Health Economics and Human Services: Family Resource Centers in Alberta, Canada by

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ABSTRACT

Government and non-profit programs are under increasing pressure to demonstrate the value of their work. However, there are few structures in place to evaluate spending and outcomes in a way that is comparable between agencies and programs serving the same population. Using Parent Link Centres in Alberta as a case study, we demonstrate the use of economic analysis in a complex system integrating health and human services. The first paper establishes a baseline of costs and resources in the Parent Link Centres and examines the economic contribution of volunteers. The second section is a cost function analysis of the centres, and the third paper compares the economic behaviour of non-profit versus government operated centres. Finally, we perform a social return on investment for the parenting program in the centres. Economic analysis, more often used to assess health interventions, can place seemingly different and difficult policy questions within the same framework.

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INTRODUCTION

In health and human services, funding agencies have increasingly required providers to account for their activities and associated spending (Alberta Human Services, 2011). Frequently, there is direct or indirect competition between organizations for resources. Within a single organization, decisions must be made between different programs. Though this increased accountability adds to the administrative burden, there are few structures in place to evaluate spending and outcomes in a way that is comparable between agencies and programs. Health economic analysis, more often used to assess health interventions, can answer these questions by placing seemingly different and difficult policy questions within the same framework.

While often associated with cost accounting, economics is simply the study of scarce resources and how to distribute them (Knapp, 1984). The analysis in this thesis includes both economic evaluation and economic prediction. Economic evaluation weighs different choices, whether policies, programs, or interventions (Drummond, 2008). It goes beyond describing what a program does and asks whether it is worth investing in the program to begin with (Knapp, 1984). Economic analysis has become so integrated into policy analysis that the World Health Organization established guidelines for the economic analysis of disease and injury in 2009 (World Health Organization, 2009). Economic prediction extends this analysis, using modeling to project the costs and benefits of an intervention into the future

In interventions such as mental health promotion, there is a great deal of overlap between health and human services. For example, an individual may first encounter public services in healthcare, human services, or social services, after experiencing mental health problems as a

child. In later childhood and adolescence, they may use more health care services because of injuries or substance abuse. Their family may experience job insecurity because of excess caregiving. The same individuals may grow up to eventually be heavy users of social services such as unemployment benefits or even the criminal legal system.

Interventions intended to prevent problems that are difficult to define such as mental health promotion in families are *complex interventions.* The term *complex intervention* originated in the UK to describe costly health interventions which are difficult to evaluate. Complex interventions share the following characteristics:

- variability in outcomes
- interactions between the intervention and control
- inconsistent delivery of the intervention
- the number of different target groups, and
- the difficulty of behaviours within the intervention (Craig, 2008).

In mental health promotion, to use an example, there is variability in outcomes in several areas, social services, healthcare, the justice system, etc. There are a variety of interventions, community groups to inpatient mental health, and many target groups, from families to older individuals. The "difficulty of behaviours" ranges from self-harm, difficulty in a working environment, to aggression to the point of involvement with the criminal system. By analyzing factors affecting resource use, economic analysis an ideal tool for complex interventions involving the interplay between health and human services, such as mental health promotion in children and families (Shiell, Hawe, and Gold, 2008). Using family

resource centres in Alberta as a case study, I illustrate how economic analysis can be used to evaluate a complex intervention in mental health promotion.

BACKGROUND

Parenting support

Everyday interactions parents have with their children define the practice of parenting (Sanders, 2003). In our case, we will be using the term "parent" to refer to the child's primary caregivers early in life, whether a foster parent or guardian or other caregivers, such as grandparents.

We define parenting as the collection of interactions parents have with their children, with the goal of emotional and social development. Parent education seeks to optimize these interactions. We make a distinction between parent education and parental substitutions such as children's education in preschools and early childhood centres or childcare (California Family Resource Center Learning Circle, 2000). Parental substitutions replace parenting interactions as opposed to parent education, which seeks to directly affect parenting behaviour and family interactions. Interventions directed at parents, including Parent Link Centres in Alberta, offer programs aimed at enhancing the parent-child relationship through activities such as workshops.

Parent education as we know it was pioneered for the most part in the last century, its proponents popularizing the idea that parenting is a skill which could be learned. Spock's Baby and Child Care, Baumrind's oft-quoted parenting styles, and Bowlby's attachment theory played a significant role (Spock, 1946; Baumrind, 1967; Bowlby, 2004). Parenting substitutions such as children's education in preschools and early childhood centres or

childcare can be considered a replacement for the parent-child interaction as opposed to parent education, which seeks to affect parenting behaviour and the direct interactions within the family.

Parenting has become an increasingly commercialized activity, with products including designer strollers, advice books from celebrity parents, and parenting classes costing close to private school tuition (Paul, 2008). In 1957, after Bowlby had introduced Attachment Parenting theory, his wife declared that "it seems a tradition nowadays that every educated mother should read at least one baby-book" (Bowlby, 2004). Nearly 60 years later, a recent search on Amazon yielded about 139,000 parenting guides such as *Simply Parenting, Conscious Parenting,* and *Screamfree Parenting*. In Alberta, most parents use books and other written information as their primary source on child rearing, followed by their child's health care providers (Rikhy, 2010).

Why has a market emerged for parenting supports? While primarily a result of intense marketing, there are developmental reasons for the burgeoning of the parenting market. Not surprisingly, more affluent parents have advantages over lower income families, not only in material goods but also regarding their child's actual development. There is evidence that achievement gaps and disadvantages between children are well established before age five (Reeves, 2013). Differences in language development between children of higher income parents compared to children of lower socioeconomic status can appear as early as eighteen months of age (Fernald, 2013). These differences appear early and can persist through generations (Reynolds, 2010).

Making parenting support freely available to every family regardless of income is considered fundamental to achieving equity when it comes to early childhood development (Reeves, 2013). Long before the educational system becomes involved in the child's life in programs such as Head Start, babies and toddlers spend most of their time with their primary caregivers (Early Child Development Mapping Program in Alberta, 2015). As such, optimizing parenting skills and providing parenting supports have become local and national priorities.

Parent support and education can have positive benefits to the entire population over time and negative consequences in the case of its absence. In this case, parent supports may be considered a public good, along the same lines as education or healthcare. As in the case of healthcare or education, the inclusion of parent supports as a public good is philosophically debatable, but regardless, it has been provided publicly. This is discussed more in Chapter 3, but parenting support and education are provided through the government and non-profits in differing degrees of perceived quality, while a more marketable form is available to purchase through the regular market.

Family Resource Centres in North America

Parent education can be viewed as a continuation of programs that have roots in home economics, which saw parenting programs become provided publicly under the land grant institutions in the United States, founded in 1862 under President Lincoln.

The Cooperative Extension Service in 1914 brought Home Economics Demonstration Agents brought teachers into people's homes, essentially the first government-sponsored home visits for young mothers. There was an attempt in the 1930s to increase the

involvement of fathers, which is still emphasized today. A new program within Cooperative Extension that was considerably more successful in the 1930s was "child-study clubs," groups of mostly mothers that discussed parenting issues and child development. The combination of home visits and group discussions is a format that is still being used today in family resource centers.

The following framework of child development under home economics has persisted to the present day and forms the ideological basis for Family Resource Centers in North America:

1. Families are responsible for the development of children.
2. Healthy children contribute to a healthy society,
3. Educating parents, including fathers, is key to raising healthy children,
4. Educating parents is a public responsibility.

The narrow definition of home economics as food preparation and budgeting has essentially died. However, the idea that families are responsible for the development of a healthy society has persisted and is the root of modern family resource centers today (Smith, 2002).

Parent Link Centres: Family Resource Centres in Alberta

Family resource centres are the core of a structure of services to support the emotional and social well-being of the family. The centres offer services or refer families to other resources, serving more than 400,000 families in Canada each. Programs are flexible and overlap, but all activities of family resource centres have the purpose of enhancing the relationship between parents and their children and reducing harmful interactions (California

Family Resource Centre Learning Circle, 2000). These centres seek to provide families support before problems arise.

The Canadian Association of Family Resource Programs model places parent education and support at the very centre of all early childhood services, such as literacy, nutrition, health care, and education (Canadian Association of Family Resource Programs, 2000). In Canada, family resource centres have various names such as Parent Link Centres in Alberta, Ontario Early Years Centres, national Community Action Programs for Children, and Organisme Communautaire à la Famille in Quebec (Canadian Association of Family Resource Programs, 2000).

Parent Link Centres are provincially operated family resource centres in Alberta. Established by the provincial government in 2003-2004, the Alberta government provided enough funding at the time to develop one centre in each of the ten regions in the Alberta Child and Family Services Authority (CFSA). The Child and Family Service Authority is responsible for direct early childhood services, including early intervention and child care (Alberta Human Services: CFSA, 2015). The goal was to support parents in developing parenting skills, a provincial priority for early childhood development (Government of Alberta, 2013).

While services are universally available to every parent, one of the primary goals was to serve families at risk, defined as those at risk for intervention from child protection agencies, with special needs, and children of Aboriginal background (Alberta Human Services, 2018). Services that Parent Link Centres offer to families include playgroups,

workshops for parents, programs for young children, developmental assessment, and referrals to other agencies (Alberta Children's Services, 2004).

Early childhood and parenting have been identified as an *economic* benefit for a population. The Alberta Premier's Council on Economic Strategy recognized early childhood programs as "an important investment in the future prosperity and quality of life for all in the province." (Premier's Council on Economic Strategy, 2011). In 2013, the Alberta government spent $13 million on Parent Link Centres, and early in 2014, the province invested $3.2 million in creating six new Parent Link Centres in 2015 (Ibrahim, 2014). In spring 2015, three new centres were established, with $1.05 million in funding from the provincial government (Alberta Human Services, 2018).

The Triple P Parenting program

When parents know more about the physical, mental, and social development of their children, it leads to better outcomes. With greater awareness about child development stages and the associated expectations for behaviour, parents not only feel more effective but are more competent (Hess, Teti, Hussey-Gardner, 2004). Parents with adequate knowledge of child development and realistic expectations of their children's behaviour result in better outcomes, even becoming less likely to physically abuse their children (Sanders, 2007; Azar & Rohrbeck, 1986).

A specialized program within the Parent Link Centres is the Triple P parenting program. This behavioural intervention offers interventions to positively affect the interactions between parents or primary caregivers and young children (O'Reilly, 2005). Triple P offers group sessions or seminars designed to reduce problematic child behaviour

through improving interactions between parents and children (Alberta Human Services, 2018). Provided at every Parent Link Centre, Triple P originated at the University of Queensland in Australia. The five principles of Triple P parent education are:

- ensuring a safe and engaging environment,
- creating a positive learning environment,
- using positive rather than punitive discipline techniques,
- having realistic expectations of child behaviour, and
- self-care for the parents themselves (Sanders, Markie-Dadds, & Turner, 2003).

There are several levels of intervention, ranging from Level 2 seminars to Level 4 one-on-one sessions with a facilitator. Stepping Stones Triple P is also available for children with developmental disabilities (Sanders, Markie-Dadds, & Turner, 2003). There is some evidence that Triple P enhances interactions between parents and their children, as well as reduces behavioural problems in children, both individually and within a population (Dean, Myors, & Evans, 2003; Prinz, Sanders, Shapiro, et al., 2009).

In Alberta's early intervention framework, Triple P was identified as one of the programs to "promote strong and vibrant communities" within Alberta and is available in every Parent Link Centre as of 2011 (Government of Alberta, 2012). A skills-training program for parents, it has been shown to have a positive effect on children's behaviour (Nowak, 2008) and has been implemented throughout Parent Link Centres for its relatively strong evidence base. There is specific usage information for the Triple P program for each of the centres (Ministry of Human Services, 2013). There are several levels depending on

the severity of the child's behaviour, as reported by caregivers or teachers. Level 2 are seminars held for parenting information for general, manageable problems. Level 3 primary care is for either group or individual sessions with more extensive behavioural problems. Level 4 Triple P for children 0-12 is individual family counseling for more complex problems.

OBJECTIVES

Parent Link Centres may be considered a public health intervention, with a goal of elevating child and family mental health throughout the province. Both are a collection of services designed to have an impact on the health of the entire population (Sanders, 2008). Unlike public health centres, however, funding at each centre occurs as a lump sum rather than a reimbursement per visit. As a result, there are wide variations in the costs and activities between Parent Link Centres. In answering the following questions, our goal is to analyze complex interventions in health and human services using economic tools:

Chapter 1. How do we define the economic makeup of an organization, and how does it affect productivity in the provision of family services?

In our first paper, we establish the background analysis of family resource centres in Alberta as providers of parenting education. We argue both that there is a market for parenting education and that it is a public good that is provided by the province. Given this, we examine the economic aspects of family resource centres, the outputs as providers of parenting education, as well as the resources going into the operation of the centres.

In healthcare settings, maintaining ideal staffing ratios is considered essential as it affects service provision. We examine the productivity of family resource centres, making the

connection between resource inputs (staffing) and outputs (number of families attending the centre).

Chapter 2. What affects the cost to operate the centre?

To evaluate program services and plan for possible expansion, it is essential to find what drives cost. There is a wide range of variability in service and resource use in family resource centres. We use a cost function analysis to determine the relationship between average cost and the factors involved.

Chapter 3. What is the role of government and non-profit partnerships in Parent Link Centres?

Health and human services often occur in a partnership, the most common being between government and non-profits. The first two papers address the operation and economic behaviour of family resource centres. The wide variation between centres raises the question of whether these differences stem from the nature of the Parent Link Centre itself as either a not-for-profit or government entity. We examine this economic behaviour in family resource centres and how it affects the delivery of services.

Chapter 4. What is the long-term rate of return on parenting education in the province?

In a complex intervention such as parenting education, long term modelling in health economics can be used to assess the value of implementing the program. In this paper, we examine the relationship between the costs and consequences of providing parent training, as well as the economic consequences (or savings) of not providing the service at all.

CHAPTER 1. THE ROLE OF FAMILY RESOURCE CENTRES-ECONOMIC BEHAVIOUR AND PRODUCTIVITY

Introduction

Parenting has become an increasingly commercialized activity, with products including designer strollers, advice books from celebrity parents, and parenting classes costing close to private school tuition (Paul, 2008). Not surprisingly, more affluent parents have advantages over lower income families, and these differences appear early and can persist through generations (Reynolds, 2010). Making parenting support freely available to every family, regardless of income, is key to leveling the playing field when it comes to early childhood development (Reeves, 2013). Family resource centres publicly support young children and families through parenting education and other activities, serving more than 400,000 families in Canada each year (Canadian Association of Family Resource Programs, 2000).

Despite a growing interest in early childhood services and the role of parent education, there has been no information on the *economic* aspects of Parent Link Centres. A review of family resource centres in 2004 revealed considerable shortcomings in preventive family service centres (Alberta Children's Services, 2004). At the time, parenting resources were provided by a fragmented group of family resource centres. There were few comprehensive services, a shortage of convenient opening hours, and a lack of standardization of the quality of services offered. One of our objectives is to evaluate how well individual centres adhere to this mission, having been previously independent but now under the umbrella of Parent Link Centres.

The mission of the Parent Link Centres, upon their establishment in 2004, was to serve families "at risk." This was defined at the time by families with children with developmental delays, or at risk for apprehension by Child and Family Services, or First Nations families (Alberta Children's Services, 2004). Although having First Nations status does not constitute a "risk," they were chosen as a population for which supports were to be targeted. For each Parent Link Centre, data is gathered about the number of First Nations families and children attending the centre, and screenings are performed to identify children with possible developmental delays for follow-up. The risk for apprehension by Child and Family Services is more ill-defined and consequently, more difficult to evaluate. For this paper, we are interpreting it as whether a centre offers the Triple P parent education program, which has been shown to reduce harm from physical punishment and increasing positive interactions between parents and young children.

Health economics techniques need not be confined to health services but can be used for human services such as parenting programs. Better planning can be achieved by examining use and efficiency, and how service outputs vary with resource inputs within the organization. To date, there has not been a cost analysis of the Parent Link Centres or other family resource centres which would facilitate further economic analysis and evaluation. What are the inputs, or resources going into the centre, in funding, staff, and volunteer time? What are the outputs of the centre, or what does it produce, in terms of services, programs? How is productivity affected by an increase in volunteer time?

To establish a baseline for an economic analysis we identify:

1. *Characteristics of the centre*: factors which may affect the output, such as location and demographic information about the clients.
2. *Financing:* funding which the organization uses to obtain resources.
3. *Outputs:* the services and products the organization provides, measured by the number of families using the services and programs
4. *Inputs*: The resources used to produce the output, which includes productivity of employees and volunteers.

Understanding an organization's role requires defining what it produces and the resources used for this production (Munthali, 2014). Using an Alberta Human Services survey of Parent Link Centre directors, we establish a baseline cost analysis by examining the economic characteristics of the centres in terms of client use, resources, funding, and measured resource efficiency using productivity ratios.

METHODS

Data

The provincial government of Alberta established Parent Link Centres in 2004 by partnering with existing non-profit family resource centres and creating entirely government-operated facilities (Alberta Children's Services, 2004). At the time of the analysis, there were 50 Parent Link Centres throughout Alberta that provided family support ranging from community-building playgroups to one on one counselling for behavioural problems. We obtained the year end report from each center, which was a report written by each director of the centre. While it was not designed to collect economic data, the year end reports included basic demographic information for the parents and children (but not income or postal code) and program information. We obtained permission from Alberta Human Services to obtain

this usage data from the centre directors for the Parent Link Centres for the year 2012-2013. Using these reports, we obtained descriptive information on characteristics of the centres; anonymized, aggregate data on client use; the types of programs offered in the centre, community involvement, and facility finance. We used the computer software SPSS 22 and Excel 2013 to analyze the data.

Organization type

We determined whether a Parent Link Centre is a charity registered with Canada Revenue Agency (Canada Revenue Agency, 2016) or an entity that is entirely subsidized and operated by the provincial Child Family and Services Authority (CFSA), in other words a registered charity or a government centre. If the centre is a registered charity, they are eligible for more sources of funding through larger charities such as the United Way and private donations (Canada Revenue Agency, 2016). We performed a keyword search for the organization on the Charities website for Canada Revenue Agency. We started by searching for the Parent Link Centre name. If this had no results, we tried searching for the larger umbrella organization, and finally searched by address on the Canada Revenue list.

Centre characteristics

As many Parent Link Centres have satellite locations, we determined the density of the population for the main location of each centre according to census information for 2011, based on the postal code of the main centre (Statistics Canada, 2014). We used the most specific information available on the region offered by the census to accurately reflect the size of the population in which the Parent Link Centre resides. "Population centre" was used instead of "metropolitan area," for example. We used Statistics Canada's population centre

groups, rural (population less than 1,000), small (pop. 1,000-30,000), medium (pop. 30,000-99,999), and large (pop. over 100,000).

Information from the centre directors did not include average income level of clients in each centre, so we use Statistics Canada data based on the Parent Link Centre postal code. Using the code, we find the prevalence of low income in each of the areas based on the National Household Survey of 2011 (Statistics Canada, 2015c). Statistics Canada defines low income as 50% of the median income after tax, based on the size of the household. For the 2011 National Household Survey, for example, a family of four earning less than $37,562 after taxes would be considered low income. The percentage of low-income families were calculated for each postal code region.

One of the goals of Parent Link Centres is to serve families from disadvantaged groups. Traditionally at-risk groups as defined in the centre reports were either the total number of clients who were immigrants to Canada or those with self-reported First Nations status (Ministry of Human Services, 2013). Aggregate data on client use for each centre included the number of parents and caregivers, children from birth to age five, and school-aged children to teenagers. Each parent, child or youth is only counted once in the report per year.

Resources

We determined indirect resource use including time, measured by full-time equivalencies (FTE's), volunteer time, and hours of operation. Reports separated volunteers by parent volunteers and those from the community and counted the hours both groups contributed to the Parent Link Centre.

We report the number of satellite locations, defined as locations away from the main Parent Link Centre site in which programs were conducted. Total hours of operation each year were measured, including weekends and weekday evenings, as reported by the centre directors.

Programs

The main Parent Link Centre "product" is family programs. The programs centre around five core services- early childhood development, family support, information and referral, developmental screening, and parent education, including Triple P parenting group sessions to address problem behaviour (Ministry of Human Services, 2013). Early childhood development programs include play groups and learning activities for babies to preschool-aged children. Family support includes kitchens, toy lending libraries, and parent groups. Development screening uses the Ages and Stages Questionnaire and other screening tools; children who are flagged for delays are referred to more interventions (Alberta Children's Services, 2004). Everyone is counted every time they participate in the program, so it is possible that a single participant may be counted several times as "visit", though only counted once as a client in centre characteristics as "individual." Program offerings may differ by the specific Parent Link Centre and the perceived needs of their client base (Alberta Human Services, personal communication, 2014).

As a subset of programs, we will measure community involvement by the number of materials produced by each centre, assuming that these materials are distributed throughout the community. The distribution of print materials is another way of connecting with other agencies. The definition of print materials were e-mails, brochures, flyers, etc. distributed for the purpose of promoting Parent Link Centres and their activities.

Finances

Most of the funding still comes directly from the province, with an average of approximately $350,000 for each location (Alberta Human Services, personal communication, 2014). Any extra funding comes from additional sources such as municipal or city funds, national funds, other charities such as the United Way, and personal donations.

Different factors are involved in Parent Link Centre funding from the province. From 2004-2006, fifteen percent of the budget was focused on rural or remote regions, and the rest of the allocation was based on a region's population of children under 6 years of age in each Child and Family Services Authority region. Each region has decision-making power on how provincial funds are disbursed to separate Parent Link Centres. In cities, for example, a Parent Link Centre grant may be focused on one central centre while in rural areas, the money may be spread out over many locations in communities. In the years since then, the allocation has been based on various factors such as new initiatives based on community issues or increasing salaries.

Two centres did not have any financial information, having submitted a year-end-report with no financial data. Four other centres did not have reliable information on their centre finances, reporting totals that were less than provincial funding, so were omitted from the financial analysis.

Financial information is available through the reports on each Parent Link Centre. Revenues and the funding sources were reported, but not how the money was spent within the centre. Parent Link Centres which are registered charities are required by law to report cost allocation. However, these centres were mostly tied to larger organizations, making it

impossible to piece out the costs solely associated with parenting supports. As we do not have direct data on operating costs, we are using the centre reports on revenue as a proxy for costs, assuming that the entirety of this revenue will be spent on programs and operating the centres.

Productivity

We define productivity simply as the ratio of inputs to outputs, measured in physical terms. Outputs are measured as the number of visits. This measure can be further broken down into the number of families served and the number of visits per family. The latter is a measure of service intensity.

Inputs are measured as labor time; other inputs such as capital and supplies are not included in the equation. There are two components to labor time- paid employees and volunteers. Both non-profit and government organizations make use of volunteer workers, who may enhance the productivity of paid employees. Thus, we can use four productivity measures: Visits per paid-worker hour, visits per volunteer hour, families served per paid–worker hour, and families served per volunteer hour. To test whether volunteer workers enhance the productivity of paid workers, we ran a regression of the relationship between output and inputs, which are both paid and volunteer workers.

The relationship is expressed by the following equation:

$$Q = a + bPW + cVW + u,$$

Where Q is output,

PW is the number of paid FTE workers,

VW is the number of volunteer workers, and

a, b, and c are constants to be estimated, while u is an error term. This equation tests whether added worker hours contribute to additional output.

The dependent variables, volunteer workers and paid workers, were not correlated, and the two measures of output, visits per family and number of families, exhibited a normal distribution (K-S test for normality $p>0.05$).

RESULTS

Organization type

We obtained data on 50 Parent Link Centres. There were 19 registered charities that were found on the Canada Revenue Agency website, and a total of 31 which were not listed as registered charities on the website.

Centre characteristics

As shown in Table 1, of the 50 centres in Alberta, 48% (24) of the Parent Link Centres were in small population areas between 1 and 30,000 people. Fourteen were in large urban centres with a population centre of over 100,000, with eleven of these either in Calgary or Edmonton. Six were in medium sized population centres between 30,000 and 100,000 people, and six were in rural areas of less than 1,000 people. Three of the centres were on Metis settlements, out of eight total Metis settlements in Alberta, though all the centres in our analysis were off-reserve and not operated by First Nations and Inuit Health (Alberta Municipal Affairs, 2014).

The 50 Parent Link Centres served a total 46,517 families per year, but there was wide variation in the number of families served by each centre. The average centre served 949.3 families per year, but individual centres ranged from 39 families in a single year to 9,498. As expected, most children using the centre were less than preschool age, with a ratio of 4.4 to 1 school-aged child or youth (Table 1).

Of all families, 9.5% identified as First Nations and 7.7% were immigrants to Canada (Table 1). Distribution of immigrant or First Nations families was uneven among the Parent Link Centres, as some centres had no families with either status, and seven centres had a client population of entirely First Nations families.

Programs

Activities of Parent Link Centres can be placed into five groups: information provision, developmental screening, family support, parent education, and early childhood development (Alberta Human Services, 2018). Early childhood development programs were the most popular, with 62,762 individual families participating, or 1,281 per centre. This represented 50.6% of the total families using the centres. Development screening was used an average of 123.5 times per centre, and 11.4% of children were flagged for further support because of possible delays (Table 2).

Within parent education, The Triple P parent training program is one that is offered in nearly every Parent Link Centre in Alberta. Out of 50 Parent Link Centres, 48 provided Triple P parenting education. Sessions were offered an average of 4.8 times by each Parent Link Centre each year. An average of 11.8 families per centre participated in each centre,

with a completion rate of 63.2%. Nearly half a million print material items (496,449) were distributed in 2012-2013, with 10,132 items coming from a single urban Parent Link Centre.

Resources

There is a total of 266.1 full-time equivalent workers in the Parent Link Centres, with an average of 5.32 per centre. Of these full-time equivalents, 49.6% are trained Triple P level 4 counsellors. The Parent Link Centres rely heavily on volunteers, with an average of 180.5 volunteers per centre. The average hours worked per Parent Link Centre for employed persons was 921 per year or 17.7 hours per week. The average Parent Link Centre has 713.6 hours of volunteer time per year or 3.9 hours annually (Table 3). We did not have information for individual volunteers or paid workers.

Nine Parent Link Centres operated from a single site. There was an average of 6 locations per centre with the largest having 25 satellites (Table 1). Each centre was open an average of 2,837 weekday hours annually, 54 hours per week, or 10.8 hours per week-day. However, as many Parent Link Centres have multiple sites, the hours open per site would be fewer per site. We did not have separate information for individual sites. Weekend hours averaged 102.5 hours per year or .98 hour per day on the weekend. Evening hours had slightly more, with an average of 190.8 hours per year, or 0.73 evening hour per day on a weekday (Table 3).

Finances

Out of the 44 centres included, the total funding for Alberta Parent Link Centres was $19,875,126 with an average of $451,707 per centre (Table 6). The total funding between individual centres varies widely, with a range from $24,897 to $1,783,117. Based on these

factors determined by each region, the province had a smaller average contribution of $24,897 to $522,744 per centre. There was a wide range in the cost per family. Taking all funding sources into account, the cost of serving each family was $772 (Table 6). Most funding for Parent Link Centres comes from provincial sources (85%), specifically Alberta Human Services under the Child and Family Services Authority (CFSA). In fact, 26 out of 43 Parent Link Centres with financial data are solely reliant on provincial funding.

Productivity

The average Parent Link Centre had a productivity ratio of 0.24 visits per paid – worker hour. That is, every four hours worked was associated with one visit (Table 4). There was a wide range in worker hours, however. The least productive centre had a visit to full time equivalent worker hour of 0.02, while the most productive had a productivity measure of 1.11 visits per paid-worker hour. Most centres had a ratio of less than one.

Having more full time equivalent staff was positively related to serving more families ($p = 0.06$) and visits ($p=.070$), assuming a statistical significance of a p-value below 0.10. The addition of volunteer workers did not have a significant effect on either measure of output, visits, or families. Visits per family, a measure of service intensity, did not have a significant relationship with full time equivalent staff, with or without volunteer workers. Removing volunteer workers from the equation strengthened the relationship between staff and output, from 0.032 to 0.052 for total visits and staff, and from 0.034 to 0.055 for total families and staff. In either case, an increase in full-time equivalent staff was responsible for 5.2% to 5.5% of the variation in output, respectively (Table 5).

DISCUSSION

We conducted an economic analysis of Parent Link Centres in Alberta in 2013, using data received from the provincial Parent Link Centre program. One of our objectives was to evaluate how well individual centres adhered to the original mission, given that the Parent Link Centres were newly connected from distinct, independent organizations. For the most part, the individual centres followed the Parent Link Centre mandate in integrating standards from the province in offering Triple P parent education, but there was a wide variation in execution in service hours, service, use, and productivity. We looked at centre characteristics, finances, inputs, and outputs for each centre.

Looking at centre characteristics, one of the original mandates was to address the lack of services during convenient hours to accommodate working parents. We found that although there was considerable variation in how opening hours were distributed, each centre had an average of four evening hours per week and only two weekend hours. The wide variation in opening hours is a matter of concern, as fewer hours was related to fewer people participating in programs. This problem is most likely related to fewer full-time staff. More staff led to more families attending and more total visits, though the relationship was small.

By partnering with registered charities, Parent Link Centres were able to add to their existing funding through outside sources. On average, Parent Link Centres added 42 percent to their provincial funding through outside sources when part of a registered charity. The range of funding from the province is constant, with approximately $350,000 allotted to each centre, although this varies between locations. About 40 percent of all centres were registered charities, and these organizations leveraged the given provincial allotment by adding funding from non-governmental sources.

We found a wide variation in service use. Program participation ranged widely, from no participation in programs though they were offered, to several thousand per year in each centre. Some centres performed no developmental screenings, while one centre was providing over 20% of the total screenings for Alberta.

For the most part, the Parent Link Centres appear to be successful in integrating Triple P. We found that only one Parent Link Centre did not provide Triple P services after it was introduced province-wide in 2011, so it is integrated into the vast majority of Parent Link Centres. Out of 266 total employees, half (132) were trained in level 4, or one of the highest levels of Triple P counselling (Table 3). A qualitative study described difficulties that Parent Link Centres experienced in implementing the Triple P parenting program, though most staff (80%) did receive Triple P training (Breitkreuz, 2011). Several Parent Link Centre directors described that the Triple P parent education program has been underutilized. In our sample, an average of 396 families per centre are involved in parent education (Triple P), but with a standard deviation of 765, there is a wide variation between centres (Table 2). In fact, though Triple P is arguably the costliest initial outlay in the Parent Link Centres, relatively few families are using them compared to other services.

In terms of productivity, the range of service varies widely, with each full-time equivalent staff serving 19 families to over 1,500 families per year. We also found that volunteers did not add to the productivity of the Parent Link Centre. This is consistent with another Canadian study indicating that volunteers do not add to the productivity of an organization, but that paid staff and volunteers are somewhat interchangeable in terms of productivity (Mook, 2014). It could be because our direct measure of output- an increase in the number of families attending the centre- did not truly capture the relevant output of

volunteerism. We used a very direct measure of output (families or visits) instead of benefits that are more difficult to measure, such as social engagement, visibility in the community, and other possible benefits of volunteerism. To our knowledge, in the body of literature on volunteerism, there is little to be found from an economics point of view. It would be worthwhile to examine further because of the resources that organizations invest in for recruitment, retention, and supervision of volunteers.

The paper's main weakness stems from the self-reported nature of the data. Quality varies widely depending on the strength personal recollection or the quality of data collection methods in each centre. Some Parent Link Centres were not even aware that such data was to be collected over the year. There is no established method of continuous data collection other than the year-end report. In addition, there is no breakdown of costs per facility, other than those for the 19 registered charities which had to file financial data with Canada Revenue Agency.

We are also using the existing data to provide an economic analysis when it was not the original use of the data. The original purpose of the data collection was to improve program delivery itself, not to execute a cost analysis. Further analysis could be done to determine the aspects of service delivery fueling unit cost. For example, there was a great deal of variability in funding levels. It would be useful to analyze how this affected programming and how this variation came about – characteristics of the organization itself, or from the funding source.

A future study could be strengthened by improving the collection of information from the Parent Link Centres, as well as a more systematic collection of data across all Parent Link

Centres and information from the families themselves. Integrating economic analysis into program evaluation is useful for policy makers and the organizations themselves (Sefton, Byford, McDaid, et al., 2002). This study lays the groundwork for integrating economic analysis into human services, using an example of family resource centres.

To our knowledge, this is the first study to examine the economics of publicly provided parenting education. An initial report on the existing family resource centres in 2004 did not address economic issues. In general, there is a scarcity of economic analysis in the field of human services. The study of productivity and the incentives embedded in funding formulas is widely used in healthcare but not in human services such as parenting supports. Economics can be valuable in human services by providing a framework to evaluate service outputs, and inputs, or the resources required for production.

Table 1 Parent Link Centre and Client Characteristics

	Total	M	SD
Population centres (n=50)			
Rural (<1000)	6		
Small (1000-30,000)	24		
Medium (30,000-99,999)	6		
Large (>100,000)	14		
Organization type (n=49)			
Government operated	31		
Registered charity	19		
Individuals	91,208	1,861.4	1,681.2
Children 0-5	36,549	745.9	524.3
Children 6-17	8,253	165.1	199.4
Families	46,517	949.33	1371.7
First Nations Families	4,398	192.9	685.6
Immigrant Families	3,598	157.1	554.1

Table 2 Parent Link Centre programs and participation

Programs (n=48)	*Total*	*M*	*SD*
Total visits	122,386	2,549.7	2967.0
Early Childhood Development (# families)	62,762	1,280.9	1,882.0
Parent Education (# families)	19,433	396.6	764.7
Family Support (# families)	21,268	434.0	753.0
Information Referrals (# families)	14,422	288.4	878.0
Screenings (# children)	6,174	123.5	187.6
Flagged for delay (#children)	706	14.41	13.38
Print materials	496,449	10,131.6	21,654.4

Table 3 Parent Link Centre Resources: employees and hours

(N=49)	*Sum*	*M*	*SD*
Total visits	122,386	2549.7	2967.0
Personnel			
Total paid staff (FTE's)	266.1	5.3	2.0
Highly trained staff (Trained in Level 4 Triple P)	132.0	2.8	2.0
Total volunteers	8,666	180.5	319.9
Employee Hours			
Full time equivalent hours	44,216.0	921.1	1,189.7
Volunteer hours	34,253.0	713.6	1,073.3
Hours of operation			
Total annual hours	139,055	2837.9	2323.4
Weekday hours	124,682	2544.0	2143.4
Evening hours	9,349	190.7	232.4
Weekend hours	5,024	102.5	110.4

Table 4 Productivity measures: output per worker hour

(n=48)	*Mean*	*SD*
Visits per FTE hours	0.24	0.24
Visits per volunteer hours	17.32	43.34
Families per FTE hours	182.60	228.90
Families per volunteer hours	6.02	12.10

Table 5 Centre output as a function of worker input

	β					R^2
	Constant	Total paid staff (FTE's)		Volunteers		
		β	p-value	β	p-value	Equation p-value	
Families	431.1	93.8	0.063	-0.046	0.942	0.174	0.034
	425.0	93.4	0.06			0.06	0.055
Visits	1471.6	194.1	0.08	0.438	0.75	0.188	0.032
	1530.4	197.8	0.07			0.07	0.052
Visits per family	3.6	-0.016	0.878	-0.001	0.59	0.844	-0.038
	3.6	-0.022	0.83			0.83	-0.022

Table 6. Total, average, and provincial funding for Parent Link Centres

(n=44)	*Sum*	*M*	*SD*
Total Funding	$ 19,875,126	$ 451,707	$ 354,319
Provincial funding	$ 13,843,586	$ 314,626	$ 112,592
Average funding (per family)	$ 33,950	$ 772	$ 859

CHAPTER 2. COST FUNCTION ANALYSIS OF FAMILY RESOURCE CENTRES

Introduction

Organizations in human services have been increasingly required by funding agencies to account for their activities and the associated spending (Alberta Human Services, 2011). Though this increases the administrative burden on Parent Link Centres, there are few structures in place to evaluate spending and outcomes in a way that is comparable between agencies and programs, as in health economic evaluations.

Parent Link Centres are family resource centres that provide parenting support activities and education throughout Alberta. At the time of this paper, there were 50 throughout the province. This program can be considered a public health intervention, with a goal of elevating child and family mental health throughout the province. Parent education in Parent Link Centres has many similarities to the delivery of public health services, in that it is a collection of services designed to have an impact on the health of the entire population (Sanders, 2008). Unlike public health centres, however, funding is provided as a lump sum rather than per visit. As a result, there are wide variations in the operation between Parent Link Centres.

The mix of programs offered varies widely between centres. The production process that Parent Link Centres follow is heavily oriented towards the use of labor and includes the use of both paid personnel and volunteers, from parenting workshops to intensive one on one counselling. There is a large range in the scale of operations, measured by the numbers of

families served, in the types of staff, numbers of volunteers and training of paid employees, and in other organizational features.

There is also a wide variation between centres in average cost, shown in Chapter 1. According to annual returns filed by Parent Link Centres with Alberta's provincial human services department in 2013, the average Parent Link Centre spent $339 per family, with a standard deviation of $348. The Parent Link Centres with the lowest unit cost had a cost per family of $19 while the highest was operating with a unit cost per family of $1,552.

Cost function analysis is an area of health economics that explains variations in service cost by measuring the relationship between cost and its influences (Knapp, 1984). Cost function studies have seldom been used in human services settings, though we found examples in K-12 education (Imazeki, 2008) and a review of children's care services (Beecham, 2006).

Cost function analysis is more commonly used to examine the efficiency of healthcare delivery. In an analysis of child health service clinics, cost was related to ownership (government versus non-profit), quality of care, salaries, and case mix (Johns, Munthali, et al., 2013). Case mix, originally developed for hospital reimbursement, is a measure of patient or client needs which increase the cost of treatment (Breyer, 1987). In a study of methadone clinics, there was a dimension of "urbanicity"/population density added to their cost analysis (Dunlap, Zarkin, & Cowell, 2008). In a Dutch study, in which all residential facilities were not-for-profit entities, an increase in labor costs led to a reduction in quality (Blank & Eggink, 2001). A review article in the cost variation of children's care services (social work support) identified similar categories such as input prices, location,

partnerships with other organizations, quality, and increased needs of the client (Beecham, 2006).

All studies used facility-level data in their analyses, rather than individual client-level cases; this enables better cost comparisons between providers (Knapp, 1984). As in the above examples, we hypothesize that the costs will be affected by factors including the scale of operations, quality, case mix, and resource sharing, which includes a measure of ownership of the centre.

The objective of this paper is to track resource use in Parent Link Centres in Alberta using a cost analysis, applying techniques usually found in health economics to activities in human (i.e., social) services.

METHODS

Data source

We analyze information on Parent Link Centres provided by the Alberta Human Services department through a year-end report of the centre directors from 2012-2013. This report contains facility-level data which is not individualized, and so clients remain completely anonymous. Each Parent Link Centre reports statistics on the number of families served, the percentage of programs utilized, as well as characteristics of the centre itself. Aggregated client information was collected for each of the Parent Link Centres from administrative information and the year-end report.

Using the postal code of the main Parent Link Centre, we used the Statistics Canada Census and the National Household Survey to determine location-specific information, such as the prevalence of poverty and the population in the area of the Parent Link Centre. We

used the most specific information available from Statistics Canada. For the designation of rural and urban areas, we used the definition from Statistics Canada Census, which defined a population centre as an area with a population of at least 1,000, with 400 or more people per square kilometer. All areas outside of these population centres were designated as rural (Statistics Canada, 2014). The National Household Survey was used to determine the prevalence of poverty in the areas of the Parent Link Centres. We used the prevalence of low income in 2010, based on the after-tax low-income measure for the most specific geographic area available, which was the federal electoral district (Statistics Canada, 2017).

Dependent variable: Average cost

The dependent variable is the average cost per family, which is the total operating cost per centre divided by the total number of families that come to a Parent Link Centre per year. As noted, there are considerable differences in average operating cost between Parent Link Centre units. We expected total cost of operations to increase proportional to increased funding of the centre. This may have more to do with external factors such as fundraising, location, etc. As such, we used average cost in this cost analysis. This measure is used to reflect more accurately the intensity of resource use per family, which has more to do with internal practice of the individual Parent Link Centre itself.

There is no itemized data for facility costs, other than those that are charities registered with Canada Revenue Agency (CRA). Through these available financial statements, we estimated that personnel salaries make up an average of 71% of the variable costs of charitable activities and administrative costs. We did not have any operating cost information for centres which were not registered charities, but we estimated the costs for all centres by multiplying the number of full-time equivalent staff by the mean salary of social

and community service workers in Alberta. The mean annual salary of social and community service workers in Alberta was approximately $35,000 (Alberta Learning Information Service, 2017).

Scale of operations: Number of families

Using the dataset from the Parent Link Centres, we used their definition of "parents" as our variable for the number of families. We counted families rather than children as the output, as our assumption is that one parent was coming in with several children. If economies of scale exist, more families will result in a lower average cost for the facility. Thus, the number of families is a key explanatory variable in our analysis.

Quality: Triple P investment (staff and family)

Quality is difficult to measure, and there is little consensus between studies as to its definition in healthcare (Yildiz, 2014). Quality measures other than direct outcomes such as "health" can be considered intermediate measures, whose value is determined by their connection to the outcome goals (Knapp, 1984). We measure the quality of services as the level of investment that the centre has with the Triple P program, a specialized parent education program available in all 50 Parent Link Centres.

We use two measures – level of staff training in Triple P and family involvement in the program as measures of structural and process quality. Structural quality involves factors such as staff/ patient ratios as in healthcare quality (Donabedian, 1988). In our case, we use the percentage of staff specially trained in Triple P as a ratio to regular employees. Measures of process quality involve the way services are delivered. In our case, we use the number of families involved in Triple P as a reflection of the "quality of care" that families are receiving

in the center, as Triple P is an evidence-based intervention with measurable, positive outcomes. We measure the level of staff training by a ratio of Triple P practitioners to full-time equivalent staff. We chose to have a ratio of Triple P trained staff compared to regular staff as a level of quality of the facility itself. Using a ratio of Triple P staff to families, for example, will be affected by the variation in the number of families using the center, which can be affected by location and other factors.

This special training in Triple P parenting education is provided by the provincial government. Training staff in Triple P techniques cost a total of $192,153 (in 2011) in initial outlay, covering materials, the actual training, and licensing to use Triple P, and this expense is borne by the province (Escober Doran, Jacobs, & Dewa 2011). This fixed cost is not included in our analysis, but we expect more highly trained staff (staff trained in Level 4 Triple P) to translate into a greater average cost per centre. We also include the number of individuals using Triple P services as a percentage of total families coming into the centre. Triple P sessions are resource-heavy, requiring more staff time. We predict that more families using the Triple P program will also result in a greater average cost for the Parent Link Centre.

Case mix: Rural location

In health economics, "case mix" refers to factors that generate a greater cost for the healthcare provider because of their higher needs and increased resources required to care for them. We hypothesize that because of the cost of setup and possible increased needs of the population, being in a rural location will result in a higher average cost.

Because the Parent Link Centre reports did not include individual demographic information that would be a more direct measure of case mix, we use rural location to group together several measures of vulnerability. In health care, people in rural communities are less likely to access preventive health services (Casey, Call, & Klingner, 2001). There are several Parent Link Centres in Metis settlements, though all the centres are off-reserve (Alberta Human Services, 2018), but most centres with a high population of First Nations clients were also located in rural areas. Because the sample is relatively small (n=50), we did not want to use all of the measures of vulnerability separately but rather combine them into a single group with which they were correlated. In addition to the decreased likeliness of accessing health services and a large First Nations population, rural locations were correlated with low income in our sample.

We determine the value of this variable by finding the postal code of the main Parent Link Centre location listed on the centre report. Using the postal code, we found Statistics Canada census information for the population density in the area of the centre (Statistics Canada, 2014). Based on the designations from Statistics Canada, we define a rural area as a postal code with less than 1,000 people (Alberta Municipal Affairs, 2014).

Resource sharing: Registered charity, Volunteers/ FTE

Service production includes factors that augment the existing resources of the centre, due to the sharing of resources with a larger organization. A major factor is whether the centre belongs to a charity registered with the Canada Revenue Agency, making the centre able to raise funds through donations and fundraising. Being part of a larger organization also takes much of the administrative responsibility and cost away from the individual Parent

Link Centre. We hypothesize that this will lower the average operational cost of the facility, as overhead costs can be spread throughout the larger facility.

Registered charities may also be able to recruit more volunteers. We expect that the more volunteers augmenting the workforce, the lower the average cost, as with registered charity status, making the Parent Link Centre less dependent on paid employee costs. Although we found that productivity was not affected by volunteers using our measures in Chapter 1, we will examine whether there is an effect on average cost in this case. We measure this by volunteer hours per full time equivalent staff.

We will perform regressions using the following model:

$$\text{Average Cost} = C + \beta_1 (\text{Number of families}) + \beta_2 (\text{Triple P/ staff}) + \beta_3 (\text{Triple P/ families}) + \beta_4 (\text{Rural status}) + \beta_5 (\text{Volunteer/ FTE}) + \beta_6 (\text{Charity status})$$

The predictions of our model are summarized in Table 7. Based on previous studies, our predictions include economies of scale, that an increase in the number of families attending the centre will lower the average cost. We also predict that case mix (rural location) and resource sharing will reduce average cost. We expect that an increase in the quality of services in the centre, measured by staff and families involved in the Triple P program, will increase cost (Table 7). Linear regression was analyzed using the ordinary least squares method, using Excel 2016 and SPSS 23.

RESULTS

Descriptive Statistics

The average cost per family in the sample of centres was $339, with a range of $19 - $1,553 spent per family in each Parent Link Centre. The number of families served in each centre annually also had a wide range, from 39 to 9,498 families per year. There were 19 charities registered with Canada Revenue, with the remaining 31 either unregistered with the CRA or entirely government-operated. There was an average of 121.6 volunteer hours per full time equivalent staff member, translating into an equivalent of over 2 extra full workweeks per year. There were 6 out of 50 Parent Link Centres which were in rural areas with less than 1,000 people in the postal code area. Rural locations are correlated with a greater percentage of self-identified First Nations individuals (Pearson correlation = 0.592, p=0.00) and with a high prevalence of low income (0.267, p=0.061).

An average of 87.7% of staff was trained in any level of Triple P parenting education. The percentage of families involved in the Triple P parenting education program was 16.5%. This range was from 0 to over 100%, because a single family could participate in several Triple P programs at once.

The sample showed a normal distribution (K-S test for normality $p>0.05$). There were no significant correlations found between the following variables: rural status or measures of quality (Triple P/ staff, Triple P/ families, or Volunteer/ FTE). There was a correlation between Charity status and Rural status. It remained in the equation because we believe that, separately, there would be an effect on average cost. The connection between Charity and Rural status will be discussed more in Chapter 3.

Regression results

We tested three separate models in our analysis.

In all three models of the equation, four basic variables were included – the number of families, Triple P trained FTEs, Triple P families, and rural location. In Model 1, volunteer hours per FTE were included, but this variable did not prove to be significant. In Model 3, only registered charity was included, and in Model 2, the final model, neither measure of resource sharing – registered charity or volunteer hours per FTE - were included. Removing both measures of resource sharing led to the final model (Model 2), which included the four basic variables – the number of families, Triple P trained FTEs, Triple P families, and rural status (Table 8).

We determined our final model as follows:

$$Average\ Cost = 334.71 - 0.047\ (\text{Number of families}) - 1.489\ (\text{Triple P/ staff}) + 6.492\ (\text{Triple P/ families}) + 601.2\ (\text{Rural status})$$

Number of families

In terms of economies of scale, the coefficient for number of families varied between 0.041 and 0.047 but was only significant at a level of 0.085 in Model 2. An increase in the number of families by 10 in each centre was associated with a reduction in average cost per family of $4.70. The centres had an average number of families at 998 and an average cost of $339, so at the mean, an increase of 10 families would only lower costs by $4 per family. Increasing services to more families had a very little effect on average cost.

Quality: Triple P investment (staff and family)

We measured quality by the centre's involvement in the Triple P program by staff specially trained and the number of families participating in the program. More families participating in the Triple P program raised the cost, as expected. An increase by a single percentage point of families from the mean of 16.5 percent to 17.5 per cent increases the average cost from $339 to $345.

An increase in highly trained staff *lowered* the average cost. An increase in one percent of Triple P trained staff, for example from the mean of 87 per cent to 88 per cent, is associated with a decrease in the average cost from $339 to $337. We hypothesized that an increase in centre involvement in Triple P would be associated with an increase in average cost because of the cost to train staff and implement the program, but this does not appear to be the case.

Case mix: Rural location

The greatest cost driver was rural location. Rural locations are associated in our sample with a greater concentration of First Nations individuals and an increased prevalence of low income families. Being in a rural location raised the average cost per family by $601, a substantial amount, considering the average cost was only $339. This was contrary to our predictions, which was a lower average cost for rural locations.

Resource sharing

We tested for two alternative variables in the resource sharing category – the number of volunteers per FTE and whether the centre is part of a registered charity. In neither case was there a significant impact on average cost.

DISCUSSION

Using a cost function analysis, we examined the economic behaviour of Parent Link Centres in Alberta. For an expanding service like the Parent Link Centre program, cost function analysis is a useful tool to predict the cost to optimize program operations (Johns, Munthali, Walker, et al., 2013) (Beecham, 2006). In our case, a cost function analysis determined the strength of factors in the production of parenting education.

We can divide the explanatory variables into two groups – those that reflect centre policies and those that reflect characteristics of the centres. The variables that reflect centre policies include Triple P variables (employees and families served), volunteer hours and the scale of operations. Centre characteristics include the rural / urban status of the centre and registered charity status of the centre.

Rural status had by far the greatest effect average cost per family, nearly doubling the cost per family, holding all other factors steady. More resources on average were being spent on rural centres, which served more First Nations families in locations with a greater prevalence of poverty. Parent Link Centre funding allocated 15% of the total budget to rural locations, though there were only six rural locations with a population of less than 1,000. This is consistent with work in the US indicating that government funding through contracts concentrates in areas of need (Marwell & Gullickson, 2013).

Rural locations appear to have higher average costs because there are fewer families attending the centres, as the measure for average cost is Total Cost (based on the number of staff)/ number of families. I would argue that the finding does not suggest that it is too expensive to operate rural centres or that it does not provide "value for money," but implies that they may be *underutilized*. Further research could explore possible barriers to access.

With regard to management decisions, the provision of Triple P services has the greatest impact, but not in the predicted direction. Staff training in Triple P parent education did not increase the average cost of the centre, but it still led to more parenting programming being offered. This is in line with a cost function analysis of services for people with learning disabilities in which hiring more educated nurses raised the initial, total cost, but lowered the average cost (Shiell, Pettipher, Raynes, et al., 1993).

Other results were unexpected. For example, greater use of volunteers was expected to lower costs, but it had no significant effect. This may be because volunteers do not perform educational or administrative functions. This is in line with Chapter 1, which indicated that volunteers also had no effect on productivity, measured by the number of families served.

We also expected that a centre which was part of a larger non-profit organization would lower the cost, because of the sharing of administrative costs. This was not the case, and in fact, it had no significant effect on costs in either direction, but the effect of registered charities for Parent Link Centres should be investigated further.

The analysis had several limitations, the first being our small sample size of 50 centres. However, this dataset was the entire population of Parent Link Centres - we were

focusing on facility-level data, and the sample included every facility. The information was self-reported from each Parent Link Centre at the end of the year, likely leading to some reporting inaccuracies.

Because of our relatively small sample, we were limited in the number of variables to include. We did choose variables which we believed would have more of an effect on the average cost. Also, not all costs were captured because of the lack of itemized cost data for the centres which were not registered charities. However, as stated in the introduction, our analysis of the data for registered charity centres showed that 71% of facility costs were allocated to staff compensation. Therefore, we feel confident that by estimating the costs based on the number of staff and estimated compensation captured most of costs for both types of centres. Even given a limited data source, we were able to track resource use using cost function analysis, an effective tool for planning both in healthcare and human services.

Table 7. Expected signs of independent variables for average cost

Theoretical variable	*Expected sign*	*Measure used*	*Method of measurement*	*M*	*SD*
Average cost		Cost per family	Cost / Families		
Scale of operations	-	Families	"Parents" in survey	949.3	1,371.7
Case mix	+	Rural location	StatsCan based on postal code: population less than 1,000	0.12	0.33
Quality	+	1) Percent Triple P families	Total Triple P individuals/ families	16.5	21.0
	+	2)Highly trained staff	# staff trained in Level 4 Triple P/ #FTEs	87.7	89.3
Resource sharing	-	1) Volunteers per FTE	# volunteers/ # FTEs	121.6	124.0
	-	2) Registered charity status	Charity registered with Canada Revenue Agency	.38	.49

Table 8. Results of regression for average cost

	Model 1		Model 2		Model 3	
	β	p-value	β	p-value	β	p-value
Constant	388.9	<0.000	334.71	<0.000	355.218	<0.000
Number of families	-0.042	0.12	-0.047	0.085	-0.041	0.14
Triple P/ staff	-1.5	0.007	-1.49	0.008	-1.63	0.008
Triple P/ families	6.06	0.017	6.49	0.011	7.079	0.009
Rural status	578.4	<0.000	601.2	<0.000	601.7	<0.000
Volunteers/ FTE	-0.38	0.19				
Registered charity status					-55.083	0.49

CHAPTER 3. NON-PROFIT AND GOVERNMENT PARTNERSHIP IN ALBERTA

Introduction

Research from the past several decades shows that charity or non-profit and government-operated organizations behave differently regarding the services that they supply. Much of the comparison between for-profit firms and not-for-profit organizations has focused on healthcare organizations (Newhouse, 1970). For-profit, not-for-profit, and government hospitals offer a different combination of services based on economic pressures (Sloan, 2000). For-profit hospitals, for example, are more likely to concentrate on the provision of "profitable" services with more predictable courses of care. An example is open heart surgery, in which the hospital receives a financial return for their investment. Government-run hospitals are more likely to offer "unprofitable" services, such as burn units, with non-profit hospital behaviour falling in between (Horwitz & Nichols, 2009).

Economic theory can predict these differences in behaviour based on different economic incentives. One of the earliest and most fundamental theories in non-profit economic behaviour is Newhouse's quality-quantity model (Newhouse, 1970). Decision makers in the organization decide the balance between quality and quantity to maximize utility. For example, government suppliers may provide lower quality products compared to for-profit firms. Government supplies may orient their provision towards more visible components of output which are easier to measure and report, such as number of people attending a Parent Link Centre, economizing on less visible product characteristics. These less visible characteristics are often linked to quality, affecting for-profit firms, which are more sensitive to market forces (Lindsay, 1976). An

example of less visible, quality-oriented product characteristics may be the facilitator's emotional competence when interacting with a family. While clearly contributing to a better quality and, arguably, outcomes of the Parent Link Centre, these are difficult to measure and may not be rewarded by higher funding.

Weisbrod expanded on Newhouse's model by explaining the role of non-profits as an alternative to for-profit goods. Because of the diversity of consumers, there are differences in the demands for quality for the service and the ability to pay for this higher quality (Weisbrod, 1975). Hansmann (1980) expanded this further by describing the "three sector economy," in which government, non-profit, and for-profit firms provide a service. Decision makers in each type of service maximize utility with a different mix of quality and quantity output. Put simply, governments can provide the public good without charge, non-profits can provide a higher quality service, and businesses can provide services based on market demand, each maximizing their own utility (Steinberg, 2006).

Compared to government providers, non-profits have more flexibility in funding sources, with additional revenue coming from donations (Hansmann, 1980). There has historically been tension between the non-profit organizations and government funding organizations (Norris-Tirrell, 2014). Nevertheless, governments have steadily decreased their direct provision of services in favor of funding existing non-profit organizations (Salomon, 1995). This pattern of non-profit/government partnership for human services has been true in Canada, where there has been a fifty-year history of publicly provided healthcare.

In Alberta, Parent Link Centres are organizations either independently operated as charities or as government owned entities (Canada Revenue Agency, 2016). When they were

founded in 2004, Alberta entered partnerships with existing not-for-profit family resource centres, some of which were registered charities, to implement the program. Since that time, Alberta has established centres primarily operated by the provincial government.

In Canada Revenue Agency terms, there are two types of not-for-profit organizations- registered charities and non-profits. Agencies with charitable missions in Canada such as providing family supports must register as a charity to maintain their tax-exempt status. Organizations with no charitable mission, a hobby club, for example, would not register as a charity. One of the major differences between non-profit agencies in Canada is that charities can issue official donation receipts, while non-profit entities cannot, the assumption being that revenues will increase the number and/ or amount donated as a result (Canada Revenue Agency, 2016). While both are exempt from paying taxes, charities must have a stated, charitable mission and spend a designated percentage of their revenue on these activities. Because "non-profit" in the literature is usually used to describe "registered charities" as defined by Canada Revenue Agency, we will refer to registered charities as "non-profit" organizations for the rest of the paper.

Parent Link Centres are either registered with the Canada Revenue Agency as a charity or operate solely as a government-owned operation. Charities registered with the Canada Revenue Agency are required to file a financial statement and are required to spend a certain percentage of resources on their stated, charitable mission. In return, they can obtain fundraising from private, outside sources, and can provide receipts for tax deductible donations. Government centres are funded by Alberta and report to the government of Alberta. Their funding amount remains constant, once a disbursement from the province has been established (Alberta Human Services,

personal communication, 2014). Because of these two types of ownership structures, the two organizational types may face different incentives affecting their economic behaviour.

Parent Link Centres find themselves in the unique situation of being a single organization with two types of governance: centres which are entirely operated and funded by the government, and non-profits (registered charities), partially funded by the government and operated by the larger non-profit organization, such as the YMCA. This sets up a natural experiment. Alberta Parent Link Centres are ostensibly operating with the same target population and mission, but may, in fact, be providing services with a different quality/ quantity mix to maximize utility consistent with their organizational structures.

Newhouse described quality in terms of a "vector" of characteristics (Newhouse, 1970). Optimal outcomes are a mix of quantity and quality outputs, but with a greater emphasis on quality characteristics. Quality measures other than outcomes can be considered intermediate measurements, whose value is determined by their connection to the outcome goals (Knapp, 1984). These intermediate quality measurements include the organization's structural and process quality. The structural quality of the organization includes resources, staff, and organizational aspects of the facility. Process quality is a measurement of the process of "giving and receiving" care, part of which is adherence to the organization's own program goals (Donabedian, 1988).

Under the umbrella of a single organization of Parent Link Centres of Alberta, we predict government and non-profit centers will differ in economic behaviour because of the two separate governance structures. Because of their varied funding sources, we expect Parent Link Centres which are part of a larger non-profit to receive more total funding and to have a smaller

percentage of this funding coming from the government. We hypothesize that non-profits and government organizations both maximize their utility within a budget constraint, non-profits by providing higher quality services and government organizations by providing a greater quantity of services at a lower quality, based on Lindsay. All centres have ostensibly the same goals – to provide parent education and support to families at risk - but each centre is either government-operated by the province or part of a larger non-profit organization. One of our goals is to see how these alternative incentive structures translate into different intermediate measures of quality and outputs for government centres versus non-profit centres.

METHODS

Data sources

Each centre that accepts provincial funding from Alberta submits a year-end report to the Alberta Human Services Department. The report for 2012-2013 contained anonymized, aggregate data for each centre. We obtained financial reports for 50 Parent Link Centres. For additional information, we used the postal code of the main centre, which might have satellite locations, to obtain data from the Statistics Canada census and national household survey for 2012.

Registered charities are listed on the Canada Revenue Agency charities website and must fill out a T-3010 federal tax form. Registered charities were identified by searching by name on the Canada Revenue Agency website. Out of 50 Parent Link Centres listed in the year-end report, 19 were charities registered with Canada Revenue Agency, and 31 were operated by the provincial government, which we inferred from their absence from the registered charity list.

Information on the year end report included the total number of families who visited each centre, counted only once during the year, and total visits. Because we assume that one primary caretaker makes the decision to bring children to the centre, we consider the number of parents in the dataset as families. Monetary information included total revenues, or the intake of monetary resources for the organization, including the provincial grant, donations, and miscellaneous other revenues. Costs, or itemized expenditures of each centre, were not recorded on the year end report.

All centres seek to maximize their utility, which is a combination of quantity (number of families) and quality. For each centre, we examine intermediate measures of quality: structural quality and process quality. To look at structural quality, we use the year end report to compare the number of full-time equivalent staff between the two types of centres, and the percentage of staff specially trained in Triple P parenting education. We also use the year end report to examine process quality, which we define as service intensity, or visits per centre.

Centres will seek the highest output they can, subject to their revenue constraint. We expect non-profits to secure additional outside funding and be less reliant on government funding. We hypothesize that non-profit charities maximize utility by providing higher quality service and consequently spending more on average per family. By contrast, we hypothesize that government operated centres will provide a greater quantity of output, measured by number of families and serving families at risk, the main program goal of Parent Link Centres (Lindsay, 1976). By their definition, this includes families of Aboriginal background. We expand this notion to include families living in poverty, measured by the poverty level in the postal code of the main Parent Link Centre.

Model

Revenues for government Parent Link Centres come solely from provincial grants (See Figure 2, where GRANT represents the government grant). This grant from the province of Alberta is assumed to be the same for non-profit and government centres, based on personal communication from Alberta Human Services. Operating costs have fixed and variable components, represented as Total Operating Cost in Figure 2. We hypothesize that government centres are output maximizing entities, and will use their given budget, producing at a volume of output where there are no surpluses, which is point Q_1 in Figure 2.

Non-profit centres can raise funds in addition to the government grant. Fundraising yields charitable donations which adds to revenues, resulting in a total revenue depicted by the curve (GRANT+Net Fundraising). A non-profit charity will, therefore, have greater revenues, despite the greater fund-raising cost. We also assume that the non-profit centres are utility maximizers. In this case, if the quality remains the same, then the increased revenue will allow it to produce at point Q_2. If charity revenues are greater than the fundraising cost, we assume that the non-profit will continue to engage in fundraising activities. We assume that net charity revenue is constant and does not change with increased output.

In testing the model, we use a t-test to determine if there is a significant difference between the basic government grants paid to the two types of centres, with 0.10 set as the level of significance. Using the t-test to compare means has been shown to be valid for health economics, even with small samples (Thompson & Barber, 2000). In addition to the t-test, and because the sample size is relatively small and the variation between centres large, we expect to obtain less statistical significance, though all variables displayed linearity. Considering this, we also include measures of effect size, which focuses rather on the absolute difference between two

variables. We follow Cohen's general rule with 0.2 representing a small effect size, 0.5 medium, and anything over 0.8 considered a large effect size (Sullivan & Feinn, 2012).

We next test for differences in total revenues, including donations, to the two types of centres. If there is no difference in government grants but a difference in total funds, we may conclude that charities have benefited from fund raising activities. We then test for differences in output between the two types of organizations. Output is separated into two components: quantity, measured by families served, including at-risk groups, and quality of output.

In summary, we hypothesize that:

1. Total revenue for the non-profits will be greater than government revenue.
2. Non-profits will orient their output towards quality, resulting in greater average funding per family and other quality indicators.
3. Government centres will orient their output towards quantity, serving more families, including high risk groups.

RESULTS

Resources for non-profits are reported only for the Parent Link Centre activities and not for the larger registered charity under which the centre was operating.

Test 1

We hypothesized that total revenue for non-profits will be greater than government revenue as a result of being able to raise funds from different sources. The provincial grant did not differ significantly between the ownership types and had a mean of $307,240.25 for all centres. Total funding for Parent Link Centres, however, differed significantly, with government centres averaging $345,969 in revenue compared to $590,837 for registered charities ($p = 0.043$).

Using the financial reports from the Parent Link Centres, we found that all centres received government grants as their main sources of income (Table 9). Government centres were more dependent on this income, however, with 92.9% of their revenue from the provincial government compared to 76.5% of non-profit revenues ($p = 0.041$).

We could not determine exactly how this extra funding was utilized, as costs for government operated centres were not publicly available. Also, financial reports for registered charities/ non-profits represented the budget of the larger organization and not only the Parent Link activities. Non-profit centres had significantly greater total revenue compared to government centres, however, so we next examined the differences in quality and quantity between the two organizations.

Test 2

We hypothesized that non-profits would maximize quality over quantity, reflected in a greater average funding per family and other quality indicators. In fact, we found no difference in average funding per family between the two types of organizations ($714.50 per family). We looked at three intermediate aspects of quality – service intensity, or visits per family, number of employees, and staff education. Based on these factors, non-profits did not maximize quality compared to government centres.

Visits per family were not significantly different between non-profits and government centres, with both providing approximately three visits per family every year. In staff education, government centres had the advantage, with 100% of government staff trained in Triple P parent education compared to 67.1% of staff in non-profit centres. However, this difference was not statistically significant and had a small effect size. Non-profit Parent Link Centres did, however,

have nearly double the number of full-time equivalent staff (7.34) compared to government centres (4.09, p=0.02) (Table 9).

Test 3

We hypothesized that government centres would maximize quantity at the expense of quality. However, we found that they did not serve more families than non-profit centres. Non-profit centres served more total families, though not at the .10 level of significance and a medium effect size, with an average of 1,410 families per year compared to 641 for government centres ($p = 0.13$) (Table 9).

Government Parent Link Centres were, in fact, more likely to serve families at risk. In government centres, 31.2% of clients identified as First Nations compared with 10.9% of families in registered charities ($p<0.03$). The seven centres serving entirely First Nations families were all government-operated. Government Parent Link Centres were more likely to be in an area of deprivation, with an average of 9.7% of families living in poverty, based on the postal code of the Parent Link Centre location. By contrast, none of the registered charities were in areas of poverty.

DISCUSSION

Parent Link Centres operate either as government entities or as non-profit charities, providing public parenting support and education. We hypothesized that these two types of organizations would behave differently to maximize their utility, given their budget constraint, with non-profits providing higher quality and government centres providing more quantity.

Both types of organizations maximized the number of families served, given their budget constraint, but non-profits could serve an average of more than twice the number of families

compared to government centres. Both received similar grants from Alberta of about $350,000 per year, but non-profits effectively doubled this grant, supplementing their revenues through fund-raising and other sources. We infer that these increased resources were parlayed into hiring more staff and serving more families.

Compared to non-profits, however, government centres served more families at risk. Using the measures we had available, we defined this as Aboriginal families and being in an area of poverty. Across the province, fully one third of individuals attending government Parent Link Centres identified as Aboriginal, and several centres had a clientele which was entirely Aboriginal. Government centres were also more likely to be in an area with more than 40% of the population living in poverty.

There is no evidence that non-profits maximize their utility by increasing quality, using our measures. There was no significant difference in average funding per family. In structural quality, which we defined as number and education of staff, non-profits did have nearly double the number of staff, on average, compared to a government centre. While we could not determine exactly how extra funding was spent, we can assume that charities used a portion of their extra income to hire more staff. In staff education, our other structural quality measure, we found no significant difference in highly trained staff. It is noteworthy that 100% of workers in government centres were specially trained in the Triple P parenting program. In process quality, there was no significant difference in service intensity measured by visits per family. We can infer that non-profit centres focused their extra resources on drawing in more families, but not providing more services per family. Further research could shed light on whether there are significant differences in service delivery between government and non-profit centres. It could be that they were in fact performing different services. Currently, each service received is only

counted as a "visit," with no information as to the time spent in each centre, the "intensity" of interactions with the family – casual playgroup with other parents vs one-on-one counselling session.

Non-profit centres have the advantage of flexible funding sources, with revenue sources coming from taxes, fundraising, donations, and the ability to charge for services. Government organizations' only finance source is from taxes, so, by comparison, the non-profit is more financially secure (Bills and Glennsterner, 1998).

Non-profit organizations benefit from multiple funding sources, but these same benefits may pull them away from Parent Link Centre goals, which is to support vulnerable young families. Parent Link Centre activities represented only a small part of the larger organization. Within the nineteen registered charities, the portion of their total funding allocated to Parent Link Centre activities was only 10.7%, while the government centres were exclusively dedicated to Parent Link Centres activities.

The reasons for a government initiative to partner with an established non-profit is well-established. One is the relative ease of contracting with a stable non-profit that has proven to provide quality services instead of starting a brick-and-mortar centre from scratch (Jones, Meegan, Kennett, et al., 2016). Non-profits that are financially stronger are simply more likely to survive (Twombly, 2003). Another advantage of non-profits is that they are perceived to be quicker to respond to community needs than government agencies (Billis and Glennsterner, 1988). Our sample found that fundraising efforts were able to double their revenue, which affected (more visible) output by hiring more staff. However, it could be argued that non-profits, with an increased ability to raise funds, have other less positive effects on service.

Voluntary organizations, though they may be financially stronger and quicker to respond, may provide services based on reasons other than community needs, however. Reliance on personal and corporate donations, while making them less financially vulnerable, means that funds may be distributed unevenly. This *philanthropic particularism* results in more private support going to organizations based on their social attractiveness or simply because they are more visible (Salamon, 1987). Areas which are more deprived in terms of income, housing, and other measures, are more susceptible to funding cuts to begin with and have less of a chance of survival when cuts do happen (Clifford, 2012). This holds true in our study, which had fewer non-profit centres in areas of poverty or serving Aboriginal families. Perhaps establishing a centre in an area of poverty may make the survival of a non-profit, which is more dependent on donations, more difficult if not impossible.

This study has several limitations. We used a data set based on self-reported data. Results were not audited or verified, and so it is possible there were errors. Further, we only had data for one year; with data from additional years, we could have made stronger inferences. More detailed financial data was not available for government operated centres, so other sources of funding are unknown. However, because they do not have the ability to provide tax deductible receipts for donations, we assume this restricts major fundraising.

Our sample size is relatively small, with only 50 Parent Link Centres. However, this represents all the centres, so it represents the entire population of interest. This dataset allowed us to directly compare the two organization types in a controlled environment, much like an experiment. Parent Link Centres provide a unique view of an evolving organization and the costs and benefits of government partnerships with non-profits.

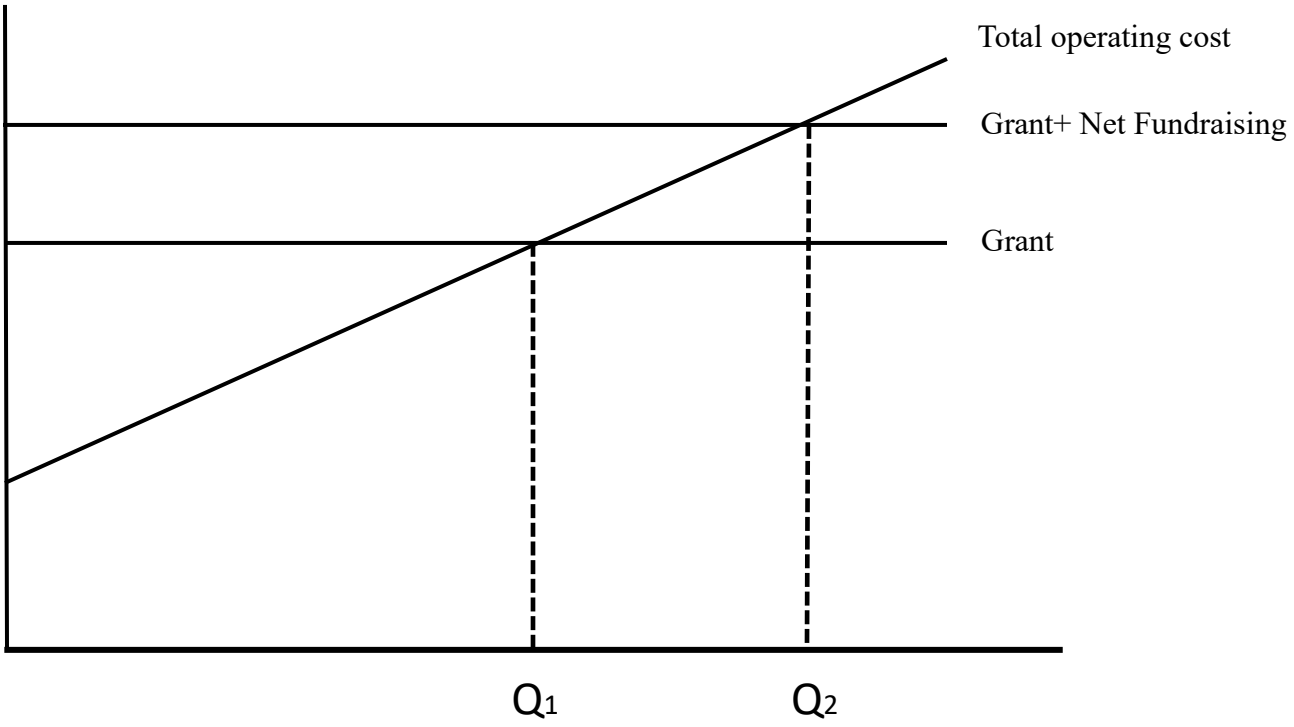
Alberta can greatly expand the reach of Parent Link Centres by connecting with existing voluntary organizations. The results tentatively support the hypothesis that partnering with a non-profit allows certain centres to pursue additional funding through fund-raising. This additional funding appears to be directly related to expanding operations by hiring more staff and serving more families. On the other hand, government centres, with their independence from fund-raising or various stakeholders, can provide services in areas in which it is difficult for non-profits to operate. In this case, government centres may be in a better position to serve the most vulnerable families. Under current government funding in Alberta, incentives (e.g., unit funding) are not used to fund human service programs, unlike public health programs. This partnership makes it possible for the government to support more families, effectively doubling its investment, which is a virtue in times of public funding shortages.

Table 9. Parent Link Centre finances and output for government centres and registered charities

	All centres (n=50)	Registered charity (n=19)	Government centre (n=31)			
Finances	M	M	M	SD (pooled)	Effect size	p-value
Provincial funding	$ 307,240 ($113,666)	$ 327,079 ($96,878)	$ $294,243 ($123,335)	110,604	0.20	0.53
Total funding	$ 419,098 ($356,480)	$ 590,837 ($471,786)	$ 306,581 ($192,602)	334,571	0.73	0.043
Average funding per family	$ 714 ($843)	$ 763 ($727)	$ 683 ($923)	844.3	0.02	0.84
Output						
Number of families	949 (1,372)	1,410.2 (2,057.3)	641.1 (509.7)	1,283.5	0.6	0.126
Low income	6.0% (24.0%)	0% (0%)	9.7% (30.0%)	0.15	0.6	0.08
Quality						
Visits per family	3.38 (2.76)	2.72 (2.22)	3.81 (3.02)	2.62	0.04	0.18
Employees	5.32 (4.02)	7.34 (5.63)	4.09 (1.79)	3.71	0.88	0.024
Highly trained employees	87.7% (89.3%)	67.1% (51.3%)	100.0% (100.0%)	78.11	0.42	0.14

Figure 1.

Output of Parent Link Centres as a function of grants and fundraising



CHAPTER 4. SOCIAL RETURN ON INVESTMENT FOR ALBERTA TRIPLE P PROGRAM

INTRODUCTION

Parent Link Centres have been exclusively using the Triple P program as their parenting education method of choice. While individual facilities are not barred from using other methods, Triple P must be offered at every centre which is a Parent Link. This behavioural intervention was developed with the goal of reducing "problem behaviour" in children, with increasing intensity of involvement, from tip sheets to workshops with parents to family intervention with a trained counsellor. There is evidence that it may be effective (Sanders, Markie-Dadds, & Turner, 2003). However, it is not well known what the possible long-term impact of the program is, or the implications for resource use.

Most studies of early childhood interventions measure effectiveness by calculating the reduction in behavioural problems. Behavioural disorders, such as conduct disorder, are one of the most common mental health issues in Canadian children (Waddell, 2002). In its most severe form, conduct disorder involves behaviors ranging from physical aggression, destructiveness, consistent lying, and rule-breaking, such as persistent truancy (American Psychiatric Association, 2013). Conduct problems are less severe and do not conform to the definition of conduct disorder but nonetheless have adverse effects. The prevalence estimates for conduct disorder in North America range from 2.1% in Canada (based on UK data) to 9.5% in the US (Waddell, Offord, Shepard, et al. 2002; Nock, Kazdin, Hiripi, et al. 2006). Without intervention, children with problem behaviours in childhood tend to have poor outcomes in the home, school, and the community (Loeber, Burkey, Lahey, et al. 2000).

There is evidence that conduct problems may start early and have early consequences. Psychiatric disorders and involvement in criminal activities later in life can be linked to behaviour problems as early as preschool (Caspi, Moffitt, Newman, et al., 1996; Tremblay, 1994; Tremblay, 2001). Very young children with behavioural problems are already heavy users of health care and human services, using about 10% more services compared to a group of children without behavioural problems (Raaijmakers, 2011).

Parenting programs are recognized as an effective therapy for behavioural problems in children (Rutter, 2008). Because of the reduction in problem behavior coming *from* the child, as well as more positive parenting practices, parenting programs can create less harsh family interactions and better outcomes (Rutter, 2008). Short term studies of parent training programs show an immediate reduction in problem behaviour and increased quality of life for both the parents and the child (Dretzke, 2005). There is some controversy about the long-term benefits of behavioural intervention across the population (Wilson, 2012). However, in a Canadian longitudinal study entering its second decade, there has been direct evidence of the long-term benefits of interventions for child behaviour problems (Piquero, et al. 2009).

The effectiveness of the Triple P program varies considerably between studies among the caregivers reporting the behaviour (mother vs. father vs. parents) (Table 10). The lowest estimate that we found was a population-wide study in which 2.7% of children in the group with conduct problems moved to a sub-clinical range of behaviour as reported by parents (Sanders, Ralph, Sofronoff, et al., 2008). The highest rate of effectiveness we found was a reduction of 55% in a group for children with conduct disorder reported by parents (Zubrick, Ward, Silburn, et al., 2005). Study of Bodenmann et al. (2008) showed about 26% move to normal range with mothers showing 3% unit higher estimates than fathers. (Table 10)

Because of the possible economic benefits of the reduction of conduct problems by reducing costs in healthcare and social services, several studies have analysed the economic outcomes of Triple P and other parenting programs. Bonin et al. observed a reduced cost of health and social services as conduct disorder cases diminished to “non-clinical” levels resulting from general parent training intervention (Bonin, 2011). A modeling study of Mihalopoulos (2007) extrapolated the benefits of a reduction of the incidence of conduct disorder due to Triple P. Using a threshold analysis, the Triple P program was shown to be cost effective if the intervention achieved a conduct problem behavior reduction of 7% or more.

Three long-term evaluations of group parenting programs have also included an economic evaluation. The Chicago Parent Child Centres study focused on at-risk youth and it was shown to be effective in improving outcomes over the long term through a parent training program that was integrated with other services. The program promoted parental involvement in an enriched preschool setting and was part of a decades-long assessment. The positive rate of return comparing the cost of the program to the benefits, measured by a reduction in the incidence of abuse and neglect and future criminal behaviour was 7.7 to 1 (Cunha et al., 2006). The Abecedarian Project and the Perry Preschool program were two other programs in which a group was followed for several decades. In both cases, an enriched preschool environment and home visits resulted in a rate of return of 4:1 and 9:1, respectively (Cunha et al., 2006; Karoly, 2001) (Table 11).

In Canada, there is little information on the value of early childhood interventions; the few studies available on the cost of children's mental health include reports by Escober Doran et al., 2011, Waddell et al. 2007, and Public Health Agency of Canada 2009. To our knowledge,

there have been no cost effectiveness studies on parent training programs as a behavioural mental health intervention in Canada.

Social Return on Investment (SROI)

With roots in public policy, social return on investment (SROI) is a method of evaluation that grew out of a need for organizations to be able to value and compare their work in a competitive nonprofit funding environment. While very similar if not identical to the economics-based cost benefit analysis (CBA), SROI is portrayed as the more user-friendly alternative (Nicholls, 2016). An advantage that has often been cited is that SROI can provide a broader social context for an organization's work, making it easier to compare with other services (Banke-Thomas, 2015). Cost-benefit analysis is sometimes criticized as demanding academic rigor to the point of the being impractical for organizations to use (Cordes, 2016). However, SROI and cost benefit analysis are often used interchangeably in the literature, and in fact, there is little practical difference between the two evaluation methods as demonstrated in Table 12.

Where the two methods diverge is that the primary focus of SROI is the organization itself or a major stakeholder – a specific person or group who are impacted by the intervention. As it is used in health economics, cost-benefit analysis is often used to decide between two treatments or interventions. The SROI, by contrast, is more often used to compare two organizations which may overlap between treatments, services, and populations served. SROI claims to have a greater focuson the stakeholder's perspective and calculates costs and benefits that are deemed essential by the stakeholder's mission (Yates & Marra, 2016). This single-minded focus on the organization can also be considered a weakness of SROI, as it aims to assess the societal impact of the organization while perhaps over-emphasizing the needs and impact of the organization itself (Banke-Thomas, 2015).

Both methods start with the same question – do program benefits exceed the costs? A similar cost-benefit ratio is calculated to answer this question, though there are some minor differences. Most of the differences can be explained by SROI's focus on the stakeholder as "client." The differences between SROI and cost benefit analysis are small and likely a result of marketing rather than practical differences. SROI is a trademarked worldwide organization that markets itself to large corporations and non-profits, with exclusive training and certifications, unlike CBA.

CBA calculates the cost benefit ratio based on societal preferences, which may take organizational goals into account, but not necessarily. Again, in SROI, the costs and benefits from the perspective of the organization take precedence. The ratio in CBA adopts a social utility perspective, whereas the ratio in SROI is based on outcomes of the organizational mission (Table 12).

In SROI, the emphasis is placed on the process of information gathering and "reflexive consultative processes," or a continual involvement of the organization during the process of evaluation (Banke-Thomas, 2015). CBA, in turn, does not necessarily emphasize the process as an important part of the evaluation. Also, CBA deals with costs or benefits that are related to resources that can be "monetized," i.e., having a monetary figure assigned to a cost or benefit. SROI, includes resources, transfer payments, and intangible benefits and uses the concept of "financial proxies," for items which would usually be excluded from the CBA analysis, though it is not disallowed in cost benefit analysis. The financial proxies are usually valued by subjective valuations. (Table 12)

Yates & Marra, 2016, described SROI as easier to analyze using only existing data such as financial statements, so we have chosen it to evaluate the Triple P program using the financial information from the Alberta Human Services year-end data. Using financial statements has the disadvantage of not being set up for economic evaluation. They do not consider measures that are not monetizable, as these are irrelevant to accounting statements, but are readily available. We assume that certain measures are not available on the financial statements and need to be augmented through other data.

Purpose

Our goal is to model the long-term consequences of conduct and behaviour problems in children by performing a SROI for the Triple P parenting program in Alberta. We address the following questions from the perspective of the government in an Albertan context:

- What is the economic burden of child conduct problems?
- What is the social return on investment for early intervention?

We will compare the costs of children with and without conduct problems, using a literature search on parent training interventions and cost data from Alberta from the perspective of the government. We will then estimate the possible reduction in costs because of the universal intervention. We use Alberta to model the long-term impact of a parenting education intervention. Alberta makes a good case study, as the Triple P program is distributed universally throughout the province and is the exclusive parenting program in Parent Link Centres, by far the most prevalent family resource centres in the province.

By modeling the long-term costs and consequences, we hope to more clearly understand the resources needed to address conduct problems in children. Using existing longitudinal

studies comparing lifetime outcomes of children with and without conduct problems, we will determine the cost using local cost data. We measure the likely impact of introducing Triple P on reducing resource use and costs in education, social services, inpatient and outpatient health, and the justice system to the age of early adulthood.

METHODS

We chose to use social return on investment in our analysis because it has more practical use for the evaluated organization itself. One of the main benefits of SROI is the focus on the evaluation of the organization as opposed to therapies or medications, as CBA is often used in health economics. SROI can be conducted using limited data, and the financial information for Triple P in Parent Link Centres is already in place for us to conduct an SROI evaluation. Stakeholder involvement was heavily integrated as we developed the model over time including Alberta Human Services that has funded and is implementing the program with non-profit partnerships.

Consequences of conduct problems

We searched for longitudinal studies that identified children with behavioural and conduct problems and followed up with the same cohort in outcomes in childhood or adulthood in MEDLINE, PsycINFO, and CINAHL. Using the Ovid interface, we used the following search criteria: "Child Behaviour Disorders OR Conduct Disorder OR Social Behaviour Disorders," mapping the terms to subject headings and using keywords. We also included references from review articles, notably a study of the childhood determinants of mental illness (Fryers and Brugha, 2013). References within these articles were examined for missed articles, and these relevant references were included (Table 13). We also searched for specific longitudinal studies, which included the Dunedin child longitudinal study in New Zealand, the Avon longitudinal

study in the UK, and the Smoky Mountains study in the US (Moffitt, 2001; University of Bristol, 2018; Costello et al, 2005).

Longitudinal studies were included if:

1. They followed a single cohort of individuals, measuring behaviour before the age of 12,
2. They compared a group with conduct problems to those without,
3. Outcomes led to costs in the public sector, such as healthcare utilization, social services, education, and the justice system. Studies were not included if outcomes were difficult to value monetarily, such as "self-confidence."

Behavioural problems can be identified from different perspectives. The identification of a behavioural problem can vary in parental report versus teacher report versus a child or teen's self-report. Teacher reports are more correlated with a child's self-report of behaviour, but parental reports seem to differ from children's (Verhulst, Koot, and van der Ende, 1994).

The definition of conduct problems can also vary by study. Behavioural problems can be measured by cut-off points on behaviour scales, and the point at which conduct problems exist defined by each researcher. Methods of defining behaviour problems within the samples included measures such as the Strengths and Difficulties Questionnaire or, more commonly, the Child Behaviour Checklist (Goodman, 2001; Achenbach, 1994). Alternatively, a formal diagnosis of conduct disorder may be made by a qualified mental health professional. Because of the likely variation, we will perform a sensitivity analysis including a prevalence range for conduct problems and differences in frequency between the two groups, conduct problems and a normative sample.

It is also difficult to separate the consequences that can be attributed solely to differences in behaviour. Conduct problems are closely tied to factors within the family, such as parental mental illness or child maltreatment, social factors such as income inequality and poverty. Biological factors such as the child's personality also affect the development of conduct problems (Fryers and Brugha, 2013). The World Health Organization has indicated similar difficulties with their classification of conduct disorder, included for the first time in the 2010 Global Burden of Disease (Erskine, 2013). Regardless of this ambiguity, we will try to remain consistent and use the researchers' definitions for each of the studies (Table 14).

We use estimates of the North American rates of conduct disorder, the most severe form of conduct problems, and found a range of lifetime prevalence. A Canadian estimate gave a prevalence of conduct disorder at 2.1%, and a larger study from the US calculated a prevalence of 9.5% (Waddell, Offord, Shepard, et al. 2002; Nock, Kazdin, Hiripi, et al. 2006). Within a single study, the group of children with conduct problems was estimated at 14.8% (Raaijmakers, 2012). This study was performed in the Netherlands and, while the estimate is higher compared to the other studies, we are including it, as it is the only study to incorporate very small children (0-4).

We multiply the percentage of children experiencing this outcome by the individual cost of this outcome. If an outcome is mentioned once in the literature, we assume that it has only occurred one time. The sum of the costs of these outcomes for children with conduct disorder gave us the societal, lifetime cost of conduct disorder for this group.

Costs of conduct problems

Costs are determined using Canadian and Albertan data and other sources, brought to 2013 Canadian dollars. For hospital and outpatient charges, we source it from the Canadian Institute for Health Information or Alberta Health data. Using the longitudinal studies, we calculate the frequency difference between the two populations, or the percentage of outcomes in people with conduct problems in childhood were compared to those who did not have conduct problems (Table 15). The excess proportion of each outcome (conduct problem group – normative group) experienced by the population was assigned unit costs for each individual, based on information from Alberta. Again, we followed the original literature in terms of frequency of service use. If the study mentioned the cost event occurring yearly, the cost was included in the SROI yearly. If the study mentioned the cost occurring without any specified frequency, for example foster care, we assumed only one instance of it within the time of the study.

We used five categories of consequences that result in increased costs in health and human services for children with conduct problems. These include costs in the following sectors:

1. Education
2. Inpatient healthcare [1]
3. Outpatient and health support services[1]
4. Social services
5. Justice system

[1] Including mental health

Education

A major cost burden for children with psychiatric illness is in the education sector, including special education (Snell, 2013). The government of Alberta provides supplemental funding to schools for children with moderate and severe emotional problems. This funding continues to the end of high school. The annual supplement, over the base instruction funding, from Alberta Education to private schools was $12,528 for children with a severe emotional difficulty (Alberta Education, 2012; Alberta Education, 2016).

Inpatient Healthcare

Even in very early childhood, children with conduct problems have greater costs in both inpatient and outpatient health services (Raaijmakers, 2011), and these increased costs continue into adulthood (Fergusson, Horwood, & Ridder, 2005). The cost of a single inpatient day was $995.52 (Alberta Health, 2017). With the average length of stay for an acute care hospital at 8 days (for all patients, including adults), a single instance of an inpatient stay was $7,865, and a single instance of a psychiatric inpatient stay averaged $9,632.39 (Canadian Institute for Health Information, 2017) (Table 16). Again, we assumed that the individual only had one instance of an inpatient stay in an acute care hospital or psychiatric facility if it was mentioned once in the literature. Individuals who were identified with conduct problems as children are more likely to visit the emergency department (D'Amico, 2014). A single instance of an emergency room visit has a cost of $519.29 for a general emergency visit intervention (Alberta Health, 2017).

Outpatient healthcare

In early childhood, the following outpatient services are utilized more in children with conduct problems: speech therapy and health visitor, physiotherapist services, and outpatient care (Raaijmakers, 2011). We make a conservative estimate of a single hour of work in a single

instance from a physiotherapist ($43/hour), a speech therapist ($45/hour) and or a health visitor to the home ($42/hour) (Alberta Learning Information Service, 2017). In a study of older children, while both types of children were equally likely to visit a general practitioner, children with conduct problems were more likely to see a specialist physician (Lucas, Bayer, & Gold, 2013). We determined a single visit to a general practitioner as $150 and a specialist physician as $163 for a general assessment or therapy of a family (Alberta Medical Association, 2017). A psychiatric outpatient visit in Alberta has a cost of $153 for the psychiatric assessment of a family (Alberta Health, 2012) (Table 16).

Justice system

Adults who experienced conduct problems as children tend to engage in criminal activities to a greater extent than the general population. This results in increased costs in the form of policing, prosecutions, court services and prison or community sentencing (Scott, 2001). Individuals identified with conduct problems in childhood are more likely to be involved in both property crime and violent crime (Murray, Menezes, & Hickman, 2015). They are also more likely to be the perpetrator *or a victim* of interpersonal violence (Fergusson, Horwood, & Ridder, 2005). The average cost of a single adult being involved in correctional services in Alberta is $12,399.89, including policing and court costs (Statistics Canada, 2015a; Statistics Canada, 2015b). The additional cost to the victim in property or non-violent crime in addition to correctional services costs was estimated at $35,191, and the cost of a violent crime was estimated at $99,802 (Fraser Institute, 2014). Interpersonal violence, not including conviction and imprisonment, has an additional cost of $4,564.91 (Zhang, Hoddenbagh, & McDonald, 2012) (Table 16).

Social services

Children with conduct disorder are more likely to be in foster care (Scott, 2001). The possible reasons for this are not included in this paper, but in 2007, there were 4,790 children in foster care in Alberta, with an average annual cost of $23,407 to the provincial government (Alberta Children and Youth Services, 2008). We assume one year of foster care before the age of 18 years for children with conduct disorder, based on placement statistics from the United States (Child Welfare Information Gateway, 2011).

Cost calculation of conduct problems

We determined the cost of conduct problems by comparing the average cost of two individuals – one with conduct problems identified in childhood versus one without. The excess cost was the amount that we attributed to conduct problems. This matched control cost of illness method counts the excess cost of someone with the disorder over that of a person who does not suffer from the disorder regarding healthcare costs, mental health costs, and increased social costs (Akobundu, 2006). Two groups of researchers in the UK also used this matched control cost of illness for children with conduct problems, comparing the cost of social services used by children with conduct problems compared to those within the normal range of behaviour, attributing the difference as the cost of conduct problems (Friedli and Parsonage, 2007; Scott, 2001).

Using the studies obtained from the literature search, we calculated the difference between consequences or cost events. We defined cost events as events in an individual's life which result in a cost to the government. Examples may include an instance of a criminal conviction or hospitalization in a psychiatric facility. Within each study, we compare the frequencies of an event occurring in the control group with no conduct problems versus the highest conduct problem level measured in the study (Table 15).

Our method expands the analysis performed by Mihalopoulos (2007) by citing more studies connecting consequences, or cost events, to conduct disorder. We used studies that compared the frequency of cost events in children with conduct problems to those without.

To calculate the excess cost of conduct disorder for an individual, we use the following Equation 4.1:

$$IC_{cp-ncp} = \sum_i \left[\left(f_{cp} - f_{ncp}\right) \times (unit\ cost_i)\right](D) \qquad \text{(Equation 4.1)}$$

Where IC_{cp-ncp} = the excess average individual cost of conduct problems

i = cost events

f_{cp} = frequency of the event for individuals *with* conduct problems

f_{ncp} = frequency of the event for individuals with *no* conduct problems

D = the rate of discountingof 5% (CADTH, 2006)

Cost of Triple P

We estimated the cost of the implementation of the Triple P program in Alberta, including training, material, and labor costs. The resources needed at each phase of the Triple P intervention and their costs for one year fell into three categories:

- training and accreditation of the providers,
- material costs for providing Triple P, and
- labor costs for the group.

Start up costs are obtained for one group of providers. Numbers of providers and their time were based on Triple P standards. Data were obtained from the Canadian Triple P coordinator in 2011, applied to Alberta, and brought to 2013 dollars. We did not include costs

for the Triple P trainers, including catering, travel, and space costs. We used data from Alberta Human Services on the number of materials handed out and the hours used to provide Triple P sessions to the families, in individual or group formats. Labor costs are assumed to delivered by a trained facilitator receiving an hourly rate of $23, approximately the same as the Alberta average for child mental health workers (Alberta Learning Information Service, 2017).

The social return on investment model

The social return on investment for the Triple P program is calculated as the ratio between:

1. The program benefit, measured as reduction in youth and adult consequences of conduct problems as a result of the program, and
2. the cost of operating the Triple P program.

The program benefit is calculated as follows. There is a reduction in the societal costs of crime, education, child services, and mental health services as a result of the intervention. A certain percentage of the participants of the program will move from a behavioral level indicating conduct problems to subclinical or normal behavioral levels. Those achieving normal behavioral levels experience normal outcomes, reducing costs to society. The societal cost savings as a result of the Triple P program is measured as the program benefit. All future benefits are discounted at a rate of 5%, in accordance with CADTH economic evaluation guidelines (Canadian Agency for Drugs and Technologies in Health, 2006).

The model is presented by the Equation 4.2:

$$SROI = \frac{(IC_{cp-ncp})(R_{program})(N_{cp})(U_{cp})}{C_{program}} \quad \text{Equation 4.2.}$$

Where: IC_{cp-ncp} = the excess cost of conduct problems for one individual over the cost of services to an average individual with no conduct problems

$R_{program}$ = the potential reduction of conduct problems attributed to the intervention program

N_{cp} = the number of children (0-5) with conduct problems treated by the program

U_{cp} = the utilization rate for the intervention program

C_p = the cost to operate the intervention program.

The numerator of the SROI represents the benefit of the Triple P program. We will multiply IC_{cp-ncp}, the individual, excess cost of conduct problems, by N_{cp}, the number of children receiving Triple P within the Alberta Parent Link Centres estimated to have conduct problems. This is modified by multiplying $R_{program}$, the reduction of conduct problems attributable to Triple P, by U_{cp} , the rate of utilization. A community study of the Triple P program gave a participation rate of 100%, given direct, focused recruitment and follow up with the target parents (Zubrick et al., 2003).

The denominator of the SROI is C_p, the cost of the Triple P program within the Parent Link Centres (Equation 4.2).

Sensitivity Analysis

Sensitivity analyses can increase the confidence of study results, given possible uncertainty in parameters of the analysis. In our study, we use one-way sensitivity analysis to estimate the range of possible SROI ratios as a function of the variations in:

1. Estimates of the reduction of conduct problems (2.7% to 55%).
2. Prevalence estimates of conduct disorder (2.1% to 15%),
3. Utilization estimates for the intervention program (Triple P) (66% to 100%), and
4. Differences between the frequency of events between individuals with conduct problems and those without (high % for CP-low % for non CP vs low % for CP-high % for non CP).

In the sensitivity analysis, we will report the range of SROI ratios given those variations.

RESULTS

Our first goal was to determine the economic burden of conduct problems using the literature and cost data in Alberta and Canada. Secondly, we calculate a return on investment on a parenting intervention in Alberta.

Costs of Conduct Problems

We modeled the lifetime costs of conduct problems in Alberta using existing literature on behaviour problems and its related outcomes, from the perspective of the government. The costs of conduct problems were modeled by calculating the lifetime cost of an individual with conduct problems minus the cost of an individual *without* conduct problems using Equation 4.1. As model inputs, we used nine studies to identify long-term outcomes based on conduct problems in childhood (Table 14).

Using the literature available comparing the lifetime, monetizable outcomes of children with conduct problems and those without, the excess cost of conduct problems for an individual was $36,549, or $10,762, using a discount rate of 5%.

To calculate the total cost of children experiencing conduct problems we used the number of children in Parent Link Centres in 2012 (n=36,549) and assumed 9.5% of this group experience conduct problems (Nock, Kazdin, Hiripi, et al. 2006). Assuming that 3,472 children have conduct problems, we calculated that the total lifetime burden of conduct problems for this one-year cohort of children in Alberta to be$37.4 million.

Cost of Triple P program

We estimated the total cost of the Triple P program ($C_{program}$) as $1.62 million, using data provided by the Triple P program in Alberta. The majority of this was comprised of initial training costs, or $996,953. Staff costs to implement the program at all levels was $143,635. Costs for the materials were estimated at $499,201.

Social Return on Investment

We used Equation 4.2 to calculate the Social Return on Investment (SROI). Our SROI models the treatment of children between age 0-5 attending Parent Link Centres in 2013, as found in Chapter 1 (n=36,549). Using a 9.5% prevalence for conduct disorder, the benefits outweigh the costs at less than a 5% reduction of conduct problems. To estimate the reduction in conduct problems as a result of the intervention, we chose three Triple P estimates which were assessed 1-2 years post-intervention. These effectiveness scores averaged a 29.8% reduction in conduct problems to normal or subclinical levels.

Using these figures, we calculate an SROI ratio of 6.87.

Sensitivity Analysis

The sensitivity analysis shows that our positive SROI is fairly robust given realistic variations. Holding every other parameter constant, we look at the following variations:

1. Estimates of the reduction of conduct problems (2.7% to 55%).

Lowering the effectiveness to 2.7% reduces the SROI to 0.62:1, meaning a negative return to the program. An increase in effectiveness to only 5%, results in a positive return.

2. Prevalence estimates of conduct disorder (2.1% to 15%).

Lowering the prevalence of conduct disorder to 2.1% still results in a positive SROI of 1.5:1.

3. Utilization estimates for the intervention program (Triple P) (66% to 100%).

Reducing the utilization rate of the Triple P program to 66% results in a positive SROI of 4.6:1.

4. Differences between the frequency of events between individuals with conduct problems and those without them; (high % for CP-low % for non CP vs low % for CP-high % for non CP).

For our estimate, we used the lowest percent difference between the conduct problem group and the normative group (low % for CP-high% for non CP). For example, if there is a range of outcomes for the no CP group from 1-5% and a range of outcomes for the CP group from 10-15%, the large difference would be (15%-1% = 14%) and a small difference would be (10%-5%=5%). Using the high frequency difference (high % for CP-low % for non CP) increases the SROI to 8:1.

DISCUSSION

We reviewed the economic evidence for the Triple P program, an early childhood intervention in Alberta, performing a literature review of the long-term costs of conduct problems in adulthood and the effectiveness of the program in reducing this behaviour. Using these results and costs supplied by the Triple P program in Alberta, we developed an economic

model to determine the return on investment and found a social return on investment of 6.87:1. In other words, with an investment of $1 per child by Alberta for a child who is likely to develop conduct problems, the long-term return on this investment is about $7.

Our estimate of the social return on investment ratio of 6.87:1 is within the range of previous literature on the long-term benefits of early childhood interventions. Using much larger study sample, long-term studies of the Chicago Parent Child Centre showed an SROI ratio of approximately 7:1 (Cunha, Heckman, & Lochner, 2006; Reynolds, Temple, & Ou, 2003).

This consistency demonstrates the robustness of this type of analysis in a Canadian context. Canadian studies on childhood mental health promotion are scarce, and economic evaluations are rarer still (Waddell, Hua, Garland, et al., 2007). In our study, we were able to generalize these results using Canadian cost data to an existing program in Alberta, putting the Triple P early childhood intervention in a Canadian context. In our one-way sensitivity analysis, looking at ranges of the effectiveness of Triple P, the range of prevalence estimates for conduct disorder, and the range of estimates for outcomes, only one estimate (effectiveness) resulted in a negative SROI. After passing a threshold of 5%, however, the SROI became positive. In the literature on Triple P, an effectiveness of higher than 5% is likely.

This study has some limitations. Our estimated discounted cost of conduct problems was $10,762 per lifetime, which was much lower than other estimates. Cunha, 2006, made an estimate of $30,000 per child. We have made a conservative estimate, confining our analysis to a small number of benefits which had direct, quantifiable ties to conduct disorder and to those for which we were able to obtain financial data from provincial or Canadian sources such as Alberta Health or Employment, etc. Outcomes that were difficult to quantify in terms of monetary

benefit, or where a monetary estimate did not exist - increase in well-being, for example - were not included. As in other public health interventions, benefits from Triple P affect more than conduct disorder. Conduct disorder tends to occur with other mental health disorders, which the intervention is also likely to improve. These benefits may also trickle down to others, such as parents and siblings, not to mention those benefiting from the reduction of crime. Also, most of the costs of conduct problems are borne by families, which was not reflected in our costing method (Romeo, 2006). However, because we limited our data to Canadian data whenever possible, we believe this makes our results more applicable in a Canadian context.

A single behavioural intervention can not fully explain outcomes in children. Reynold's model, based on long-term longitudinal studies, describes three processes that must be sustained throughout childhood to maintain any positive effects- (1) cognitive advantage, (2) family support, and (3) school quality and support (Reynolds, Ou, Mondi, et al., 2017). Of these three, cognitive advantage and increasing family support occur through the Triple P program in Parent Link Centres. It would be beneficial for future analyses to include financial and service data from other provinces to expand this analysis nationwide.

An example of an ideal program would be an outcomes-based, integrated pathway for pregnant women that would support the child at least through elementary school. Based on our current knowledge of social determinants of health, income support and food security for the family would be addressed, as well as parent education to reduce harmful events such as physical punishment, as well as promote the child's emotional and social development. School readiness in numeracy and literacy would be addressed through an enhanced preschool to bring disadvantaged children on par with their more affluent peers. The Child Parent Centre in Chicago came close to this ideal, but, as expected, was very expensive to execute.

Long term evaluations on the effects of the Triple P program itself are decades away from evidence on the scale of the Child Parent Centres. By using a Social Return on Investment model for the Triple P program, we were able to explore the program's possible reach through health, education, and the justice system throughout Alberta. Demonstrating the effectiveness of parent support programs through modelling or longitudinal studies can only work if there is political and social support. Based on this study in an Albertan context, as well as the ongoing commitment of the province, I believe that the Triple P parenting program can continue to have a positive effect for children throughout Alberta for years to come.

Table 10. Triple P program studies finding a percentage of children moved to subclinical range due to intervention

Author(s)	Study	Age of intervention	Method of Evaluation	% moved into subclinical range due to intervention	Report	Time of evaluation
Zubrick, Ward, Silburn, Lawrence, Williams, Blair, Robertson, Sanders	Prevention of Child Behavior Problems Through Universal Implementation of a Group Behavioral Family Intervention (2005)	3.66	ECBI	55.40% (with 100% participation)	Parent	2 years after initial evaluation
				36.50% (with 66% participation)		
Bodenmann, Cina, Ledermann, Sanders	The efficacy of the Triple P positive parenting program in improving parenting and child behavior: A comparison with two other treatment conditions (2008)	6.60	ECBI	26%	Mother	immediate post intervention
			ECBI	26%	Father	immediate post intervention
			ECBI	28%	Mother	one year after evaluation
			ECBI	25%	Father	one year after evaluation
Schmid	Effectiveness of Triple P Services at the Children's Centre Thunder Bay: Final Report for Years 2007 to 2011 (2012)	6.83	SDQ	19%	Mother	immediate post intervention
			SDQ	4%	Father	
Sanders, Ralph, Sofronoff, Gardner, Thompson, Dwyer, Bidwell	Every Family: A Population Approach to Reducing Behavioral and Emotional Problems in Children Making the Transition to School (2008)	5.43	SDQ	2.7%	Parent	immediate post intervention

Note. ECBI = Eyberg Child Behavior Inventory; SDQ = Strengths and Difficulties Questionnaire

Table 11. Group parent training rates of return

Program	Age at start of assessment	Age at outcomes assessment	Location of data collection	Target Population	Mental health outcomes measured	Cost	Benefit	Rate of return	References
Perry Preschool Program	3-5 years old	Age 40	Ypsilanti, MI, USA	Children selected randomly: Daily enriched classroom sessions, and weekly home visits.	Crime, teenage pregnancy, abuse/neglect	$9785 (2004) per child/year	$50,000 per child	9.11:1	(Cunha, 2006); (Karoly, 2001)
Abecedarian project	~ 4 months old	Age 21	Chapel Hill, NC, USA	High-Risk Index families: Daily enriched preschool sessions. Home-visiting teacher supervising curriculum for each child & assisting with family issues.	Crime, smoking	$13,000 (2002) per child	$48,000	3.69:1	(Cunha, 2006) (Masse, 2002)
Chicago Child-Parent Center (CPC)	3-5 years old	Age 20	Chicago, IL, USA	Children selected by family socioeconomic status: school based, provided health/social services, promoted parental involvement.	Abuse/neglect, crime	$10,000 per participant	$35,000 per participant	7.77:1	(Cunha, 2006)

Table 12. Cost benefit analysis compared to social return on investment

Cost Benefit Analysis	Social Return on Investment
Social welfare	Social value
Focus on comparison of treatments	Focus on comparison of organizations
Stakeholder involvement not necessary	Stakeholder heavily involved
Process not necessarily reported as part of analysis	Process considered an essential part of resource gathering
Discounting is considered essential	Discounting not necessary, depends on time horizon of analysis
Analysis more "academically rigorous"	Can be calculated using easily available data (financial statements)
Cost benefit ratio	Cost benefit ratio
Social cost benefit ratio	Mission-related cost benefit ratio
Societal preferences and utility included	Outcomes of the organizational mission
No specified goal or audience	Audience and consumer is stakeholder

Table 13. Terms and specific longitudinal studies used for literature search

Search terms	Longitudinal Studies
conduct disorder*	"Christchurch Health and Development Study"
"conduct problem*"	Dunedin Multidisciplinary Health and Development Study
disruptive behaviour disorder	Growing up in New Zealand
disruptive behaviour disorder	Life Chances Longitudinal study
	MUSP OR Mater Misericordiae Mothers' Hospital-University of Queensland Study of Pregnancy
Child Behaviour Checklist	Raine Study
DSM Conduct Disorder	ABIS "All Babies in Southeast Sweden"
Strengths and Difficulties Questionnaire	ELSPAC or "European Longitudinal Study of Pregnancy and Childhood"
	NCDS or "National Child Development Study"
longitudinal studies	CILS or "children of immigrants longitudinal study"
	Minnesota Longitudinal Study of Risk and Adaptation
	National Children's Study
	"Mannheim Study of Children at risk"
	National Longitudinal Survey of Youth
	Australian Temperament project
	Panel Study of Income Dynamics, Child Development Supplement
	Simmons Longitudinal Study
	Longitudinal Studies of Child Abuse and Neglect
	Avon Longitudinal Study of Parents and Children
	"Family Development in the Course of Life"

Table 14. Lifetime consequences of conduct problems in longitudinal studies

Author(s)	Study	Country	Conduct Disorder Defined	N	Age at behavior assessment	Age/ time at outcome assessment	Outcomes
Scott, Knapp, Henderson, et al.	Financial Cost of Social Exclusion: follow up study of antisocial children into adulthood (2001)	UK	Behavioral problems - emotional problems excluded	142	10 years	Follow up interview at age 28	Remedial assistance, Hospital inpatient, psychiatric outpatient, child care/ foster care, youth incarceration
Fergusson, Horwood & Ridder	Show me the child at seven: the consequences of conduct problems in childhood for psychosocial functioning in adulthood (2005)	New Zealand	Parental/teacher reports of disruptive behaviors ("most disturbed" 5%) - Rutter & Connors parent and teacher questionnaires	1265	7-9 years	25 years of age	Hospital inpatient, Nonviolent crime, violent crime, interpersonal violence, unemployed/ welfare dependent, illicit drug dependence, major depressive disorder, anxiety, antisocial disorder, suicide attempt
Raaijmakers, Posthumus, Hout, et al.	Cross-sectional study into the costs and impact on family functioning of 4-year-old children with aggressive behavior (2011)	Netherlands	Child behavior checklist (Achenbach & Rescorla 2000) - Clinical (97th percentile)	317	4 years	over last 3 months (age 0-4)	Physiotherapist, speech therapist, health visitor, general practitioner, specialist services, psychologist, extra child care, social work
Verhulst, Koot, & van der Ende	Differential Predictive Value of Parents and Teachers Reports of Children's Problem Behaviors: A longitudinal study (1994)	Netherlands	Child behavior checklist/ Teacher's Report Form - 95.5th percentile	946	4-11 years	6 years after behavior assessment	Special needs support, psychiatric outpatient
Jones, Dodge, Foster, et al.	Early identification of children at risk for costly mental health service use (2002)	US	10th percentile. High risk: Child Behavior Checklist, Revised Problem Behavior Checklist, Teacher observation	391	5	12	Special needs support, remedial assistance, general practitioner, psychiatric outpatient, medication for mental health condition
Lucas, Bayer, Gold, et al.	The cost of healthcare for children with mental health difficulties (2013)	Australia	90th percentile for Strength and Difficulties Questionnaire ("mental health difficulty")	3605/ 4006; 2 cohorts	4-5,6-7,8-9	8	General practitioner, specialist, psychiatric outpatient
Murray, Menezes, Hickman, et al.	Childhood behaviour problems predict crime and violence in late adolescence: Brazilian and British cohort studies (2015)	Brazil/ UK	"Abnormal" levels of conduct problems, rated using Strength and Difficulties Questionnaire	F:1801, M:1683	11	18	Crime
Babinski, Hartsough, & Lambert	Childhood conduct problems, hyperactivity-impulsivity, and inattention as predictors of adult criminal activity (1999)	USA	Children's attention and adjustment survey	305	9	26	Crime
D'Amico, Knapp, Beecham, et al.	Use of services and associated costs for young adults with childhood hyperactivity/ conduct problems: 20-year follow-up (2014)	UK	Parent/ teacher Rutter scores	83	6-7 years	26-27 years	Hospital inpatient, emergency room, psychiatric inpatient, general practitioner, hospital outpatient, Unemployed/ welfare dependent

Table 15. Frequency differences in outcomes between individuals identified with conduct disorder vs normative group

	Outcome	Frequency Conduct Disorder	Frequency no Conduct Disorder	Difference	Source
Early childhood (0-4)	Physiotherapist, speech therapist, health visitor	95.70%	87.80%	7.90%	(Raaijmakers, 2011)
	General Practitioner	95.70%	87.80%	7.90%	
	Specialist Services/ pediatrician	95.70%	87.80%	7.90%	
	Psychologist	19.60%	8.50%	11.10%	
	Extra Child Care	28.30%	0.50%	27.80%	
	Social work	4.30%	0.50%	3.80%	
Middle childhood (5-9)	General practitioner	100.00%	99.50%	0.5% (Wave 1)	(Lucas, Bayer, Gold, 2013)
		64.00%	34.80%	29.2% (Wave 2)	
	Psychiatric outpatient	2.50%	0.50%	2.0% (Wave 1)	
Late childhood/ Adolescence (9-17)	Special needs support	56.30%	33.20%	23.10%	(Jones, Dodge, Foster, 2002)
		5.00%	1.00%	4.00%	(Verhulst, Koot, and van der Ende, 1994)
	Remedial assistance	6%	6%	0.00%	(Scott, 2001)
		32%	23%	9.20%	(Jones, Dodge, Foster, 2002)
	Hospital inpatient	44%	12%	32.00%	(Scott, 2001)
	Psychiatric inpatient	8%	0.80%	6.80%	(Jones, Dodge, Foster, 2002)
	General practitioner	18.10%	4.50%	13.60%	(Jones, Dodge, Foster, 2002)
	Psychiatric outpatient	19%	0%	19.00%	(Scott, 2001)
		46.50%	13%	33.50%	(Jones, Dodge, Foster, 2002)
		3.00%	1.00%	2.00%	(Verhulst, Koot, and van der Ende, 1994)
	Nonviolent crime	5.20%	1.60%	3.6% (Female)	(Murray, 2015)
		13.30%	8.20%	5.1% (Male)	(Murray, 2015)
	Violent crime	14.30%	6.60%	7.7% (Female)	(Murray, 2015)
		28.40%	20.70%	7.7% (Male)	(Murray, 2015)
	Foster care	0	3%	-3.00%	(Scott, 2001)

Adulthood (18+)	Hospital inpatient	39%	20%	19.00%	(D'Amico, 2014)
		18%	6.20%	12.20%	(Fergusson, 2005)
	Emergency room	67%	48%	19.00%	(D'Amico, 2014)
	Psychiatric inpatient	0%	9%	-9.00%	(Scott, 2001)
		0%	4%	-4.00%	(D'Amico, 2014)
	General practitioner	39%	60%	-21.00%	(D'Amico, 2014)
	Hospital outpatient	61%	73%	-12.00%	(D'Amico, 2014)
	Psychiatric outpatient	19%	0	19.00%	(Scott, 2001)
		56%	60%	-4.00%	(D'Amico, 2014)
	Criminal conviction	24%	13%	11.00%	(Kretschmer, 2014)
		14%	5%	8.40%	(Kratzer, 1997)
		65%	47%	18.00%	(Babinski, 1999)
	Nonviolent crime	17.40%	9.20%	8.20%	(Fergusson, 2005)
		34.80%	6.30%	28.50%	(Fergusson, 2005)
	Violent crime	19.60%	4.80%	14.80%	(Fergusson, 2005)
		23.90%	12.30%	11.60%	(Fergusson, 2005)
		27%	22%	5.00%	(D'Amico, 2014)
		32.60%	8.50%	24.10%	(Fergusson, 2005)

Table 16. AB/ Canadian costs corresponding to consequences for children with conduct problems

Cost item	Cost item source	Cost (CAD 2013)	Cost Source
General Practitioner	(Raiijmakers, 2012)	$ 150.41	Alberta Medical Association Fee Navigator
Specialist services	(Raiijmakers, 2012)	$ 170.00	Alberta Medical Association Fee Navigator
Hospital outpatient	(Raiijmakers, 2012)	$ 308.87	Alberta Interactive Health Data, 2013
Physiotherapist	(Raiijmakers, 2012)	$ 40.00	WAGEinfo: Alberta Wage and Salary Survey
Speech therapist	(Raiijmakers, 2012)	$ 45.00	WAGEinfo: Alberta Wage and Salary Survey
Health visitor	(Raiijmakers, 2012)	$ 40.20	WAGEinfo: Alberta Wage and Salary Survey
Psychologist	(Raiijmakers, 2012)	$ 182.23	Psychologists' Association of Alberta, Recommended Fee Schedule
Psychiatrist	(Raiijmakers, 2012)	$ 159.96	Government of Alberta, Health and Wellness, Alberta Health Care Insurance Plan - Schedule of Medical Benefits Part B
Outpatient psychiatric treatment	(Raiijmakers, 2012)	$ 153.88	Government of Alberta, Health and Wellness, Alberta Health Care Insurance Plan - Schedule of Medical Benefits Part B
Hospital inpatient (per day)	(Scott, 2001)	$ 995.52	Alberta Interactive Health Data, 2010
Special needs funding (severe - very stringent set of standards)	Jones 2002	$ 16,465.00	Alberta Education Special Education Funding Manual
Retaining grade	Jones 2002	$ 3,306.11	Measuring social investment/return on community schools
Remedial Assistance	Jones 2002	$ 62.00	Measuring social investment/return on community schools
Regional child care	(Raiijmakers, 2012)	$ 552.76	Government of Alberta, Human Services, Children and Youth
Social work	(Raiijmakers, 2012)	$ 37.32	WAGEinfo: Alberta Wage and Salary Survey

Medical day nursery	(Raiijmakers, 2012)	$	292.39	Calgary SROI
Foster care	(Scott, 2001)	$	23,407.06	Alberta Human Services
Juvenile justice	Jones 2002	$	1,268.47	Expenditure Analysis of Criminal Justice in Canada; StatsCan, Admissions of youth to custody and community supervision, by province and territory, 2010/2011
Convicted of a crime	(Scott, 2001) (Fergusson, 2005)	$	16,138.00	Jacobs, 2013
Crime: imprisoned	(Fergusson, 2005) (Scott, 2001)	$	12,399.89	Stats Can: Expenditures on adult correctional services, by jurisdiction, 2010/2011; Average counts of adults in correctional services, by jurisdiction, 2010/2011; Median days spent in custody
IP Violence (perp. or victim)	(Fergusson, 2005) (Scott, 2001)	$	4,564.91	An Estimation of the Economic Impact of Spousal Violence in Canada, Zhang, 2009

CONCLUSION

Health economics, more often used to evaluate health delivery, can analyze a complex intervention. In our case, we looked at a program for early childhood mental health promotion, Parent Link Centres in Alberta. We considered it a complex intervention as it connected education, health, and human services with possible outcomes ranging over many years and sectors of society. Using economic evaluation and modeling, our analysis resulted in valuable recommendations despite having relatively limited data.

We established a baseline for economic analysis, defining the ouptut and productivity of family resource centres in Alberta, performed a cost function analysis, compared the economic behaviour of non-profit and government Parent Link Centres, and carried out a social return on investment for their Triple P parenting program.

In the first paper, we found a wide range of of resource use and output across nearly every operational aspect of the Parent Link Centres. This was surprising, given that Parent Link Centres are under the same organizational umbrella in the province, and receive nearly the same government grant.

In the second paper, we conducted a cost function analysis of the Parent Link Centres. Using full time equivalent staff as a proxy for organizational cost, we found that the average cost to operate an urban centre was only a third of that for a centre in a rural location. We also found that having more highly trained employees (staff trained in Level 4 Triple P) lowered average cost. After being unable to explain these findings adequately using the cost function technique, we looked closer at organization type – non-profit versus government – in our next paper.

In the third paper, we examined the common partnership between non-profit and government organizations. We found that non-profits provide services to a different set of clients while remaining on a stronger financial footing. It was especially interesting that Parent Link Centres, which are generally grassroots centres established by members of the community, follow the same economic patterns of larger non-profit entities. It emphasized the need for governments to maintain a partnership with financially stronger non-profits while retaining their own centres to fill in remaining service gaps.

In the final paper, we performed a social return on investment for the Triple P program in Alberta, finding a rate of return for the program in the province. We found that the possible benefits outweighed the costs, demonstrating that interventions in one field have implications throughout society, and using a model to illustrate these consequences into the future.

Future Directions

The Economics of Volunteer Productivity

As demonstrated in Chapters 1 and 2, the number of volunteers did not increase productivity or lower the average cost of the Parent Link Centres. Considering that organizations in health and human services spend a vast amount of resources on recruitment, retention, and supervision of volunteers, it would be worthwhile to look closer using an economic lens. Some questions we would like to examine further are: How important are volunteers in terms of service delivery and resource use? What are the actual costs of recruitment and retention and supervising a cadre of volunteers, and how does it compare to maintaining paid staff?

To our knowledge, the literature on the economics of volunteer productivity is relatively scarce. Economic research in volunteerism tends to focus on what the organization contributes to the economy or economic reasons people choose to volunteer, rather than volunteers as part of economic production. This may be due to difficulty in defining value and output in human service production (Roy & Ziemek, 2000). The productivity relationship between volunteers and paid workers is complex and not entirely a direct substitution for one for the other.

The importance of definitions- for value, output, impact, etc.- may touch on the fourth chapter in which the social impact of an organization is measured. The value of an organization can be more accurately assessed when looking at its social impact, going beyond traditional, direct measures of output. Perhaps our measure of productivity, the number of families served by the Parent Link Centres, did not capture the true impact of volunteers in the organization. It would be worth expanding into the economic impact of volunteer productivity, given its importance.

Family resource centres: integration of services

To our knowledge, our analysis is the only economic study of family resource centres whose contribution as a hub for vulnerable families tends to be undervalued. However, there are still many questions to be answered. Except for the Triple P parenting program, which has been heavily studied for many years, there is little information on how family resource centres affect families.

We found that Parent Link Centres, as part of a more extensive network of early childhood and parenting supports, can have a positive effect on children and families in

Alberta. The cause of their beneficial effects has yet to be explored thoroughly. One possible mechanism could be simply connecting vulnerable families to support services, as much of the problem of intervention is how to reach families who need it.

Because the Parent Link Centres are universally and publicly available, it increases the chances of families connecting with the services they may need. The disruptive nature of conduct problems, belligerence, fighting, destructive behaviour, etc., may make it more likely for families to seek help (Ryan, Jorm, Toumbourou, & Lubman, 2015). In this case, the "squeaky wheel," or disruptive child, may get the help they need, especially since conduct problems are often co-morbid with other disorders, often attention deficit and hyperactivity disorder (Babinski, Hartsough, & Lambert, 1999). In other words, parents who perceive a problem or a need are more likely to seek help (Siobhan, 2015). In other cases, however, children who need help are *less* likely to receive it. Children who need specialized mental health services often do not receive the care they need (Sawyer, Arney, & Baghurst, 2001). An Alberta study showed that mental health services for children are often fragmented and disorganized (McLellan, 2010).

The community itself and connection to other resources may be a positive mechanism of the centres. A Canadian study of at-risk children showed a direct connection between seemingly unrelated services. Taking into account other factors, families who participated in a recreation program were less likely to enroll in unemployment benefits (Browne et al., 1999). In a global study, simply reading and playing together in family resource centres benefitted very young children in a resource-poor country (Maulik & Darmstadt, 2009). Another family resource program in the UK, Sure Start, is aimed at economically disadvantaged communities. Their success is attributed to better access to health services

and integration of support services (Belsky, Melhuish, & Barnes, et al., 2006). A primary role of Parent Link Centres is actively referring families to other agencies. Social isolation, behavioural problems in their small children, or support for themselves were some of the reasons that parents mentioned as initially drawing them to Parent Link Centres (Parent Link Centre reports, unpublished).

Early childhood interventions, no matter how beneficial, can only have a long-term impact if support continues consistently throughout childhood and early adulthood. A balance must be achieved between strengthening parenting skills within the family and increasing health, social services, and other supports. The longest running longitudinal study of family support – the Chicago Parent Link Centre and the Perry Preschool program – found that long lasting benefits were achieved first by supporting the family itself through home visits, an enriched preschool program, and with continued support (Reynolds, 2010). The economic benefits of early childhood intervention can only be achieved with a lifetime commitment to the individual child, their family, and their environment.

Health Economics for Human Services

Health economics was designed to capture well-being measures that before were difficult to measure. It naturally follows to extend the techniques to human services. For example, quality adjusted life years (QALYs), a composite measure of quality of life and actual years of life was used to determine that mental health problems create the greatest disease burden in the world (Drummond, Weatherly, & Ferguson, 2008; World Health Organization, 2008). It makes sense to continue to expand analysis of mental health services into community settings.

In earlier work with the Institute of Health Economics, it was shown that that mental health care delivery is shared by organizations ranging from government health care to smaller community mental healthcare services (Jacobs, Dewa, Lesage, et al., 2010). Health economic analysis is not just a way to evaluate health interventions but answers questions by placing seemingly disparate fields, organizations, and treatments, within the same framework.

There is a perception that economic analysis is only useful in a large-scale cost analysis. In our analysis, however, we were able to obtain results that were similar to a study performed in Alberta on a much larger scale (Early Child Development Mapping Project, 2015). Both the ECD Mapping project and our project found that there were fewer early childhood resources (or Parent Link Centres) in poor neighborhoods and rural areas. Due in part to our economic analysis, not only were we able to obtain results that were similar to a much more extensive project that involved a year-long survey of children and teachers, but we also identified characteristics of the Parent Link Centres that provided the explanation for this phenomenon.

The ECD Mapping project found that neighborhoods with higher socioeconomic status had more early child development resources. In our smaller study, we also found in Chapter 3 that very poor neighborhoods had fewer and smaller Parent Link Centres. Another finding of the ECD Mapping project was that there were more child and family resources in areas of greater population density, a fact which we captured in Chapter 3.

We were also able to expand understanding of early childhood services beyond the ECD Mapping report. The report asserted, for example, that it was "understandable" that

resources would concentrate in urban areas. Our study explained that, because there was a natural tendency for nonprofit organizations to move towards more urban areas, government-operated Parent Link Centres were able to fill in those service gaps. Directly targeting funding to government centres is a relatively straightforward solution to the problem of unequal distribution of child and family resources identified by their much larger study. In short, we were able to demonstrate that economic analysis is ideal either in place of or in preparation for a larger-scale evaluation in human services.

Some barriers to integrating economic analysis into policy decision making may include the perception that the analysis is too costly itself, in terms of resources and staff, or that it is excessively complex. Another reason pointed out by Sefton (2002) is simply a *lack of demand* from policy-makers, who may believe that it has no practical use for community services.

However, in a presentation I made to community leaders in Edmonton, there was much interest in using economic analysis even in smaller organizations. Much of their enthusiasm stemmed from three basic goals: to communicate the "value" of their work, to clearly identify who their stakeholders were, and to demonstrate what exactly their work was producing.

I would argue that human services, especially community-based programs, find themselves in a similar situation to healthcare several decades ago. Both clearly provide valuable services, but with relatively little information on resource inputs or production. An unambiguous message of this thesis is that health economics, with its systematic evaluation

methods, is the ideal tool to properly evaluate and plan for complex interventions integrating health, social, and human services.

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