every early childhood centre must have a 1-year ECE certificate.	*Kindergarten:* Primary/elementary concentration (K-6) *Pre-kindergarten:* 2-year ECE diploma
NS	2-year ECE diploma[1]	Orientation for Staff Working in Licensed Child Care Facilities or post-secondary courses in early childhood education equivalent to the Orientation	2/3 of staff must complete post-secondary coursework in three approved subject areas or have a 1-year ECE certificate or a 2-year ECE diploma.	*Grade Primary:* Post-secondary ECE qualifications not required *Pre-Primary:* 2-year ECE diploma
NB	1-year ECE certificate or 90-hour Introduction to ECE course	No minimum training or education requirements	1/2 of staff must have a 1-year ECE certificate[2]	Post-secondary ECE qualifications not required.
QC	Post-secondary ECE qualifications not required	No minimum training or education requirements	2/3 of staff must have a 3-year ECE diploma or equivalent	*Maternelle 5 ans:* A 4-year B. Ed. in kindergarten and elementary education *Maternelle 4 ans:* A full-time licensed teacher and a qualified educational professional specialized in the development of preschool children who is there for half the day

1 A centre director who began working as a director before May 1, 2012 is only required to complete some post-secondary coursework.

2 Before July 1, 2020, 25% of staff or the centre administrator must hold a 1-year ECE certificate.

P/T				
ON	2-year ECE diploma	No minimum training or education requirements	Proportion of certified staff varies by age group, the lowest being 1/3 of staff caring for infants and toddlers must have a 2-year ECE diploma.	A team of a teacher, for whom PSE ECE qualifications are not required, and a Registered Early Childhood Educator is required
MB	Approved post-diploma specialization or recognized degree	40 hours of approved early childhood training within the first year of employment	2/3 of staff per centre and 1 staff person per group must have a 2-year ECE diploma.	Post-secondary ECE qualifications not required
SK	*Supervisor:* A post-secondary ECE orientation course or three ECE courses in approved areas *Director:* 2 year ECE diploma or equivalent coursework	For staff working 65 hours/month or more: A post-secondary ECE orientation course or three ECE courses in approved areas	20% of staff must have a 2-year ECE diploma or equivalent coursework and an additional 30% a 1-year ECE certificate or equivalent coursework.	Post-secondary ECE qualifications not required but preferred
AB	2-year ECE diploma or equivalent	45-hour post-secondary course or 54 hour orientation course or equivalent within six months of employment	1/3 of staff must have a 1-year ECE certificate	Post-secondary ECE qualifications not required
BC	Not specified	One post-secondary ECE course	1 staff per group must have a 1-year ECE certificate In infant-toddler programs, 1 staff per group must have a post-basic Infant Toddler certificate and 1 staff must have a 1-year certificate	Post-secondary ECE qualifications not required. In Seamless Day programs a team of a teacher and a certified ECE is required.
YT	No minimum PSE requirements	60 hours of coursework in early childhood development, or equivalent	20% of staff must have a 2-year ECE diploma and an additional 30% a 1-year ECE certificate.	Post-secondary ECE qualifications not required
NT	Post-secondary ECE certificate	No minimum training or education requirements	50% of staff must have a post-secondary ECE certificate.	*Kindergarten:* Post-secondary ECE qualifications not required *Junior kindergarten:* 2-year ECE diploma accepted

Source: Early Childhood Education and Care in Canada 2021-Beach et al. (2023)

Table 2C depicts the historical evolution of regulated child care centres across various provinces. The most notable trend observable in this table is the rapid and persistent growth of child care centres is Quebec relative to other provinces and the slow increase (and even stagnation) of such spaces in other provinces from 2004 to 2021. This disparity is certainly linked to the universal low-fee child care reform that was enacted in Quebec in 1997. Table 3C shows the same evolution for the regulated home-based centres. While regulated child care centres have overall increased in numbers. Across Canada, the number of regulated home-based centres has fallen significantly across the country between 2004 to 2021.

To provide more context about the relative composition of centres, Appendix C, Table 4C shows the number and percentage of centres within each province that were for-profit between 2004-2021 for regulated part- and full-day centre spaces (not centres) for 0-12-year-olds.

Table 2C: Total Number of Regulated Child Care Centres. Provinces/Territories/Canada (2004 – 2021)

P/T	2004	2006	2007	2008	2010	2012	2014	2016	2019	2021
NL	151	165	167	172	172	192	192	205	189	186
PE	142	131	136	144	143	102	115	119	144	150
NS	382	383	386	380	409	332	390	363	359	304
NB	357	361	384	415	491	542	605	627	673	697
QC	996	1918	1986	2020	2215	2612	2997	3249	3563	3578
ON	3874	4175	4480	4582	4803	4922	4361	5276	5523	5506
MB	567	574	583	595	635	640	666	689	713	718
SK	153	173	179	187	222	259	282	310	335	346
AB	1701	1681	1699	1739	1974	2178	2276	2402	2789	2,120 *(est.)*
BC[1]	3133	2933	3095	3280	2792	2864	2963	2932	3099	3283
YT	37	41	34	32	39	35	36	36	40	49
NT	49	51	67	67	59	59	56	64	62	68
NU	46	45	43	45	47	52	54	48	53	60
CA	11588	12631	13239	13658	14001	14789	14993	16320	17542	17065

Note: Included in child care centres are all regulated centre-based facilities—full-day, part-day and before-and after-school child care but not family child care. In BC, the number of centres is less than the sum of individual program categories as facilities may be licensed for more than one type of program. The total number of centres reported in 2004 – 2008 was the sum of the individual program categories and is not comparable to the 2010 – 2021 numbers. Source: Early Childhood Education and Care in Canada 2021-Beach et al. (2023)

Table 3C: Total Number of Active Regulated Home-based Child Care Centres. Provinces/Territories/Canada (2004 – 2021)

P/T	2004	2006	2007	2008	2010	2012	2014	2016	2019	2021
NL	35	34	61	67	77	104	104	155	119	110
PE	6	131	5	5	4	4	2	1	3	4
NS	34	32	37	37	94	158	224	235	281	168
NB	25	45	47	55	87	120	151	188	177	145
QC	13000	13776	14431	15123	15304	15448	15514	14687	12661	9884
ON	7765	7716	7524	7822	7071	6142	5765	3765	3918	3210
MB	591	588	551	518	468	420	426	425	448	443
SK	291	290	276	275	269	245	243	226	238	242
AB	1741	2694	2694			2781	2042	1999	1892	1801
BC[1]	2525	2067	2097	2125	2254	2213	2071	1700	1700	1755
YT	43	41	39	32	35	30	30	23	23	22
NT	32	44	43	50	49	49	50	40	51	51
NU						1	1	1	2	5
CA	26088	27333	27805	26109	25712	27715	26623	23445	21513	17840

Source: Early Childhood Education and Care in Canada 2021-Beach et al. (2023)

Table 4C: Number and Per cent of Centres and Centre Spaces for 0-12-year-olds that were For-profit. Provinces/Territories, 2021

P/T	Number of centres that were for-profit	Percent of centres that were for-profit (%)	Number of full- and part- day centre spaces that were for-profit	Percent of full- and part- day centre spaces that were for-profit (%)
NL	116	62	5194	70
PE	88	59	3988	63
NS	168	55	8543	55
NB	473	68	20723	66
QC	1979	56	118041	21
ON	1368	25	97929	21
MB	36	5	1810	5
SK	7	2	275	2
AB	1244	59	87204	66
BC[1]	1859	57	61857	54
YT	29	59	1219	73
NT	0	0	0	0
NU	0	0	0	0
CA	7367	43	406783	29

Note: The data includes full-day, part-day nursery school/preschool and school-age centres and centre spaces. No data available for part-day for-profit centres (i.e., jardins d'enfants) and there are no for-profit before-and-after school spaces, as all are operated by school authorities. Therefore, these figures only include full-day spaces. No data available for number of school-age centres in schools, therefore the per cent of centres that were profit only includes full-day centres.
Source: Early Childhood Education and Care in Canada 2021-Beach et al. (2023)

Shine On

CSLS

Centre for the
Study of Living Standards
Centre d'étude des
niveaux de vie