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# SPECIAL REPORT

## TD Economics

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November 27, 2012

## EARLY CHILDHOOD EDUCATION HAS WIDESPREAD AND LONG LASTING BENEFITS

***The following is a literature review of the benefits and costs associated with high-quality early childhood programs. It is not meant to provide explicit policy recommendations, as it is a very complex sector and requires a more in-depth analysis before detailed recommendations can be made.***

### Highlights

- There is a great deal of literature showing compelling evidence of the benefits of early learning. Not only do high-quality early childhood education programs benefit children, they also have positive impacts on parents and the economy as a whole.
- Several studies show that the benefits of early childhood education far outweigh the costs. However, quantifying these benefits is not an exact science and results are likely subject to a large margin of error.
- Given the unquestionable number of benefits that early childhood education can provide, it follows that more focus should be put on investing in, and improving, the system. Indeed, in most parts of Canada, there currently exists a gap between parental leave and the start of formal schooling, and the limited child care spaces that are available are often very costly for parents.
- The federal and provincial/territorial governments provide some funding for early childhood education, and have taken some steps to improve the system. Still, public spending in Canada falls short of that in many advanced economies. While governments at all levels are in no position to boost program spending at this time given budget constraints, this is one area that they should consider making a high priority over the medium term, as their finances move back into balance.
- Ultimately, investment in early education can help to address core economic and social challenges facing Canada. It can help reduce poverty, address skills shortages, improve productivity and innovation, and a host of other national priorities.

Education and skills development unlock the potential of individuals and shapes the quality of their lives. Learning takes place in all stages of life, and the biggest impact happens early in life. While it is well acknowledged that primary, secondary and post-secondary schooling develops and enhances key life skills and abilities, the learning that occurs during the first few years of life can have important, long-lasting effects that are often underestimated. There is a great deal of literature showing overwhelming benefits of high-quality, early childhood education – gains not only for children, but for parents and the economy as a whole. A large number of studies estimate that the benefits of early learning far outweigh the costs. Indeed, the analysis shows that for every dollar invested, the return ranges from roughly 1.5 to almost 3 dollars, with the benefit ratio for disadvantaged children being in the double digits. One needs to acknowledge, however, that quantifying these benefits is not an exact science and a large margin of error

likely exists. So, the benefit/cost ratio must be interpreted with caution. Nevertheless, with an unquestionable number of positive effects, it is evident that more focus should be put on investing in, and improving, the early learning system.

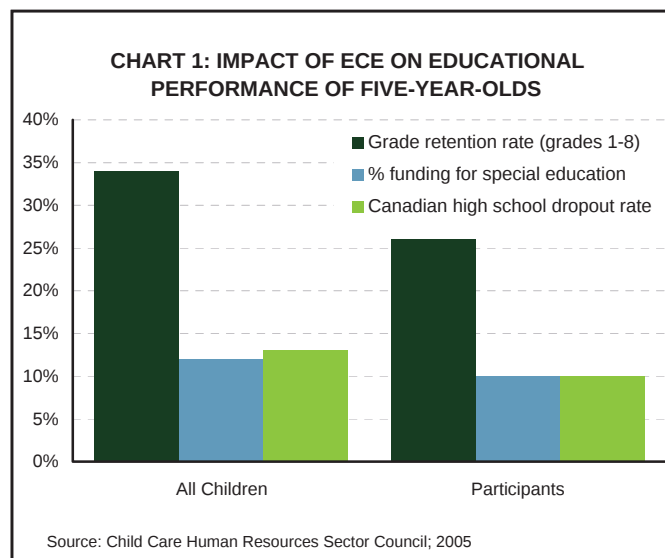
In Canada, early childhood education is provided in a piecemeal fashion. In most parts of the country, there is a gap between the end of parental leave and the start of formal schooling, during which parents are on their own to find care and education for their children. Oftentimes, where it is available, the cost for parents is prohibitively high. The quality of available early child care is also varied across communities.

While the federal and provincial governments do provide over \$11 billion of funding, spending on the early childhood education sector in Canada is lagging behind the majority of other advanced economies. This suggests that more fiscal dollars should be earmarked for early learning. To give a rough estimate, it would take an additional \$3 to \$4 billion of investment to bring Canada up to the average of other industrialized nations. It is also not evident why primary education starts at age 4-5. This seems to be a legacy of a policy that was in place before we understood the degree of learning that takes place early in life. Unfortunately, governments at all levels are in deficit reduction mode, and are therefore unlikely to take on large-scale new policy initiatives in the near term. As fiscal rebalancing occurs, the federal and provincial governments should give additional thought as to how to invest more, and how to invest more effectively, in early childhood education.

Ultimately, investment in early education can help to address core economic and social challenges facing Canada. For parents, it can help to foster greater labour force participation. But more importantly for children, greater essential skills development makes it more likely that children will complete high school, go on to post-secondary education and succeed at that education. It raises employment prospects and reduces duration of unemployment if it occurs. Investment in skills development can help to address future labour shortages and add to productivity and innovation. It can also reduce poverty and help to address income inequality. At the end of the day, investment in education is the great enabler that leads to a stronger economy and society.

#### Early learning has long-lasting impacts on children ...

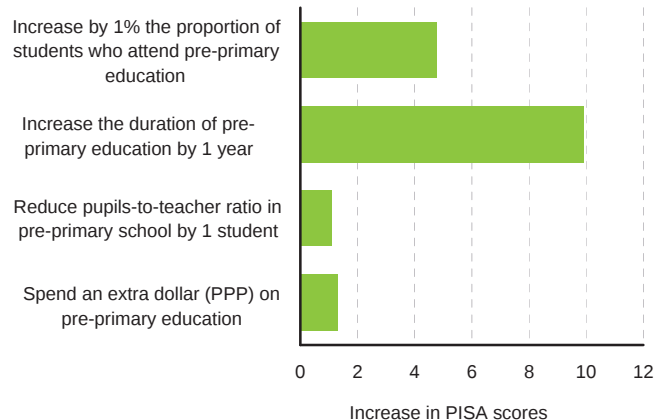
The benefits of early childhood education are widespread, but they start with the children. There is scientific evidence showing that experiences during the first five years



of life have a material impact on economic and social success, including educational and career attainment, health and overall well-being. While it was previously thought that human abilities were driven largely by genetics and less by the environment, many scientists now believe that the opposite is true, with a person's outcome in life driven largely by what happens after birth. Some have argued that a person's abilities are roughly 80% determined by their environment and only 20% by genetics<sup>1</sup>. Indeed, basic abilities can actually be altered early in life, allowing children to reach a higher potential. Babies are born with a set of genes, but experiences early in life can alter gene expression and also shape the quality of the brain architecture. The brain is more receptive to stimuli before the age of six, suggesting that it is more difficult to improve a child's learning abilities later in life.

The literature is overwhelmingly consistent in finding that exposure to high-quality education in the early years generally leads to improved cognitive and language development, as well as better numeracy abilities – all skills that are essential to succeed in today's society. In fact, research indicates that early math, reading and attention skills are the best indicators of educational attainment<sup>2</sup>. Early language exposure impacts the extent of a child's vocabulary, as well as verbal and literacy skills later in life. Indeed, research in the U.S. indicates that weak verbal skills at the age of three tends to result in poor language and literacy skills once the child begins school, and poorer overall academic careers<sup>3</sup>. A Quebec study found that reading activities beginning at 18 months can contribute to a child's reading ability and, in addition to conversation, can help maximize a child's

**CHART 2: SCORE POINT DIFFERENCE ON PISA RESULTS**



Source: OECD

**TABLE 1: ECONOMIC AND SOCIAL OUTCOMES**

|                                       | Participants* (%) | Control Group (%) |
|---------------------------------------|-------------------|-------------------|
| Smoked                                | 41.5              | 50.7              |
| Used hard drugs                       | 22.2              | 29.3              |
| Used soft drugs                       | 45.3              | 54.4              |
| Treated for drug or drinking problems | 22.2              | 33.9              |
| Owned a home                          | 36.7              | 26.6              |
| Owned a car                           | 73.8              | 60.9              |
| Had life insurance                    | 66.5              | 53.8              |

Source: Child Care Human Resources Council

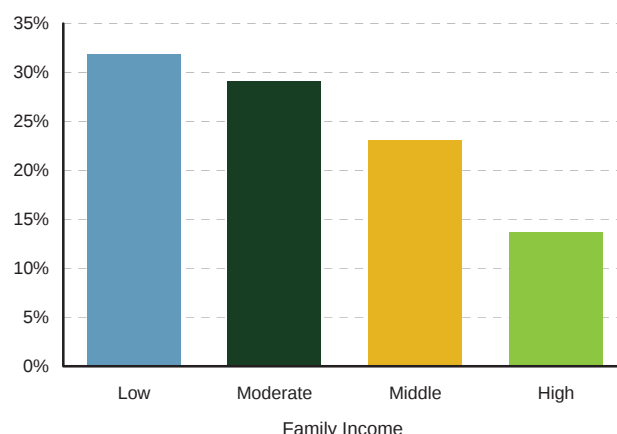
\*Participants of the High/Scope Perry Pre-School Program

vocabulary<sup>4</sup>. Moreover, research in New Zealand found that after age eight, improving performance levels became much more difficult<sup>5</sup>. The benchmark for international comparison of youth skills development is the Programme for International Student Assessment (PISA) survey. The scores clearly indicate that children who participated in an early childhood education system tend to perform better than those that do not (See Chart 2).

In addition to building fundamental skills, early childhood education programs can help to identify learning or developmental delays at an early stage, and provide children and parents with appropriate support. Not only does early detection allow the child to receive specialized help sooner, addressing such issues at the onset can help to prevent an issue from intensifying and having to correct it at a later age, which could prove to be a bigger challenge – and more costly.

There is also compelling evidence that economic, social and health outcomes are better for children who were exposed to early education. The development that takes place

**CHART 3: VULNERABILITY OF CHILDREN BY SOCIO-ECONOMIC STATUS**



Source: Report to the Premier by the Special Advisor on Early Learning

in a high-quality early childhood education program helps children to be better prepared for, and transition more easily into, kindergarten. Studies show that children who enter kindergarten with a higher skill set generally experience fewer grade repetitions, on time graduation, lower dropout rates and higher post-secondary attendance than those that enter with vulnerabilities. The more education and skills that people acquire, the more able they become, leading to higher productivity. In turn, job prospects are brighter and potential earnings are higher, ultimately reducing the likelihood of an individual ending up in poverty and/or on welfare. A U.S. study showed that participants of an early childhood education program were less likely to smoke, drink alcohol, and use drugs, while they were more likely to own a home and a car <sup>6</sup>. (See Table 1)

In addition to fostering cognitive development, early childhood education programs influence the socio-emotional development of children. Here, the literature is somewhat divided. On the positive side, some research shows that children enrolled in early childhood education programs have less behavioral problems, good relationships with their peers and better compliance with adults<sup>7</sup>. Other studies found no positive or negative effects, while few revealed that extended periods of time in child care led to increased aggression and lower quality of mother-child interaction<sup>8</sup>. That said, the studies that found negative implications noted that the quality of child care mattered, and that the findings may have been influenced by external factors, leading to biased results. Thus, of the research that was conducted with more credible methodology, the results were generally positive.

There is widespread agreement that disadvantaged

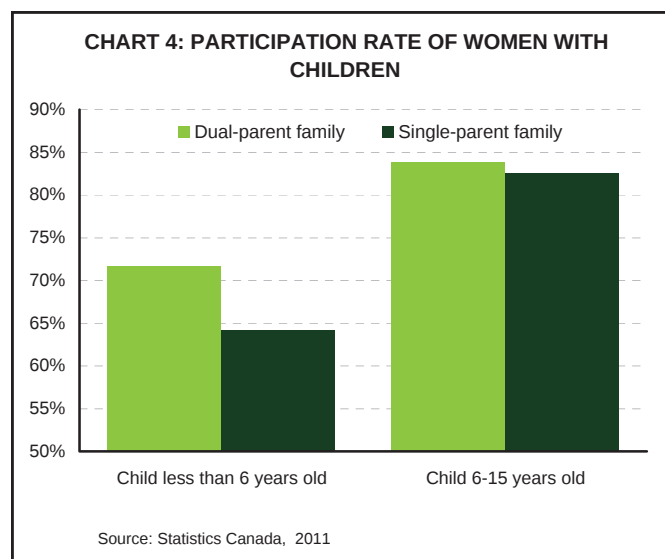
children – typically taken to mean those from low-income families – receive greater benefit from early childhood education, particularly with respect to social outcomes and future economic well-being. Still, early learning has been proven to improve the abilities of all children, even those from more affluent families.

### ...and allow parents to increase family income

Access to high quality, affordable childcare can generate further benefits for families, as it allows mothers (or fathers) to enter or return to the labour force, or to upgrade their skills through schooling or other personal development programs. For low-income families or single parents, the ability to work while children are young can mean the difference between living off of welfare or rising above the poverty line. And, this isn't just an inflow of money in the short-term. The more one works or becomes educated, the higher the potential salary throughout their lifetime. Moreover, it can impact decisions on whether to have children, and if so, how many.

Higher family income is beneficial for children too, as it can give them access to a higher quality of life, both through health and nutrition, as well as through increased opportunities to engage in extra curricular activities that parents may otherwise not be able to afford.

While there are clearly benefits of increased family income, there have been some findings that point to negative effects of parents working rather than staying home with a child. These include more hostile and less consistent parenting, a lower quality child-parent relationship and behavioural issues with the child, such as aggression<sup>9</sup>. However,

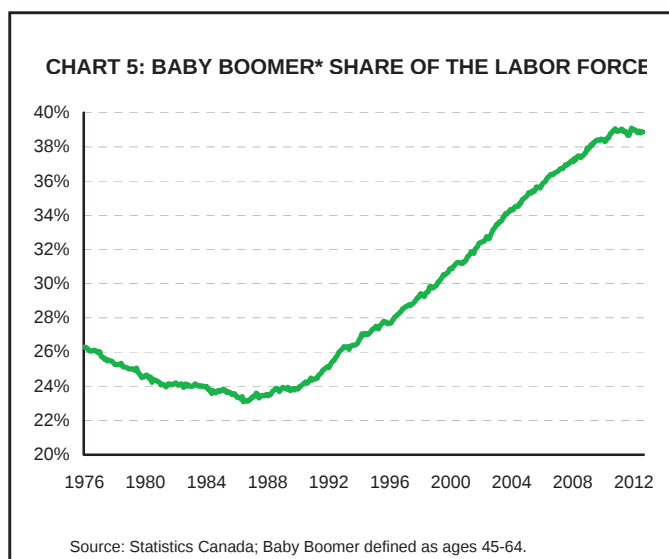


researchers note that benefits from the increase in income may offset this negative parenting outcome. Moreover, the study was based on short-term findings, suggesting that the negative impacts could be transitory and that outcomes could be better in the long run. As well, there was no control group, suggesting that the results could be biased.

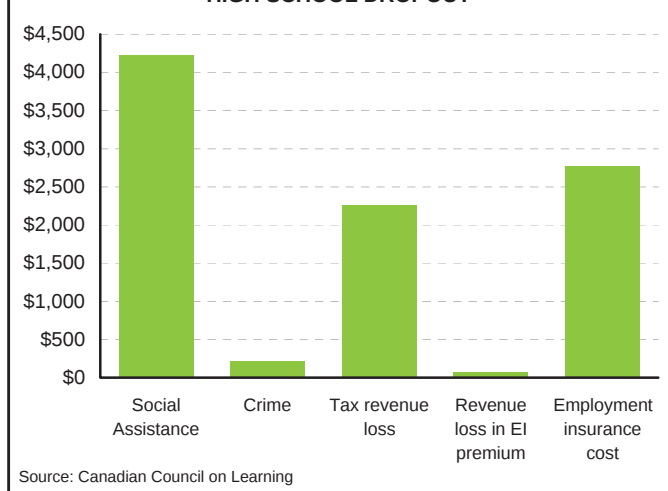
### Better educated children leads to a better educated workforce

Widespread use of high-quality early childhood education programs not only benefit the children and their families, but can have a positive effect on the economy as a whole. While increased participation of mothers in the workforce would have positive near-term effects – such as higher government revenues through higher income taxes, and perhaps fewer families on welfare or in poverty – the literature provides persuasive evidence that shaping the country's future workforce now will prove to be extremely beneficial down the road.

Building human capital through better educated children means that the country's future workforce will be more highly skilled – an important fact considering that changes in demographics are likely to result in a shortage of high-skilled workers around the world. Moreover, workers will be more productive, innovative and earn higher wages, while fewer will be in poverty. Together, these factors can boost the overall standard of living in the country. What's more, demand for social and healthcare costs would decline – due to lower high school drop out rates, fewer instances of drug and alcohol use, smoking, teen pregnancies, and criminal behaviour – allowing governments to allocate funds else-



**CHART 6: ESTIMATED ANNUAL COST OF ONE HIGH SCHOOL DROPOUT**



where. Indeed, the Canadian Council on Learning estimates the annual cost over the lifetime of one child who does not complete high school is \$7515 due to lost income revenues, and higher social and criminal justice costs<sup>10</sup>.

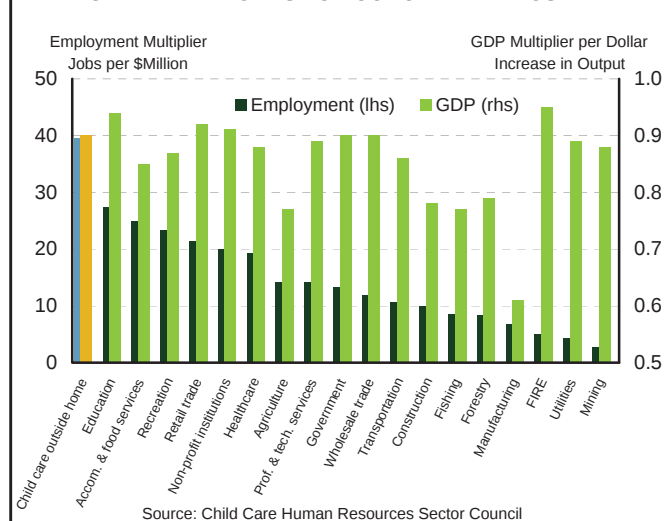
Compared to other industries, investment in early childhood education can provide a large return for the economy. According to Statistics Canada, the GDP multiplier – which measures the change in overall output in Canada from a change in output of a given industry – for child care outside the home is among the highest of all industries at 0.90, behind only financial services, education, retail trade and non-profit institutions industries<sup>11</sup> (See Chart 7). Moreover, the employment multiplier for the sector – which measures the number of jobs created per million dollars of increased output in a given sector – at 36.92<sup>12</sup>, is by far the highest across all industries, suggesting that early childhood education does not only provide significant benefits to children, families and the economy, but it provides a better return on investment than many other sectors. (See Chart 7)

### The benefits outweigh the costs

With all the benefits of early childhood education, it begs the question of why we don't have more programs in place and why it is not a high priority for policymakers. The obvious answer is that high-quality programs are very costly. That said, there are countless studies that suggest that the benefits of early childhood education far outweigh the costs.

Taking into account the increase in government revenues from income taxes of parents who would not otherwise be able to work, plus the reduction in social costs, special education costs and healthcare costs associated with better

**CHART 7: RETURNS TO ECONOMY BY INDUSTRY**



educated children, many analysts have come to the conclusion that the program pays for itself. In fact, Canadian cost-benefit analyses indicate that for every dollar spent on early childhood education, the benefits range from \$1.49 to \$2.78. American studies estimate benefits to be as high as \$17 for every dollar spent, although the programs analyzed were solely for 'disadvantaged' children<sup>13</sup>.

While the cost-benefit analyses provide consistent results, any policy claims that initiatives will pay for themselves will naturally be met with skepticism. The estimates are just that – estimates, and calculating these estimates is not clear cut. Costs can be much higher than anticipated, as projects can easily run over budget (i.e. construction, training, etc.), and operating costs can rise faster than expected.

The benefit side is even more complex. Quantifying benefits is a difficult feat, which requires making many key assumptions. This alone suggests that the margin of error can be quite large. For example, researchers assume

| TABLE 2<br>STUDIES OF COST-BENEFIT ANALYSIS OF ECE PROGRAMS                                          |                     |
|------------------------------------------------------------------------------------------------------|---------------------|
| Study                                                                                                | Benefit / Cost (\$) |
| Economic Consequences of Quebec's Educational Child Care Policy, by Fortin, Godbout & St-Cerny, 2011 | 1.49                |
| Better Beginnings, Better Futures by Peters et al., 2010                                             | 2.00                |
| Workforce Shortages Socio-Economic Effects, by Fairholm, 2009                                        | 2.42                |
| Child Care as Economic and Social Development, by Prentice, 2007                                     | 2.78                |
| The Benefits and Costs of Good Child Care, by Cleveland & Krashinsky, 1998                           | 2.00                |
| Source: Early Years Study 3                                                                          |                     |

that the labour force participation rate will rise, generating increased income from more working mothers. This assumes that mothers do in fact choose to return to the workforce once they enroll their children in a child care program. While some programs, such as the one in Quebec, have been shown to increase the female participation rate, the participation rate in the rest of Canada increased during the same period suggesting that there were external factors that incited women into the workforce as well. Furthermore, the participation rate for women in the 25-54 age group in the country is already quite high, at 82%, so it doesn't have much room to grow (the equivalent rate for males is 90%). This analysis also assumes that these mothers will be able to find a job, and meet the average hours worked. As well, it assumes that workers are paid the median or average salary. There probably isn't a better method to gauge income levels, but the realities of what these women actually earn can have a large impact on the outcome – particularly if the majority of the women returning to work are in low-wage, low skilled jobs (higher income mothers are more likely to return to work in absence of a publicly funded program).

Longer-term benefits are also difficult to quantify, as there are many unknowns about the future. Hence, estimates regarding development, education and social abilities are more suggestive rather than a sure thing.

Another issue is that both the experimental and control groups may be influenced by external factors that can lead to biases, skewing the results. For example, changes in parental involvement can influence outcomes. Research shows that the more a parent is involved, the more the child will benefit.

Of the cost-benefit analyses done, many have focused on specific early childhood education programs in specific locations, suggesting that the results may not be replicated elsewhere. For instance, if the program that Quebec implemented was applied nationally, it would likely have different impacts in different areas of the country. Moreover, the way a program is implemented can influence the final outcome. So to get the results that the analyses indicated, the programs would have to be executed in exactly the same way across the country. Hence program design and the type of families served can have a considerable impact on the overall outcome.

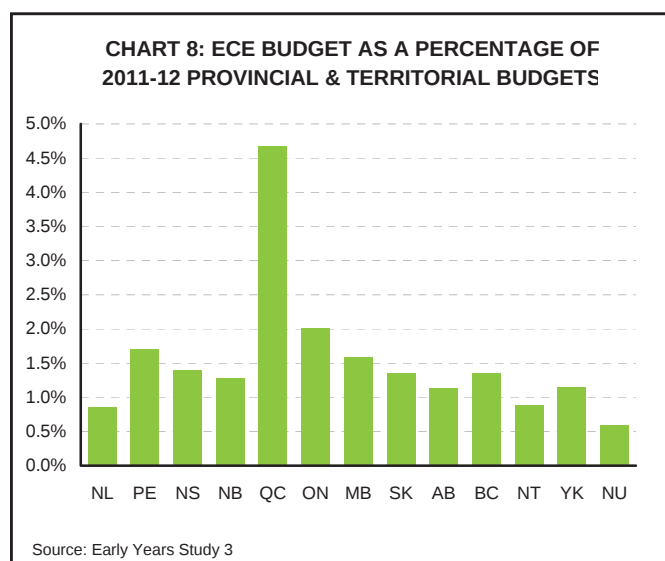
### Some efforts have been made to improve the system

While there is a great deal of subjectivity in the cost-benefit analysis, the fact that they all show benefits exceeding

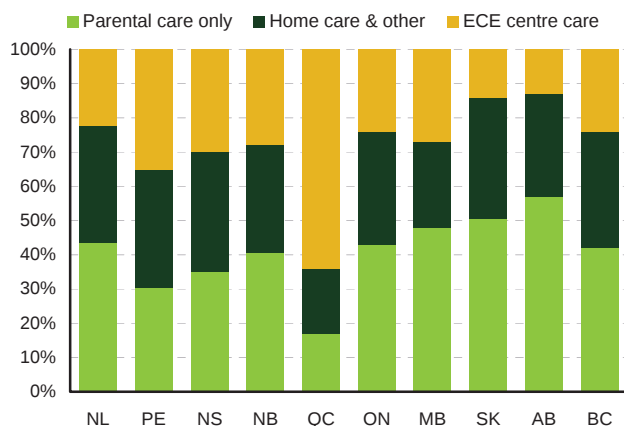
costs suggests that this is a sector that does indeed generate a great deal of benefit and thus more focus should be put on investment in, and improving the outcomes from, the sector.

In most parts of Canada, there currently exists a gap between the end of parental leave and formal schooling, providing a challenge for parents who wish to work, or have to work, to find care for their children. Indeed, in several areas, accessibility is an issue for parents, as wait lists for daycare centers are quite long, while the costs are out of reach for some families. Moreover, the current system is fragmented, as parents have to piece together programs to meet their work and family needs. Given the analysis on cognitive development, it is not evident why schooling starts at ages 4-5.

While education and child care both fall under provincial legislation, the federal government has been providing funding for child care and/or early learning programs for over four decades, through transfers to individuals and provincial/territorial governments. Federal spending on the sector amounted to about \$1.2 billion in the 2011-12 fiscal year<sup>14</sup>, plus about \$2.5 billion through the Universal Child Care Benefit<sup>15</sup>, in which the government transfers \$100 per month per child under the age of six directly to families. Provincial and territorial investment in the sector is much larger, tallying about \$7.5 billion during the same period. Spending is uneven across the country, with an average of 1.53% of total provincial/territorial budgets allocated to early childhood education, ranging from a low of 0.59% in Nunavut to a high of 4.67% in Quebec<sup>16</sup>. It should be stressed, however, that any evaluation of provincial/territorial programs must reflect factors beyond the allocation of



**CHART 9: TYPE OF CARE RECEIVED BY CHILDREN AGED 0-5**



Source: Early Years Study 3

resources, such as: demand for childcare in each region, private investment and services, as well as the effectiveness and efficiency of the current programs. This goes beyond the scope of this paper, but is critical in assessing adequacy of public investment.

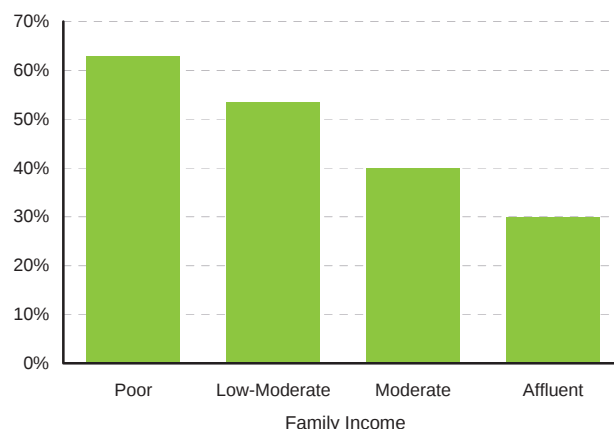
Given the differences in governing bodies and investment levels throughout the nation, it is not surprising that there are differences in the services and care provided in each province and territory. Quebec has the most comprehensive program, as it universally provides \$7 per day child care for children aged 0-12 (including before and after school care). Studies show some positive effects following the implementation of the program, including a rise in the female participation rate from lowest to highest in Canada, moving above the national average on standardized test scores, an increase in fertility rates and a 50% reduction in poverty. Quebec also has the lowest share – by a large margin – of 2-4 year-olds who receive parental care only compared to other provinces. (See Chart 9)

Elsewhere in Canada, some action has been taken to improve early learning. Six provinces, including P.E.I., New Brunswick, Ontario, Saskatchewan, Northwest Territories and Nunavut have taken steps to merge the education and child care programs. Ontario, B.C. and P.E.I. have added full-day kindergarten, while Newfoundland and Labrador, Manitoba and Saskatchewan are considering doing so. Some jurisdictions have expanded access for at-risk 3- and 4-year-olds as well. While federal and provincial governments provide some funding for the industry, it is still largely run

by the private sector, with government involvement limited to health and safety regulations in most regions. Indeed, unlike the formal education system, child care centers in many regions are not required to follow a defined curriculum.

Funding has been on the rise in most provinces and territories with many increasing the number of child care spaces in recent years, while some raised subsidy ceilings (Saskatchewan, Nova Scotia, Yukon, Newfoundland and Labrador, Alberta) and/or revised eligibility requirements in order to increase affordability for parents (Ontario, Quebec, Nova Scotia, Newfoundland and Labrador, Yukon). However, even with these efforts, parents are still finding it challenging to find accessible, affordable child care. The public programs that currently exist are well utilized. Kindergarten for 5-year-olds is available in all jurisdictions and even in areas where it is not mandatory, over 99% of children attend. Similarly, Ontario offers kindergarten for 4-year-olds, with a participation rate of over 80%. In fact, demand exceeds supply in several areas. In Quebec, there are not enough \$7 per day spaces to meet demand, forcing some parents to pay a larger amount for child care. Even where fees are high, demand also appears to outstrip supply in many regions – the Prairie Provinces in particular. Meanwhile, there is still a gap between the amount of the subsidies and the cost of child care for parents, forcing some low-income families to use less regulated care centers. This is evidenced by the fact that over 60% of children under 6 years of age from poor families do not participate in out-of-home daycare compared to only 30% of children from affluent families. (See Chart 10)

**CHART 10: CHILDREN AGED 0-5 WITH NO OUT-OF-HOME CARE BY INCOME**



Source: Early Years Study 3

## Public spending in Canada lagging behind

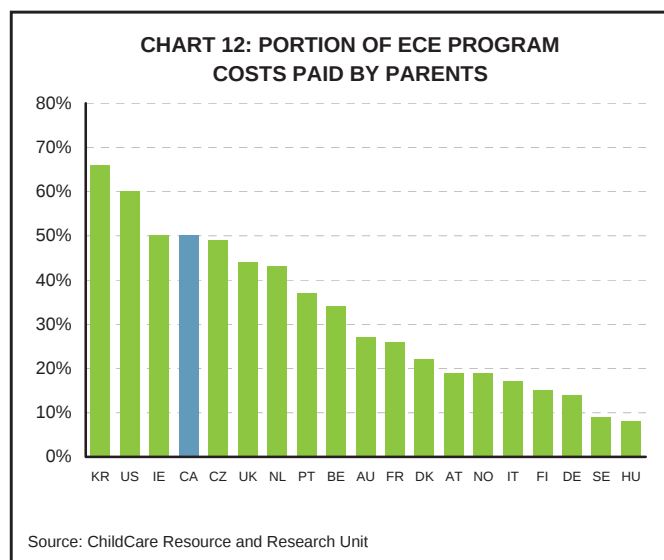
While steps have been taken to improve the early childhood education system across the country, it is clear that there is demand for much more. And further government investment would go a long way helping achieve a better system. In truth, total public spending in the sector in Canada has fallen short of many of its peers. At 0.25% of GDP, Canada ranks last among comparable European and Anglo-speaking countries. (See Chart 11) Even looking at family support, including child payments, parental leave benefits and child care support, public spending in Canada is 17% below the OECD average<sup>17</sup>. Meanwhile, parents, on average (except in Quebec), cover 50% of program costs – the fourth highest rate among select OECD countries. (See Chart 12) Hence, one could argue that Canada has been under-investing in early childhood education.

In order for public spending on early learning programs in Canada to be more in line with the average seen in OECD countries, public investment would have to rise by roughly \$3-4 billion. Unfortunately, with governments at all levels currently in deficit fighting mode, increasing spending on large-scale new programs is not in the cards.

Still, given such persuasive evidence of the widespread benefits that early learning promotes, there is scope for further investment and reform in the industry. Hence, once government balance sheets are back in order, they should consider placing investment in early learning as a high priority.

## Conclusion

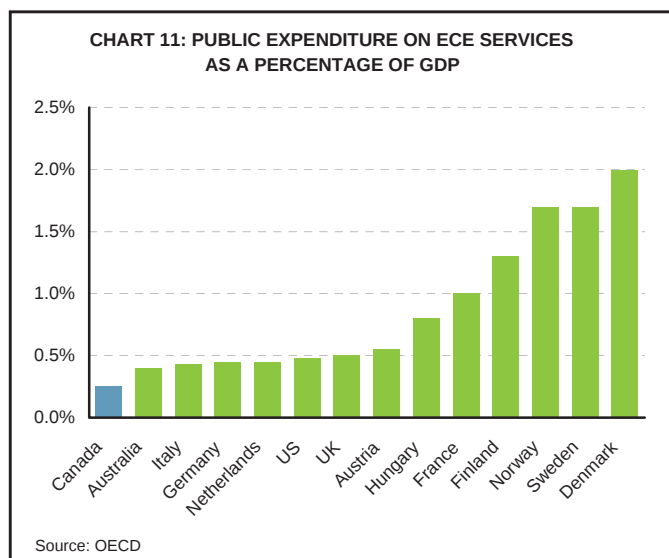
Few would argue the benefits of early childhood educa-



tion. In Canada, however, many parents are having trouble finding a spot in daycare for their children, and the cost is extremely high (with the exception of Quebec). While public investment in the early childhood education sector in Canada is lagging behind that of its peers, the current period of fiscal restraint makes it difficult for governments to boost program spending. Overall, having an efficient, high-quality early childhood program in place, which is accessible for all children and affordable for parents, would be beneficial for children, parents as well as the broader economy. Education is the ultimate tool to address many economic and social challenges. Increased education leads to improved skills development, which is the great enabler that allows individuals to unlock their potential. It creates a wider option for careers, raises employment, lowers unemployment and reduces the duration of unemployment. This leads to a higher standard of living for individuals. A more skilled workforce creates a more innovative and productive economy. It can address future pressing issues, like skills shortages. Stronger skills development can also reduce social ills, like poverty. While governments are in no position to take on new spending programs at the moment, over the medium term, they might consider focusing more attention on improving the early childhood education system.

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