

*Evaluation of the  
Canada Pension Plan Disability  
Vocational Rehabilitation Program*

**Final Report**

*Audit and Evaluation Directorate  
Strategic Direction  
Social Development Canada*

*September 2004*

**SP-AH209-09-04E  
(également disponible en français)**

**Paper**

ISBN: 0-662-38731-7

Cat. No.: HS28-12/2004E

**PDF**

ISBN: 0-662-38732-5

Cat. No.: HS28-12/2004E-PDF

**HTML**

ISBN: 0-662-38733-3

Cat. No.: HS28-12/2004E-HTML

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# *List of Acronyms*

AED – Audit and Evaluation Directorate

CPP – Canada Pension Plan

CPPD VR – Canada Pension Plan Disability Vocational Rehabilitation

EI – Employment Insurance

ISP – Income Security Programs

MBF – Master Benefit File

OLS – Ordinary Least Squares

QPP – Quebec Pension Plan

PSRA – Prescheduled Reassessment

RBRS – Rules Based Reassessment System

RCMS – Rehabilitation Case Management System

ROE – Record of Earnings

SDC – Social Development Canada

SGO – Substantially Gainful Occupation

U.S. GAO – United States General Accounting Office



# *Executive Summary*

## **Background**

The Canada Pension Plan Disability Vocational Rehabilitation (CPP Disability VR) program is designed to help people who receive a Canada Pension Plan Disability benefit return to work. It was established in 1997 as a successor program to the pilot program—National Vocational Rehabilitation—that operated over the 1992-1997 period. The two objectives of the CPP Disability VR program are:

- to provide reasonable, cost-effective vocational rehabilitation measures for CPP Disability beneficiaries to facilitate a return to any substantially gainful employment; and
- to achieve cost savings to the CPP by reducing the average duration of benefits of those CPP Disability beneficiaries who complete vocational rehabilitation and gain the capacity to return to work.

Vocational Rehabilitation is administered and managed by Regional Headquarters (RHQs) of Social Development Canada (SDC) in all regions with functional program direction provided by National Headquarters (NHQ) VR staff with the exception of Québec where the Government of Québec manages its own pension plan, the Québec Pension Plan (QPP). The CPP Disability VR program is delivered in the nine regions by about 30 case managers who screen CPP Disability beneficiaries as to their suitability for vocational rehabilitation and manage the vocational rehabilitation process. Individualized vocational rehabilitation plans are developed by case managers, in consultation with third party providers under contract to CPPD, and the client. Some of the services provided include vocational assessment, planning, skills development and job search assistance. Every year, approximately 200 CPP Disability clients take up CPP Disability VR services.

## **Evaluation Approach**

The evaluation was conducted in March 2003 with the objective of assessing how effectively the CPP Disability VR program met its objectives. It was agreed, in discussions between Audit and Evaluation Directorate<sup>1</sup> and Income Security Programs (ISP) that a subsequent Phase II would expand on the knowledge acquired on Phase I and include qualitative analysis such as focus groups and surveys of participant and comparison groups. However, in light of the new Return to Work initiative, undertaken by ISP, the decision was made to evaluate those issues in a future comprehensive evaluation of return to work services for CPP Disability clients.

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<sup>1</sup> Formerly: Evaluation and Data Development (EDD).

The evaluation describes the CPP Disability VR program and its participants and estimates the impact of participation on the probability of post-program employment and benefits cessation. For each program objective, estimates were calculated using different estimation techniques and several comparison groups with the goal of providing multiple lines of evidence in assessing program success. The analysis was based on Income Security Programs' (ISP) administrative data. Only participants who started their rehabilitation in 1998 were included in the reference group in order to allow for a significant number of years to elapse (four years) for outcomes to be measurable.

As is common with many evaluations of recently-implemented programs, the current evaluation was only able to observe a limited number of years of post-CPP Disability VR activities - in this case four years. This poses limitations for the extrapolation of program effects in the long run. It is recommended that future evaluation efforts make use of additional years of data to extend the current analysis in order to examine the sustainability of the various outcomes over a longer post-program time period. As well, by doing so, it would be possible to estimate the expected length of time clients stay off benefits after receiving CPP Disability VR using techniques such as hazard estimation methods (e.g. Hennessey and Muller, 1994).

It is important to note that there are possible social benefits from participating in CPP Disability VR, not identified in the current evaluation. These could include, among other benefits, higher self-esteem, greater independence, improved set of generic work/career development/job search skills, lower use of health services, and greater community integration. It is therefore recommended that future evaluation efforts survey recipients to obtain a better idea of what these social benefits are as well as identify factors that participants believe resulted in their successful/unsuccessful recovery and additional measures that may improve the program to better serve the needs of this clientele.

The identification of social benefits would also assist the completion of a thorough cost-benefit analysis. For this evaluation, the net re-employment rate among VR participants and gross cost savings to the CPP Account over a four-year period were identified. A full cost-benefit analysis would require the inclusion of net earnings change (i.e., earnings prior to and after leaving the rolls of CPP Disability), taxes paid to the Government on earnings, and total costs of delivering the program. Finally, it is recommended that future evaluation efforts be directed at determining why the results noted by this evaluation have occurred.

## **Client Profile and Important Characteristics**

The following is a summary profile of the 230 CPP Disability VR clients who started the program in 1998 and were included in the study group for this evaluation:

- The average age of participants was 40.3 years at the commencement of their vocational rehabilitation and 35.7 years when they started receiving CPP Disability benefits.
- Over half (56.5 percent) were married; male (62 percent) and had at least a high school degree (77.4 percent).



- Most lived in Ontario (46 percent) and had 1.3 children.
- The main medical conditions of participants are: mental disorder (21.3 percent); musculoskeletal disorder (20.9 percent); disease of the nervous system or sense organs (17.8 percent); and injury or poisoning (16.1 percent).
- The average duration on CPP Disability VR was 548 days (1.5 years) with an average expenditure for vocational rehabilitation services of \$6,154.

## Evaluation Findings

Highlights from the analysis of the relationship between characteristics of CPP Disability VR clients and outcomes are listed below. Only significant and relevant differences are reported.

- The older the participant, the less likely they were to cease receipt of the CPP Disability benefits but the more likely they were to complete the CPP Disability VR program. There is no substantial difference in the probability of obtaining employment for clients as they get older.
- Having children is associated with a lower likelihood to cease receipt of CPP Disability benefits.
- While overall gender or marital status does not have any effect on outcomes, married males are more likely to cease CPP Disability benefit receipt than single males.
- Having a higher level of education does not affect completing the CPP Disability VR program but increases the probability of ceasing receipt of CPP Disability benefits (in comparison to those with less than a high school degree). However, university graduates are less likely to obtain employment or substantial gainful employment (i.e., employment with earnings greater than the maximum CPP retirement benefit).
- A client's medical condition is statistically insignificant with regard to completing the program, except for endocrine conditions. The latter are less likely to complete CPP Disability VR, possibly due to the severity of the condition.
- Persons with infectious and parasitic conditions, neoplasm conditions and genitourinary conditions are more likely to cease receipt of CPP Disability benefits.
- Clients with two medical conditions are less likely to complete the program.

The relationships between program participation and key outcomes are presented below:

- Those who complete CPP Disability VR are 56 percent more likely to cease receipt of CPP Disability benefit receipt compared to a group of clients who did not complete the program, either because they dropped out before the end of the program or they simply never took vocational rehabilitation but were assessed as likely to regain employment or have reported employment earnings.

- Among all who cease receipt of CPP Disability benefits, those who completed the CPP Disability VR program are 15 percent more likely to move into employment and 11 percent more likely to move into substantial gainful employment in comparison to those who did not complete the program.
- Results suggest that the CPP Disability VR program generated gross cost savings to the CPP Account of approximately \$5,000 per client over the entire four year period of data available for this analysis. The actual savings for each individual are simply the difference between what would have been paid and what was paid in benefits.

# 1. Introduction

The CPP Disability Vocational Rehabilitation (CPP Disability VR) program is designed to help people who receive a Canada Pension Plan Disability benefit return to work<sup>2</sup>. It was established in 1997 as a successor program to the pilot program—National Vocational Rehabilitation—that operated over the 1992-1997 period. The two objectives of the CPP Disability VR program are:

- to provide reasonable, cost-effective vocational rehabilitation measures for CPP Disability beneficiaries to facilitate a return to any substantially gainful employment<sup>3</sup>; and
- to achieve cost savings to the CPP by reducing the average duration of benefits of those CPP Disability beneficiaries who complete vocational rehabilitation and gain the capacity to return to work.

Every year, approximately 200 CPP Disability clients take up CPP Disability VR services.

The evaluation was conducted in March 2003 with the objective to assess how effectively the CPP Disability VR program met its objectives. It was agreed, in discussions between Audit and Evaluation Directorate (formerly Evaluation and Data Development, EDD) and Income Security Programs (ISP) that a subsequent Phase II would expand on the knowledge acquired on Phase I and include qualitative analysis such as focus groups and surveys of participant and comparison groups. However, in light of the new Return to Work initiative, undertaken by ISP, the decision was made to evaluate those issues in a future comprehensive evaluation of return to work services for CPP Disability clients.

The evaluation describes the CPP Disability VR program and its participants and estimates the impact of participation on the probability of post-program employment and benefits cessation. For each program objective, estimates were calculated using different estimation techniques and several comparison groups with the goal of providing multiple lines of evidence in assessing program success. The analysis was based on Income Security Programs' (ISP) administrative data. Only participants who started their rehabilitation in 1998 were included in the reference group in order to allow for a significant number of years to elapse (four years) for outcomes to be measurable.

While an evaluation of the predecessor program (i.e., the National Vocational Rehabilitation program<sup>4</sup>) was undertaken, this is the first evaluation of the CPP Disability VR program.

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<sup>2</sup> The legislative authority for the funding of the VR Program falls under the administrative management of the Canada Pension Plan Act, Section 89 (1) (e).

<sup>3</sup> A substantially gainful occupation (SGO) may be used as a benchmark against which to compare the earnings of CPPD VR clients. SGO is defined as a job(s) that provides earnings exceeding the maximum CPP retirement benefit amount.

<sup>4</sup> See the evaluation report for the pilot program: "Evaluation of the National Vocational Rehabilitation Project", October 1996, SP-AH029E-10-96 located at <http://www11.hrdc-drhc.gc.ca/pls/edd/PPVOC.shtml>

This report of the current evaluation includes the following:

- an overview of the CPP Disability program;
- a summary of the evaluation issues and methodologies;
- a literature review on similar vocational rehabilitation programs and evidence of their possible impacts on outcomes;
- a summary of the main findings; and
- limitations and areas for future evaluation work.

This report also includes a number of appendices that provide more detailed information.

## ***2. Overview of the CPP Disability VR***

### **2.1 Background**

CPP Disability is the disability component of the Canada Pension Plan (CPP) which was established in 1966. Quebec operates its own Quebec Pension Plan (QPP), including a disability component. The CPP is a national contributory social insurance plan funded by the earnings of employees, employers and the self-employed. A disability benefit is payable to a contributor who is disabled, according to the provisions of the Act. The amount of the monthly disability benefit payable includes a flat-rate portion (\$364.49 in 2002) and an amount based on earnings, generally equal to 75% of the pension the individual would receive at retirement.

For 2002, \$2.70 billion in CPP Disability benefits were paid to more than 281,000 disability recipients. The maximum monthly benefit payable to a CPP Disability claimant was \$956.05 (in 2002).

According to the provisions of the CPP Act, each child of a contributor who is receiving a CPP disability benefit is entitled to a monthly flat-rate payment of \$183.77 (in 2002) as long as the child is under the age of 18, or is between the ages of 18 and 25 and attending school full-time. The children's benefit paid out about \$240.8 million to 90,000 eligible contributor families (in 2002).

Applicants must meet a minimum set of contributory requirements to be eligible for benefits: they must have paid into the plan for four out of the last six years. There is also a provision for late applicants. If an individual applied for the first time, but had stopped working so long ago that he/she no longer has CPP contributions in four of the last six years, and meets all the other conditions of eligibility, the individual may still be eligible for a benefit. As long as the individual had enough years of CPP contributions when he/she first became disabled, and as long as he/she is considered to be continuously disabled (as defined by CPP legislation) from that date up to the present time, he/she may qualify.

If the earnings and contributions criteria are met, the application is medically adjudicated by qualified professionals. The CPP Act states that a person is eligible for disability benefits only if he or she "...is determined in prescribed manner to have a severe and prolonged mental or physical disability..." The term prolonged means that a person's disability is expected to continue for a significant period after the time of application, and that its duration cannot be predicted with any certainty, or is likely to result in death. In Section 42(2) of the CPP Act, a "severe" disability is defined as one that impairs to such an extent that a person is "...incapable regularly of pursuing any substantially gainful occupation..." A person qualifies on medical grounds only when the "severe" and "prolonged" criteria are met simultaneously at the time of application. However, the severity of a disability is assessed first. If an applicant does not meet the "severe" criteria, the question of whether the disability is prolonged is not considered.

Applicants dissatisfied with a decision regarding their claim have three opportunities to have the decision reviewed. At the first stage, applicants may ask for a reconsideration. Reconsideration involves an administrative review by a different departmental adjudicator not involved in the initial decision. An appeal to a Review Tribunal is the first level of formal appeal, and the Pension Appeals Board is the second.

CPP Disability payments begin the fourth month after the date that the person is deemed to be disabled. The reassessment component of CPP Disability follows up with disability beneficiaries to make sure they continue to be eligible for benefits.

CPP Disability also supports beneficiaries' efforts to return to work through a range of work incentives and supports, including vocational rehabilitation services. The CPP Disability VR program was established in 1997 as a successor program to the pilot program—National Vocational Rehabilitation—that operated over the 1992-1997 period. Every year, approximately 200 CPP Disability clients take up CPP Disability VR services.

The number of clients who have successfully completed the program since 1998 and subsequently ceased benefits totalled 471 as of March 31, 2003.<sup>5</sup> As of this same date, there were 489 clients who were undergoing rehabilitation, in a job search or work trial. A detailed description of CPP Disability VR clients is provided in Section 2.4.

## 2.2 Program Objectives

The CPP Disability VR Program is designed to help people who receive a Canada Pension Plan Disability benefit return to work. The two objectives of the CPP Disability VR program are:

- to provide reasonable, cost-effective vocational rehabilitation measures for CPP Disability beneficiaries to facilitate a return to any substantially gainful employment; and
- to achieve cost savings to the CPP by reducing the average duration of benefits of those CPP Disability beneficiaries who complete vocational rehabilitation and gain the capacity to return to work.

## 2.3 Organization and Delivery

The CPP Disability VR program is administered and managed by Regional Headquarters (RHQs) in all regions with functional program direction provided by National Headquarters (NHQ) VR staff with the exception of Québec where the Government of Québec manages its own pension plan.

The program is delivered by about 30 case managers who screen CPP Disability beneficiaries as to their suitability for vocational rehabilitation, and manage the vocational rehabilitation process. On the basis of a client's vocational rehabilitation

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<sup>5</sup> ISP administrative data, 2004.

potential, an individualized vocational rehabilitation plan is developed with direct involvement of the client. Some of the services provided include vocational assessment, planning, skills development and job search assistance. These elements are intended to contribute towards achieving the goal of reintegrating CPP Disability clients into the work force and subsequently having their benefits ended. Vocational rehabilitation services are generally provided on contract through private rehabilitation service providers in the community.

Clients continue to receive their CPP Disability benefits during the rehabilitation period. On successful completion of the rehabilitation process, job search and a three-month work trial, disability benefits are ceased. Clients are made aware that should their original medical conditions deteriorate to the point where they are no longer able to work, they can submit a fast-track re-application for benefits.

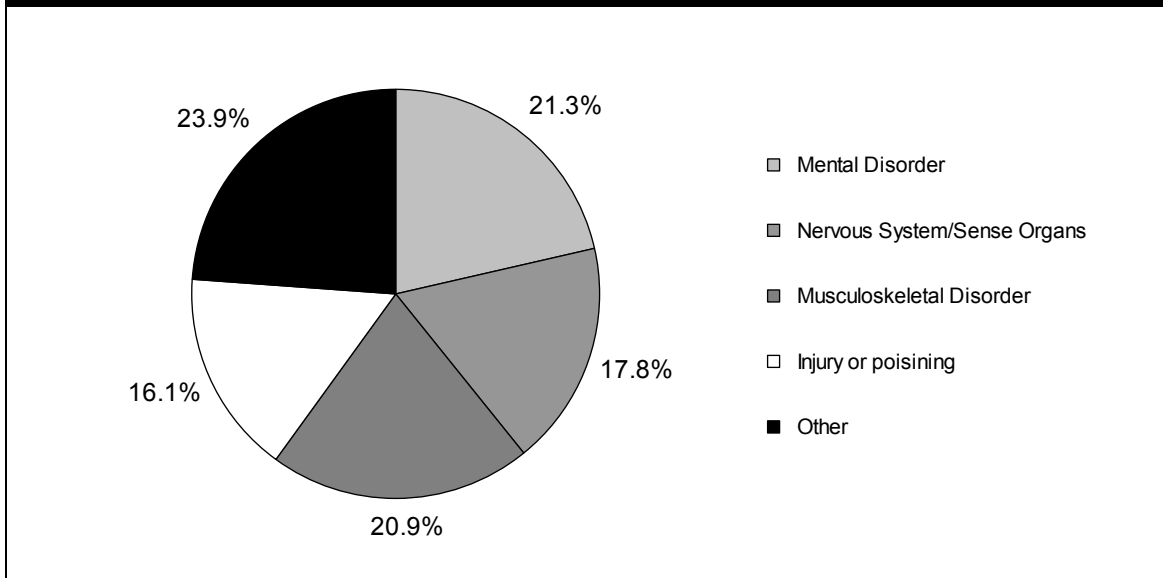
## **2.4 Profile of CPP Disability VR Recipients**

Table 1 in Appendix A provides definitions of the variables used in describing CPP Disability VR clients, as well as the basic descriptive statistics (the average value and standard deviation for those variables). The abbreviated variable as it is used in the statistical analysis is provided followed by a more expanded definition.

The following is a summary profile of the 230 CPP Disability VR clients who started the program in 1998 and were included in the study group for this evaluation:

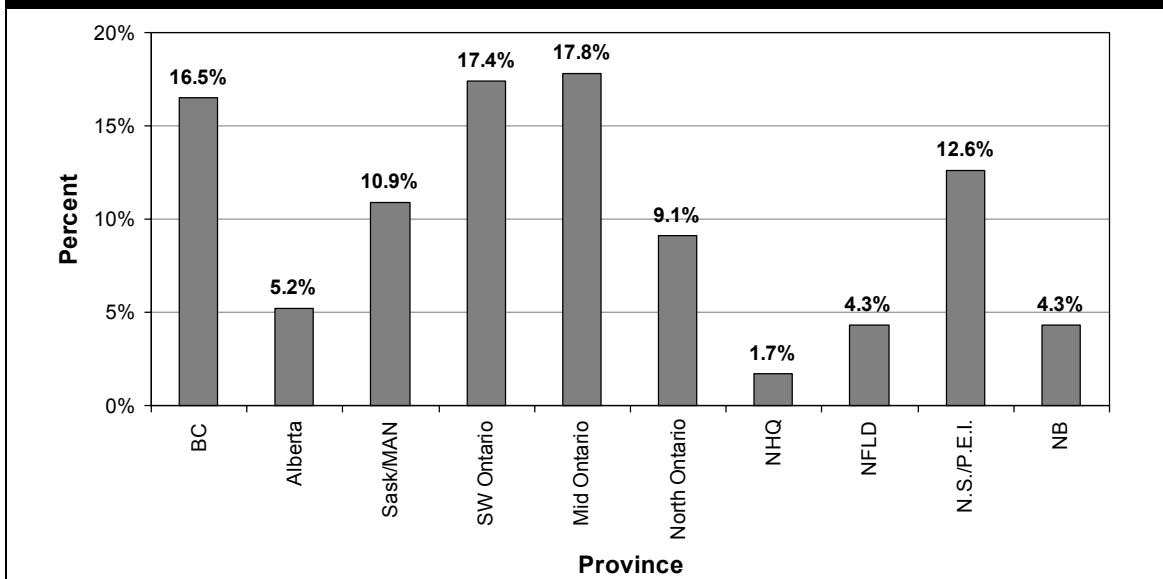
- The average age of participants was 40.3 years at the commencement of their vocational rehabilitation and 35.7 years when they started receiving CPP Disability benefits. These mean that VR participants had been on benefits for an average of four and a half years before starting vocational rehabilitation.
- Over half (56.5 percent) were married; male (62 percent) and had 1.3 children.
- Almost two-thirds had a maximum educational attainment of a high school degree with the rest distributed fairly evenly across the other education categories (less than High School, College or University).
- The main medical categories of diagnosis were: mental disorder: 21.3 percent; musculoskeletal: 20.9 percent; disease of the nervous system or sense organs: 17.8 percent; and injury or poisoning: 16.1 percent. Moreover, 28.7 percent of CPP Disability VR clients were diagnosed with a secondary medical condition and 6 percent were diagnosed with a tertiary condition.

**Exhibit 2-1**  
**1998 CPP Disability VR Clients Distribution by Medical Condition**



- A small proportion (5.2 percent) had some prior experience with CPP Disability VR. The average duration in the program for clients who started in 1998 was 548 days (1.5 years) with an average expenditure of \$6,154 on vocational rehabilitation services.
- Exhibit 2-2 shows the provincial distribution of the 230 CPP Disability VR clients in 1998. Approximately 44 percent were in Ontario, 16.5 percent were in British Columbia, 12.6 percent in Nova Scotia and P.E.I., 10.9 percent in Saskatchewan and Manitoba, 5.2 percent in Alberta and 4.3 percent in each of Newfoundland and New Brunswick.

**Exhibit 2-2**  
**Distribution of 1998 CPP Disability VR Clients by Province**



Note: slight deviation from a total of 100 percent due to rounding.



- With respect to the various outcomes, almost half (47 percent) of the 1998 CPP Disability VR clients completed their planned vocational rehabilitation program, while 53 percent did not. Almost half (48.7 percent) of the VR clients (completers and non-completers) went off the rolls of CPP Disability, the vast majority (92 percent of the 48.7 percent) because they were capable of working. Other reasons for going off the rolls included among other reasons: reached age 65 and therefore ceased to qualify or passed away.
- Of the 230 in the study group, 40 percent obtained employment, with 36 percent of these persons obtaining *substantial gainful employment* defined as employment with earnings greater than the maximum annual CPP retirement benefit amount. Sixty percent of the study group had not obtained employment. Of those who obtained employment, 88 percent had completed their planned vocational rehabilitation program.



## ***3. Evaluation Issues and Approach***

This section outlines the issues identified for the current evaluation of the CPP Disability VR program, the methodology used to undertake the current evaluation, and some of the strengths and weaknesses of the evaluation approach.

### **3.1 Evaluation Issues**

The evaluation of the CPP Disability VR program was undertaken to provide evidence of the possible impact of participation in the program for participants on employment outcomes. Specifically, the evaluation sought to assess the extent to which CPP Disability VR was able to achieve its objectives, which are:

- 1) to provide reasonable, cost-effective vocational rehabilitation measures for CPP Disability beneficiaries to facilitate a return to any substantially gainful employment; and
- 2) to achieve cost savings to the CPP by reducing the average duration of benefits of those CPP Disability beneficiaries who complete vocational rehabilitation and gain the capacity to return to work.

It should be noted that some evaluation issues could not be fully addressed. As it is common with many evaluations of recently-implemented programs, the evaluation was only able to observe a limited number of years of post-CPP Disability VR activities; in this case, four years for those who started the program in 1998. This poses limitations for the extrapolation of program effects in the long run. With additional years of data, it would be possible to extend the current analysis to examine the sustainability of the various outcomes over a longer post-program time period. As well, by doing so, it would be possible to estimate the expected length of time clients stay off benefits after receiving CPP Disability VR using techniques such as hazard estimation methods (e.g. Hennessey and Muller, 1994).

It is important to note that there are possible social benefits from participating in CPP Disability VR, not identified in the current evaluation. These could include, among others benefits, higher self-esteem, greater independence, improved set of generic work/career development/job search skills, lower use of health services, and greater community integration.

### **3.2 Evaluation Methodology**

The evaluation approach emphasized the use of multiple lines of evidence to ensure comprehensive and defensible results. As explained in the following sections, different assumptions, including multiple comparison groups and different methods for controlling for selection bias, were used to estimate program impacts. In a first stage, logistic

regression is used to estimate employment-related outcomes. Then, gross costs savings to the CPP Account are calculated using different comparison groups.

### **3.2.1 Logistic Regression and Employment Outcomes**

Four employment-related outcomes were examined in this study using logistic regression:

- the probability of completing CPP Disability VR;
- the probability of moving off the rolls of CPP Disability;
- the probability of obtaining employment; and
- the probability of obtaining substantial gainful employment, defined as earning a salary over the rate of CPP retirement benefit.

A logistic regression model was used to determine the probability that a client will be in each of these four states. This probability is expressed as a value between 0 and 1, with 0 being no probability at all and 1 indicating that the client will achieve the stated outcome with 100 percent certainty. For example, the probability that a client will leave the rolls of CPP Disability (whether they complete CPP Disability VR or not after starting it or never having participated in the program) is found to be 0.29. In other words, any randomly chosen CPP Disability client had a one in three chance to cease benefits. A logistic model was chosen to better account for the non-linear relationship between the dichotomous or binary dependent variables (outcomes) and the explanatory variables.

Individual client characteristics were added to the regression model to control for differences observed in clients other than program participation that may have affected outcomes. Characteristics included in this analysis were: age, gender, marital status, number of children, pre-disability educational attainment, disability type and province of residence.

Controlling for age was important since both the difficulty of returning to work and the expected future benefit period, until retirement, are related to age. Gender was included to control for systematic differences that may exist between men and women in their likelihood of returning to work. Marital status, number of children and the type of disability were also included. Marital status may capture household support (such as other income) and both marital status and the number of children may take into account household pressures reflecting dependency. The type of disability was included because there might be differences in the probability of returning to work by type of disability. This is analogous to variables controlling for the part of the body injured and the nature of injury in studies that have estimated the probability of returning to work with worker's compensation studies. Province dummy variables were used to reflect differences in provincial labour markets.

### 3.2.2 Comparison Group Design

To measure the degree to which the program had an impact, the outcomes of participants were compared to those of non-participants with similar characteristics. Ideally, a random assignment of clients into a participant group (treatment group) and a non-participant group (comparison group) would have allowed for a clear measure of program impact by examining the difference in their outcomes. Since random assignment was not feasible in this case, the best alternative was to construct a comparison group that resembled CPP Disability VR participants as closely as possible and interpret the difference in outcomes between these two groups as the net impact of the program. In other words,

**Net VR impact = outcome for VR participants – outcomes for non-participants**

Given that clients are either referred to the program by case managers or self-selected into the program, it is not entirely obvious which comparison group is closest to VR completers. The literature review (see Section 4) identified some potential comparison groups.

*Internal* comparison groups formed of dropouts (clients who enrolled but did not completed vocational rehabilitation) were utilized. Such dropouts were subdivided into non-starters who enrolled in CPP Disability VR but did not start the program and non-completers who enrolled and received some vocational rehabilitation but did not complete the program. Dean and Dolan (1991a, 1991b) argue that dropouts form good comparison groups because they are similar to the treatment group in that they are clearly eligible for vocational rehabilitation (they simply did not complete or receive any vocational rehabilitation services) and it is possible that unobservable characteristics are being controlled for since they have been selected into the program in the same manner as the completers. It can equally be argued that dropouts may be less motivated and thus did not complete the program or are more ambitious and therefore found employment on their own. Overall, Dean and Dolan concluded that dropouts are the preferred comparison group, relative to the other options. The U.S. General Accounting Office (1993) and Hayward and Schmidt-Davis (2002) also used dropouts as a comparison group in their studies of general US vocational rehabilitation programs. As outlined later, the current evaluation uses both non-starters and non-completers combined into a single comparison group referred to as “dropouts”. There were not enough observations on non-starters who enrolled but received no vocational rehabilitation to form a sub-comparison group.

Also used were *external* comparison groups are drawn from clients on the rolls of CPP Disability who did not have any vocational rehabilitation (i.e., they were not dropouts or completers) and who had the potential to return to work, and who may or may not have obtained employment as it was the case with CPP Disability VR recipients. A 10 percent random sample of the reassessment file (Rules Based Reassessment System, RBRS)<sup>6</sup> was drawn to select two such comparison groups. The first group consisted of persons who had been flagged at their initial application for CPP Disability as clients likely to regain their earnings capacity and return to work (termed *initially flagged* for reassessment).

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<sup>6</sup> The reassessment file involved the time period 1990-2001 with those receiving any CPPD VR filtered out. The comparison group for the cost savings estimates were restricted to those who terminated in 1998, as was the case with the treatment group of CPPD VR completers from the participant file.

When combined with the dropouts from the participant file, these formed the *intermediate comparison group*. Another external comparison group consisted of persons who had been reassessed and deemed capable of returning to work on the basis of their actual or potential earnings (termed *reassessed* because of earnings). When combined with the intermediate comparison group (dropouts plus those initially flagged for reassessment), this formed the *broad comparison group* since it includes all of the potential comparison groups.

Therefore, three comparison groups were used throughout the study for calculating gross cost-savings:

- **tight comparison group** composed of those who enrolled but dropped out of the CPP Disability VR program (dropouts).
- **intermediate comparison group** composed of 1) dropouts and 2) those initially assessed by CPP Disability case managers as likely to regain capacity to work as indicated by the RBRS<sup>7</sup>.
- **broad comparison group** composed of 1) dropouts, 2) those without any CPP Disability VR participation but were initially flagged by case managers as likely to regain capacity to work as indicated by the RBRS<sup>8</sup>, and 3) those without any vocational rehabilitation but were reassessed<sup>9</sup> due to reported earnings (from RBRS) or a return to work.

Using different comparison groups and comparing the different results allowed for better understanding of the nature of the selection bias that may exist because clients are not necessarily randomly selected into the program. In addition, econometric methods were used to minimise this selection bias to the extent possible, as explained in Section 3.2.3.

### 3.2.3 Addressing Selection Bias

While every effort was made to construct a comparison group that resembled CPP Disability VR clients as much as possible, it was still possible for the comparison group to be slightly different from the program participants. In addition to the observable characteristics that were included in the analysis, there may have been other unobservable characteristics that affected the outcomes. This is known as selection bias. An example of an unobservable characteristic is motivation which is generally not easily captured in the analysis and may lead some individuals to be more likely to enroll themselves into the program.

A survey of CPP Disability VR case managers<sup>10</sup> in 2003 indicated that the majority of applicants contacted the Department themselves to enrol in the program. This information

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<sup>7</sup> These are the clients flagged at application as “PSRA” (PreScheduled ReAssessment) or “PSRA Review” in the RBRS.

<sup>8</sup> “PSRA” and “PSRA Review” only.

<sup>9</sup> These are all the other types of reassessment types in the RBRS (had earnings from CPP/Employment Insurance (EI) files, Return to Work (RTW), Record of Earnings (ROE), etc.).

<sup>10</sup> Conducted in March 2003

confirms the presence of some self-selection bias which generally makes it difficult to construct a perfect comparison group and calculate impacts.

Similar studies of other vocational rehabilitation programs used various estimation techniques with the aim of controlling for differences between participants and non-participants, namely, Ordinary Least Squares (OLS) regression and Heckman selection procedures<sup>11</sup>.

As discussed earlier, this study took into account selection bias where possible using the methods presented below:

- constructing a tight comparison group to be as similar to CPP Disability VR clients as possible. As explained in the previous section (3.2.2), dropouts from the program are thought likely to be most similar to CPP Disability VR completers;
- estimating the probability of exiting CPP Disability or the probability of gaining employment using Heckman-type selection correction methods, i.e., two-stage least squares regression, a method designed specifically for addressing the issue of selection bias; and
- using propensity score matching methods to obtain comparison groups that are more similar to the CPP Disability study group, an alternate method for addressing selection bias.

### **3.2.4 Administrative Data**

The four administrative data files used for the evaluation were:

- **Rehabilitation Case Management System (RCMS):** includes a wide range of variables for each client, e.g. demographics, disability type, etc. It is restricted in its capacity for aggregate data analysis.
- **Rules Based Reassessment System (RBRS):** a transaction file which includes information on clients identified for reassessment and on clients who have been reassessed. Within this file are those who self-reported a return to work.
- **Master Benefit File (MBF):** a transaction file which includes information on CPP Disability clients in pay (in receipt of benefits) such as identifiers and client characteristics.
- **Record of Earnings Master File (ROEMF):** contains information on earnings and contributions to the CPP.

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<sup>11</sup> Allingham and Hyatt, 1995.

These are all internal administrative databases maintained by Income Security Programs branch. Data definitions and descriptive statistics on the variables derived from the administrative data are provided in the section that profiles the CPP Disability VR clients in Appendix A Table 1.

Data was extracted for the years 1990 to 2001, the last year in which earnings information was available from the ROEMF, at the time of the evaluation. The reference group for the study, 236 participants who started in 1998, came from the RCMS, a file tracking system for CPP Disability VR. These clients were then linked<sup>12</sup> to the other three files to obtain general benefit and earnings information. When a particular file had missing information for the key variables used in the analysis, it was removed. The final number of participants available for analysis was 230 clients.

The comparison group was drawn from the RBRS, which includes information on all CPP Disability clients who were reassessed; their records were linked to the MBF and the ROEMF to gain benefit and earnings information. Since there are over 35,000 clients on the RBRS, a 10 percent random sample was drawn for the analysis (3,453 observations). Those with CPP Disability VR exposure were excluded from the RBRS-drawn comparison groups.

### **3.3 Limitations and Areas for Future Evaluation Work**

In addition to the limitations noted above with respect to identifying appropriate comparison groups and dealing with selection bias, constraints were provided by the small number of years of data on which to conduct the analysis. It is recommended that a further evaluation look at the following:

#### **Full costs and benefits analysis**

Incorporating the total costs of delivering the program and other benefits (earnings changes, increase in tax revenues to the Government from earnings premium) would allow for the computation of a more precise estimation of the benefits versus costs for this program. Estimating earnings impacts is one important component of the full cost-benefit analysis. An evaluation in Australia (Commonwealth Rehabilitation Services, 2003) examined both earning changes, savings from unpaid benefits and costs of the program and found significant net savings to the Government.

#### **Identify social benefits of program**

It is important to note that there are possible social benefits from participating in vocational rehabilitation programs, not identified in the current evaluation. These could include, among other benefits, higher self-esteem, greater independence, improved set of generic work/career development/job search skills, lower use of health services, and greater

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<sup>12</sup> The data files were used in accordance with the confidentiality provisions in the *Human Resources Development Act*, the *Privacy Act*, the *Employment Insurance Act*, the *Income Tax Act*, the *Canada Pension Plan Act*, and the *Old Age Security Act*, and disclosure criteria as contained in agreements with the provinces, territories and other government departments and agencies.



community integration. A possibility is to survey CPP Disability VR recipients to obtain a better idea of what these social benefits are as well as identify factors that participants felt led to their successful/unsuccessful recovery and additional measures that may improve the program to better serve the needs of this clientele.

### **Consider possible substitution with other similar programs**

In order to fully understand the uniqueness of this program, it would be useful to model the possible substitution among the vocational rehabilitation components of the various disability programs.

### **Better understand who forms the dropouts**

A study of the dropouts would provide additional reassurance about the validity of using dropouts as a comparison group and the credibility of the outcome estimates. It would also help understand what factors led to their dropping out of the program.

### **Estimate the relationship between CPPD VR completion and long-term benefits receipt**

In a future evaluation, it is possible to use hazard estimation techniques (e.g. Hennessey and Muller, 1994) to estimate the impact of CPP Disability VR completion on the expected time of remaining off CPP Disability benefits. It is also possible to test for duration dependence, i.e., whether being on CPP Disability creates conditions that make it more likely for clients to remain on CPP Disability.

### **Extend current analysis with additional years of data**

The additional data would also facilitate other extensions of the current analysis: examining the sustainability of the various outcomes over a longer post-program time period; and examining more detailed outcomes such as returning to work, staying at home, and accessing other programs.



## *4. Highlights of Literature Review*

Prior to proceeding with formulating the design of the evaluation, a literature review was undertaken of prior studies which analysed the role of vocational rehabilitation programs in helping disability clients return to work. Studies were selected on the basis of the extent to which they provided evidence of vocational rehabilitation impact on employment outcomes and cost savings. This can assist in undertaking the current evaluation, specifically, the identification of data and methodologies, comparison groups, control variables, empirical specifications, and strengths and weaknesses of alternative approaches. A detailed reporting of the literature review can be found in Appendix B.

In brief, the literature review had the following implications for the current evaluation:

- Only one previous evaluation of the predecessor pilot to the current CPP Disability VR program exists. That study used OLS regression to approximate the program's impact. It found a positive impact on returning to work.
- Only a few studies dealt with selection bias. Selection bias exists because vocational rehabilitation services are not randomly assigned but rather self-selected by persons with disabilities or assigned by program administrators. This selection is generally based on unobserved characteristics of the participants that may influence the program's outcomes, other than program participation itself, and is difficult to account for. For example, highly motivated individuals will choose to join the vocational rehabilitation program and are therefore more likely to have successful employment outcome in the first place, notwithstanding other factors.
- Obtaining a meaningful comparison group is a perpetual problem. A valid comparison group is needed in order to measure net impacts, i.e., those outcomes that can be attributed solely to participation to the program. The difficulty in obtaining a control group based on pure random assignment has resulted in many studies having focussed on vocational rehabilitation recipients only. These studies were thus only able to examine impacts by types or amount of vocational rehabilitation or by how success varies by different characteristics of vocational rehabilitation recipients.
- Some studies used program dropouts as the comparison group on the grounds that they were selected for the program and therefore most closely resemble vocational rehabilitation participants even though they did not complete the program.
- Obtaining employment is generally regarded as the crucial measure of success, with some studies requiring it to be for a certain period of time such as six months for it to be considered successful.

- Cost-benefit studies have used increases in wages and savings in disability payments as measures of benefits. Several studies have estimated benefit/cost ratios, i.e., dollars saved for every dollar spent on vocational rehabilitation. However, these ratios varied from 0 to 50/1. For vocational rehabilitation in the U.S. Social Security System, however, the ratios were typically less than 2/1 and often less than 1, due likely because of the severity of the disabilities.
- Studies on vocational rehabilitation in general or vocational rehabilitation under workers' compensation schemes are inconclusive. Studies on vocational rehabilitation in the U.S. Social Security Disability system tend to find that few ever return to work in part because of the severity of the disabilities and because there was little monetary incentive to do so.

Overall, there is no consensus in the literature on the impact of vocational rehabilitation in general or under workers' compensation schemes with some studies finding negative, zero or positive effects.

## ***5. Effect of CPP Disability VR on Outcomes***

In order to assess the possible effect of CPP Disability VR activities, four possible outcomes for clients were examined:

- the probability of completing CPP Disability VR;
- the probability of moving off the rolls of CPP Disability;
- the probability of obtaining employment; and
- the probability of obtaining substantial gainful employment.

### **5.1 Impact of Client Characteristics on Outcomes**

A logistic model was used to better account for the non-linear relationship between the dichotomous or binary dependent variables (outcomes) and the explanatory variables.

Individual client characteristics were added to the regression model to control for differences observed in clients other than program participation that may have affected outcomes. Characteristics included in this analysis were: age, gender, marital status, number of children, pre-disability educational attainment, disability type and province of residence.

As presented in Table 2 in Appendix C, it was found that the older the client, the higher the probability of completing CPP Disability VR but lower the probability of ceasing CPP Disability benefits receipt, with no substantial difference in their probability of obtaining employment. For every 10 years since the onset of the disability, all clients have a 0.08 (i.e.,  $10 \times 0.008$ ) increase in the probability of completing the program relative to the average probability of 0.48. The client had a 0.08 (i.e.,  $10 \times 0.008$ ) reduction in the probability of ceasing CPP Disability benefits receipt relative to the average probability of 0.29.

While overall gender or marital status does not have any effect on outcomes, married males are more likely to cease CPP Disability benefit receipt than single males. Having children is associated with a lower likelihood to cease receipt of CPP Disability benefits.

Having a higher level of education has no effect on the probability of completing the program but increases the probability of moving off the rolls of CPP Disability.

Similarly, clients with an endocrine condition appear also to have been much less likely to complete CPP Disability VR, which may have been a reflection of the severity of endocrine conditions. The effects for other outcomes related to medical condition were statistically insignificant with the exception of a higher probability for persons with infectious and parasitic conditions, neoplasm conditions and genitourinary conditions to have moved off the rolls of CPP Disability.

Clients with a secondary medical condition were 0.16 less likely to complete CPP Disability VR. This is a significant difference given the average probability of completion of 0.48. However, differences in results for those having a third medical condition are not statistically significant. As expected, clients with previous experience with CPP Disability VR are also a lot more likely to complete the program (by 0.314).

## 5.2 Impact of CPP Disability VR Completion on Outcomes

The regression analysis found that completing the program (Group A in Exhibit 5-1) is associated with a 55.7 percent increase in the probability of moving off the rolls of CPP Disability relative to an intermediate comparison group of non-completers, i.e., 1) those who started but did not complete the program (dropouts) or 2) those who never took CPP Disability VR but were initially assessed as likely to regain capacity to work or were reassessed because they reported earnings subsequently<sup>13</sup>.

Moreover, this group of CPP Disability VR completers were also 15.3 percent more likely than the comparison group to regain employment and 11.4 percent more likely to obtain substantially gainful employment, i.e., employment with earnings greater than the maximum CPP retirement benefit, after leaving the rolls of CPP Disability.

As a second means of comparison, the dropouts are added to the CPP Disability VR completers to form Group B, i.e., those with program exposure. The group with CPP Disability VR exposure is compared to those with who did not receive any vocational rehabilitation services. The results continue to show an increase in the probability of moving off the rolls of CPP Disability and gaining employment, although on a much smaller scale (15.5 percent compared to 55.7 percent). This highlights the importance of completing CPP Disability VR as opposed to simply starting it.

<b>Exhibit 5-1</b>				
<b>Net Impacts of CPP Disability VR on Program Completion, Benefit Receipt, and Employment</b>				
<b>Treatment group (below)</b>	<b>Change in probability<sup>14</sup> of completing CPPD VR</b>	<b>Change in probability of moving off the rolls of CPPD</b>	<b>Change in probability of obtaining employment</b>	<b>Change in probability of obtaining gainful employment</b>
<b>Group A: CPPD VR completers</b>	Compared to some CPPD VR (dropouts) or no CPPD VR at all			
	n/a	0.557***	0.153***	0.114**
<b>Group B: CPPD VR exposure (completers and dropouts)</b>	Compared to no VR at all			
	n/a	0.155***	0.100**	0.084
<b>Sample size</b>	220	2,773	754	754

Note: Statistical significance is denoted by \*\*\* and \*\* respectively at the 0.01 and 0.05 levels.

<sup>13</sup> Clients with no CPP Disability VR exposure are drawn from the Reassessment File either because they were likely to return to work (flagged at application as PSRA) or had reported some earnings (from CPP/EI or Record of Earnings files).

<sup>14</sup> The change in probability is obtained from a logistic regression and can be interpreted as the probability that a client 1) completes CPP Disability VR; 2) move off the rolls of CPP Disability; 3) obtains employment; or 4) obtains substantial gainful employment, after taking into consideration their demographic characteristics.

### 5.3 Impact of CPP Disability VR Expenditures on Outcomes

Additional expenditure on CPP Disability VR activities (of \$1,000) is associated with an increase in the probability of completing the program (by 33.4 percent) and moving off the rolls of CPP Disability (by 2.4 percent). However, expenditures levels do not seem to have an impact on the obtaining employment as the results were statistically insignificant.

These results must be interpreted with care as it is not clear that additional program expenditures directly result in participants completing the program and/or moving off the rolls of CPP Disability. Other factors may be the cause.

<b>Exhibit 5-2</b>				
<b>Net Impacts of Additional CPPD VR Expenditures on Program Completion, Benefit Receipt, and Employment</b>				
	<b>Completing CPPD VR</b>	<b>Moving off the Rolls of CPP Disability</b>	<b>Obtaining Employment</b>	<b>Obtaining Substantial Gainful Employment</b>
<b>CPPD VR expenditures</b>	0.034***	0.024***	0.002	0.001

Note: Statistical significance is denoted by \*\*\* at the 0.01 level.

### 5.4 Summary of Impact Estimates

Overall, the results suggest that completing CPP Disability VR is associated with higher probabilities of moving off the rolls of CPP Disability compared to the broad comparison group (dropouts plus those with no exposure to CPP Disability VR). Furthermore, for those who move off the rolls of CPP Disability, completing the program is associated with higher probabilities of obtaining employment and substantial gainful employment, compared to the broad comparison group (dropouts plus those with no exposure to VR).





## 6. *Gross Savings*

Under ideal conditions, an analysis of the cost savings that result from persons moving off the rolls of CPP Disability due to CPP Disability VR would require data for a long post-program period in order to determine how long participants remained off CPP Disability. It would also require a comparison group who did not participate in the program but who otherwise are similar in observed and unobserved characteristics to the treatment group that received the program. Given that this ideal comparison group did not exist, a number of comparison group strategies, based on different assumptions, were used to build as similar a group as possible. Multiple comparison groups allowed the creation of an upper and lower bound estimate of the cost savings of the program as well as to check the sensitivity of the estimates among the different comparison groups and their associated assumptions of comparability.

Up to three comparison groups (non-completers of the CPP Disability VR program) were used for estimating the gross savings to the CPP Account. First, there is the **tight comparison group**, composed of those who enrolled but dropped out of the VR program. The **intermediate comparison group** was composed of dropouts and those initially assessed as likely to regain employment by case managers in the RBRS<sup>15</sup>. Lastly, the **broad comparison group**, was composed of dropouts, those without any vocational rehabilitation services but initially assessed as likely to regain capacity to work (in RBRS), and those without vocational rehabilitation services but were reassessed due to subsequent reported earnings (in RBRS).

The data included persons who started their vocational rehabilitation in 1998, with subsequent information for the years 1999, 2000 and 2001. The resulting estimate of years employed (and hence years off the rolls of CPP Disability based on the year the benefits ceased) is based on a simple average of the years the person was employed over the period 1998-2001. Nevertheless, the relative magnitude of savings for CPP Disability VR completers versus dropouts is informative.

### 6.1 Simple Average Savings

As a first step, a simple calculation was obtained to estimate the savings post CPP Disability VR. This calculation basically provides the difference between what would have been paid should the individual had continued receiving benefits and what actually was paid (B\*C).

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<sup>15</sup> Flagged as “PSRA” or “PSRA Review” in the RBRS file.

<b>Exhibit 6-1 Savings Calculation</b>					
<b>A</b>	<b>B</b>	<b>*</b>	<b>C</b>	<b>*</b>	<b>D</b>
<b>Savings to CPP =</b>	<b>Number of years of employment since CPPD VR</b>	<b>*</b>	<b>Annual average CPP Disability payout per person</b>	<b>*</b>	<b>Number of clients who left CPP Disability (who regained work capacity)</b>

<b>Exhibit 6-2 An Example of Calculation of Savings due to Post-CPPD VR Employment</b>							
	<b>Savings to CPP</b>	<b>=</b>	<b>Number of years of employment since CPPD VR</b>	<b>*</b>	<b>Annual average CPP Disability payout per person</b>	<b>*</b>	<b>Number of clients who left CPP Disability<sup>16</sup></b>
Completed CPPD VR	\$1,711,963		2.68		\$7,259		88
Dropouts (tight)	\$216,480		2.00		\$7,216		15

Next, the difference in cost savings between a group of CPP Disability VR completers and non-completers was calculated.

<b>Exhibit 6-3 Gross Savings<sup>17</sup> Due to Post-CPPD VR Employment</b>				
<b>Savings for CPPD VR Completers</b>	<b>=</b>	<b>Savings for program dropouts</b>	<b>=</b>	<b>Difference in savings</b>
\$19,454	-	\$14,432	=	\$5,022
(2.68*\$7,259)		(2.00*\$7,216)		

The average savings from employment for the CPP Disability VR completer group was \$19,454 (2.68\*\$7,259) and \$14,432 (2.00\*\$7,216) for the tight comparison group of dropouts. Savings due to employment for the comparison group of dropouts (some of dropouts also returned to work) were then calculated. The average length of time on employment for dropouts was less than what it was for the completers (2 years versus 2.68 years). This translates into a total estimated gross saving of \$5,022 on average per CPP Disability VR client over the entire four year period (see Appendix D) for an estimated gross savings of approximately \$440,000<sup>18</sup> to the CPP Account.

<sup>16</sup> The sample comprised 103 individuals: 88 who completed CPP Disability VR and 15 who dropped out. These numbers were obtained from the initial 230 CPP Disability VR participants after excluding those who remained on CPP Disability or exited for other reasons such as death, retirement (over 65 years old) or other extenuating circumstances.

<sup>17</sup> Does not include program-related administrative expenditures required to obtain net savings to the CPP Account.

<sup>18</sup> \$5,022\*88=\$441,936.

The same calculations between the CPP Disability VR completers and the dropouts were done using substantial gainful employment as an outcome measure. Savings calculations presented in Table 3 in Appendix D show an estimated saving of \$3,971 per client over the entire four year period. One way of viewing the difference between those who gained employment versus those who gained substantial gainful employment is that quality matters in measuring outcomes. Both are cost savings for the Department but it can be viewed that a true cost saving exists only if the person had employment that paid them at least as much as they otherwise would have received on CPP Disability (as in the case for those with a substantially gainful job).

The results also suggest that the broad comparison group (dropouts, those initially assessed as likely to regain employment and those from the reassessment file who were reassessed due to reported earnings) may not be as comparable to CPP Disability VR participants as the dropout group. The effect of completing CPP Disability VR on cost savings becomes non-existent or slightly negative when CPP Disability clients are compared to the broad comparison group. A possible reason is that the broad comparison group was already expected to be regaining employment, as signalled initially on the RBRS, and moreover, unlike the tight comparison of dropouts, they were never enrolled in CPP Disability VR. This hypothesis is reinforced by the fact that positive treatment effects are found when the intermediate comparison group (dropouts and only those initially assessed as likely to regain employment) is used in the cost savings analysis.

## 6.2 OLS Regression and Heckman-Type Selection Correction Procedure

The same calculation of the difference between savings between CPP Disability VR clients and the comparison groups was repeated with the additional step of running an **Ordinary Least-Square (OLS) regression** to control for individual observable characteristics that may influence the cost savings. A caveat with these results is that the small number of observations available for analysis (n = 103) may make the results imprecise. Thus, only statistically significant results are presented in this report.

Accounting for individual characteristics using OLS leads to a total gross savings of \$7,071 over the entire four year period using the tight comparison group and \$6,425 using the intermediate comparison group. This is slightly higher than the simple average calculations.

When the analysis shifts to substantial gainful employment using the OLS procedure, CPP Disability VR completers contributed to a total of \$5,435 in savings over the four years when compared to the intermediate comparison group.

A **Heckman Two-Stage Least Square regression** was also performed to attempt to control for unobservable characteristics, i.e., selection bias. The net effect of completing CPP Disability VR was statistically insignificant, possibly due to the small number of observations. Thus, the evaluation was unable to make any meaningful statement about the magnitude of the treatment effect using this method.

## 6.3 Matching on Propensity Score

**Propensity score matching methods** solves the problem of having to match the participant and comparison groups on many characteristics. Using a propensity score allows an investigator to control for many characteristics simultaneously by matching on a single value: the score, which is estimated through a logistic regression. The propensity score is then used to match CPP Disability VR clients to non-program clients having the same score<sup>19</sup>. The difference in the outcomes of these two groups becomes the net outcome measure. However, it is important to note that this method can help reduce selection bias due to unobservable characteristics but may not completely eliminate it<sup>20</sup>.

While the evaluation regards the \$5,000 estimate for the four years as the most reasonable, substantial gross savings were found using propensity score matching methods: over \$16,000 for the four years when compared to the tight comparison group of dropouts. The same was found when using substantial gainful employment as the outcome measure. However, caution should be taken when interpreting these results in light of the small number of observations. When the group of those assessed at the time of CPP Disability application as likely to regain capacity to work<sup>21</sup> along with dropouts is used as comparison group (i.e., the intermediate comparison group), only \$5,883 in cost savings for the four years due to substantial gainful employment was obtained. Again, the broad comparison group also produced insignificant effects in this case.

## 6.4 Summary of Gross Savings Estimates

Overall, the analysis suggests that the estimate of total gross savings per successful client of about \$5,000 over the four years of data is the most reasonable. The \$5,000 estimate is close to the various statistically significant estimates based on the alternate regression procedures and comparison groups presented above.

Moreover, the intermediate comparison group of those with no CPP Disability VR but were initially flagged as likely to regain capacity to work along with dropouts seem to be the most comparable to program clients than the broad comparison group (of dropouts, those initially flagged as likely to return to work and those later reassessed due to earnings). This is probably because the latter comparison group includes individuals that already regained employment and had traits that set them apart in the first place. Further evaluation work can be directed to determining the net savings (i.e., gross savings minus program costs) and the point at which the program investment is off-set by the estimated savings.

It is also important to note that the cost savings calculations done in this study differ from existing CPP Disability measures of cost savings. The difference arises because of a comparison group that was used in this current evaluation to add more precision to the calculation, i.e., outcomes between participants and non-participants are compared.

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<sup>19</sup> In this study, caliper matching on the propensity score is used along with a common support requirement.

<sup>20</sup> Heckman, Ichimura, Smith and Todd (1998).

<sup>21</sup> These individuals were pre-scheduled for a reassessment as they were perceived as likely to regain work by the case manager at the initial meeting.

The existing CPP Disability cost savings calculations are obtained by multiplying the average amount of annual CPP Disability benefit payment per client by the number of clients who ceased benefits after CPP Disability VR participation. It is possible that these participants would have ceased their CPP Disability benefits on their own even in the absence of the CPP Disability VR program. In the current evaluation, CPP Disability VR participants' outcomes are compared to the outcomes of a comparison group constructed to be as similar as possible to the participants. The difference between outcomes for the two groups is then credited to participation in the program.



## *7. Summary of Findings*

### **CPP Disability VR completers more likely to move off rolls of CPP Disability than similar clients**

Overall, the analysis suggests that completing CPP Disability VR enhances employment and hence has the potential to generate cost savings to the CPP Account. The evaluation found that program clients are 56 percent more likely to leave the rolls of CPP Disability relative to a comparison group composed of 1) those who enrolled but dropped out of CPP Disability VR and 2) CPP Disability recipients who never take vocational rehabilitation but are initially assessed as likely to regain employment or reassessed due to subsequent earnings.

### **CPP Disability VR completers are more likely to gain employment**

Compared to others who also moved off the rolls of CPP Disability, CPP Disability VR clients were 15 percent more likely to move into employment and 11 percent more likely to move into substantial gainful employment, defined as employment with earnings greater than the maximum annual CPP retirement benefit amount.

### **CPP Disability VR generates gross savings to the CPP Account of approximately \$5,000 per client**

Not taking into account CPP Disability VR program costs, it is estimated that participation in the program generates a gross savings to the CPP account of about \$5,000 per client for the four years of data available for this analysis (up to year 2001). Additional years of data post-CPP Disability VR participation and program costs will increase the precision of these numbers, assuming that program graduates maintain employment.





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## *Appendix A: Client Characteristics*

**Table 1 – Profile of CPP Disability VR Clients and Variable Definitions**

Variable	Definition	Mean	Standard Deviation
AgeVR	Age at commencement of CPPD VR (years)	40.3	6.9
AgeDisabled	Age at time of disability (years)	35.7	7.3
Not married	Single, separated, widowed, divorced	0.435	0.503
Married	Married or common law	0.565	0.497
Female	Female	0.383	0.513
Male	Male	0.617	0.487
Number Children	Number of children	1.252	1.284
OtherEducation	Less than high school graduate	0.122	0.328
HighSchool	High school graduate	0.652	0.477
CollegeDiploma	College diploma	0.113	0.317
Univ.Diploma	University graduate	0.113	0.317
Infection	Infective and parasitic disease	0.030	0.172
Neoplasm	Neoplasms (benign or malignant tissue growths)	0.035	0.184
Endocrine	Endocrine & metabolic	0.013	0.114
Blood	Blood and blood forming organs	0.000	0.000
Mental	Mental disorder	0.213	0.410
Nervous system	Disease of nervous system or sense organs	0.178	0.384
Circulatory	Circulatory disease	0.065	0.247
Respiratory	Respiratory disease	0.013	0.114
Digestive	Disease of digestive system	0.052	0.223
Genitourinary	Disease of the genitourinary system	0.017	0.131
Pregnancy comp	Pregnancy complications	0.000	0.000
Skin&tissue	Disease of skin and subcutaneous tissue	0.000	0.000
Musculoskeletal	Musculoskeletal disorder	0.209	0.407
Congenital	Congenital anomalies	0.009	0.093
Perinatal	Perinatal conditions (refers to the time just before, during and immediately after birth)	0.000	0.000
Symptoms	Symptoms	0.004	0.066
Radiology	Radiology	0.000	0.000
Ill defined	Ill defined causes	0.000	0.000
Injury/poison	Injury and poisonings	0.161	0.368

<b>Variable</b>	<b>Definition</b>	<b>Mean</b>	<b>Standard Deviation</b>
Comorbid2	Secondary condition also	0.287	0.453
Comorbid3	Tertiary condition also	0.061	0.240
PriorVR	Any prior experience with CPPD VR	0.052	0.223

DurVR	Duration of CPPD VR (days)	548.0	371.1
VRExpenditure	Total CPPD VR expenditure (in \$1000)	6.1514	6.4667

Br. Columbia	British Columbia	0.165	0.372
Alberta	Alberta	0.052	0.223
Sask/Manitoba	Saskatchewan and Manitoba	0.109	0.312
SWOntario	South Western Ontario	0.174	0.380
MidOntario	Central Ontario	0.178	0.384
NorthOntario	Northern Ontario	0.091	0.289
NHQ	National Headquarters	0.017	0.131
Newfoundland	Newfoundland	0.043	0.204
NovaScotia/PEI	Nova Scotia /Prince Edward Island	0.126	0.333
NewBrunswick	New Brunswick	0.043	0.204

CompleteVR	Completed CPPD VR, i.e., CPPD VR ceased	0.470	0.500
IncompleteVR	Did not complete, i.e., CPPD VR closed	0.530	0.500

OffCPPD	Benefits ceased, all reasons	0.487	0.501
OffRegCap	Benefits ceased, regained capacity	0.448	0.498
Died	Benefits ceased, died	0.035	0.184
Age 65	Benefits ceased, reached age 65 (retired)	0.000	0.000
Other	Benefits ceased, other reasons	0.004	0.066
NotOffCPPD	Still on CPP Disability benefits	0.513	0.501

GainfulEmp	Employed with positive post-program earnings	0.400	0.491
NotGainfulEmp	Not gainfully employed	0.600	0.509

SubGainEmp	Obtained substantially gainful employment > maximum CPP retirement benefit amount	0.357	0.480
NotSubGainEmp	Did not obtain substantially gainful employment	0.643	0.520

<b>Sample Size</b>	<b>Number of observations</b>	<b>230</b>	
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# *Appendix B: Literature Review*

## **1. Canadian Studies**

### **1.1 Evaluation of National Vocational Rehabilitation Program**

The study of the predecessor pilot to the current CPP Disability VR program, the National Vocational Rehabilitation Program, reports positive impacts of vocational rehabilitation services receipt on returning to work. The conclusions were based on a multiple regression analysis of determinants of having successfully returned to work using data from a survey of CPP Disability recipients. It was found that clients who participated in vocational rehabilitation were 10 percent more likely to return to work than were clients who did not participate in the program. The effect was statistically significant (t-statistic = 3.28).

### **1.2 Canadian Workers' Compensation Vocational Rehabilitation**

Another significant Canadian study is Allingham and Hyatt's (1995) study of the impact of vocational rehabilitation on the probability of post-injury return to work under Ontario's worker's compensation system. They merged data from the administrative files from the workers' compensation system (containing information on vocational rehabilitation interventions, nature of injury, permanent disability rating) with survey data from the Survey of Ontario Workers with Permanent Impairments conducted in 1989 and 1990 (containing descriptive information). The sample consisted of 6,613 workers of whom about half participated in vocational rehabilitation. Of those who participated in vocational rehabilitation 30.3 percent returned to work, compared to 90.6 percent among those who did not participate.

Allingham and Hyatt estimated a logistic regression on the probability of returning to work with a dummy independent variable for having taken vocational rehabilitation in addition to a set of control variables (age, gender, language, marital status, education, training, experience, earnings and occupation) including a variable indicating the individual's disability rating (from 1-100%). They also interacted the vocational rehabilitation variable with the disability rating schedule to see if taking participation in vocational rehabilitation mitigates the negative effect of a higher disability rating on the return to work decision. They found that vocational rehabilitation is associated with a large and significant negative effect on the return to work decision even after controlling for the effect of other variables that influence that decision. They do not interpret this as indicating that vocational rehabilitation *causes* a reduced probability of returning to work, but rather that "participation in a vocational rehabilitation program is simply a signal that the individual has been chronically unable to return to work since the injury occurred as a result of various possible barriers."<sup>22</sup>

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<sup>22</sup> Allingham and Hyatt, "Measuring the impact of vocational rehabilitation on the probability of post-injury return to work", *Research in Workers' Compensation*, ed. Terry Thomason and Richard Chaykowski (Kingston: Queen's University, 1995) p.171.

Based on the interaction term between vocational rehabilitation and the disability rating, they find that the disability rating itself has the expected negative impact on returning to work, but that this negative effect is reduced or mitigated for those who take vocational rehabilitation. This leads them to conclude: “Thus, it appears that vocational rehabilitation is having the intended effect – it is reducing the negative effect of residual disabilities on the return to work of injured workers.”<sup>23</sup>

They then tried to control for the endogeneity of vocational rehabilitation – that is, for the possibility that persons who are likely to have more trouble returning to work are also likely to participate in vocational rehabilitation. They did this by estimating a logit model for the probability of taking vocational rehabilitation as a function of all of the variables in the return to work equation as well as a set of variables for different experience rating possibilities which they did not include in the return to work equation but included in the equation on the probability of taking vocational rehabilitation so as help identify that equation. In doing so, they were faced with the conventional problem of finding variables that enter the selection equation, i.e., predicts well the probability of taking vocational rehabilitation but that do not influence the outcome equation (the probability of returning to work). They admit that their exclusion restriction (involving the exclusion of experience rating from the return to work equation) is unsatisfactory since employers with experience rating may have an incentive to expedite the return to work of their injured workers. Subject to those qualifications, they then added the fitted values of the linear probability equation to the equation on the probability of returning to work as a way to control for the possibility of the endogeneity of taking vocational rehabilitation. They find that their earlier results held up – that is, vocational rehabilitation seemed to have a substantially negative effect on the probability of returning to work. As well, while vocational rehabilitation mitigated the negative effect of having a higher disability rating, this mitigating effect was smaller after attempting to control for the endogeneity of vocational rehabilitation.

Overall, their results suggest that:

- Vocational rehabilitation is associated with lower and not higher probabilities of returning to work, both with and without controlling for the effect of other factors that would influence the probability.
- This result, somewhat surprisingly, held up even after controlling for the possibility that those who take vocational rehabilitation have other unobservable characteristics that make it less likely they will return to work, and it is these characteristics and not vocational rehabilitation that inhibit their return to work.
- Vocational rehabilitation did, however, mitigate the negative consequences of a higher disability rating. That is, higher disability ratings reduced the probability of returning to work, but this negative effect of the disability was smaller for those who took vocational rehabilitation.

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<sup>23</sup> Allingham and Hyatt, p. 171.



## 2. U.S. Studies

### 2.1 U.S. Workers' Compensation Vocational Rehabilitation

Gardner (1988) used probit models to estimate the impact of *different* vocational rehabilitation programs (school, training, job modification, counselling, and placement) in Florida's workers' compensation system in 1985 for those who completed vocational rehabilitation. Since this analysis did not include data on persons who did not complete vocational rehabilitation, it was not able to compare the impact of vocational rehabilitation itself – only how vocational rehabilitation completion, return to work and earnings recovery varied by the different types of vocational rehabilitation interventions and how that in turn differed by such factors as age, gender and language. These results indicated considerable variation by these different factors. They also indicated that early vocational rehabilitation intervention (within six months after the injury) is a key determinant of improved vocational rehabilitation completion, return to work and earnings recovery.

### 2.2 U.S. General Vocational Rehabilitation

As indicated in Barnow (1996) “There have been few evaluations of the impact of vocational rehabilitation on earnings and employment because it is difficult to identify an appropriate group of untreated individuals to use as a comparison group.”<sup>24</sup> A study by the U.S. General Accounting Office (GAO) (1993) did find positive effects of vocational rehabilitation on earnings using dropouts as their comparison group. But they also found that the short-term benefits faded very quickly.

Skaburskis and Collignon (1991) utilized California data for the early 1970s and found that the more severely disabled workers were more likely to return to work and receive higher post-vocational rehabilitation earnings in part because they were more likely to receive vocational rehabilitation.

Dean and Dolan (1991a, b) highlighted that the crucial evaluation issue is to find a comparison group that did not receive vocational rehabilitation to compare to the treatment group who completed vocational rehabilitation where successful completion is defined as completing vocational rehabilitation and retaining employment for a period of sixty days after placement. The study argued that it is not feasible to use conventional secondary data sources such as the Current Population Survey (CPS) to obtain a comparison group of disabled persons who did not receive vocational rehabilitation because of its limited reporting on disability. As such, the study advocated for an “internal” comparison group that had some exposure to vocational rehabilitation but did not complete it. Three possibilities were identified: (1) *rejected* applicants, (2) *unsuccessful* clients who were not successfully rehabilitated after receiving services, and (3) *dropouts* who were accepted and agreed to participate but who dropped-out.

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<sup>24</sup> Barnow, “Policies for people with disabilities in U.S. employment and training programs”, *Disability, Work and Cash Benefits*, ed. J.Mashaw, V. Reno, R. Burkhauser and M. Berkowitz (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1996) p. 301.

The study highlighted selection problems associated with each of these comparison groups. Rejected applicants, because of self-selection and screening, obviously may differ from the treatment group in terms of unobservable characteristics that are difficult to control for in the statistical analysis. Unsuccessful rehabilitants suffer from a contamination bias since they have been exposed to the vocational rehabilitation that should be reserved for the treatment group. Dropouts also may differ from the treatment group in unobserved characteristics, but this may be minimized by the fact that they had the motivation to apply and meet the pre-screening eligibility requirements. Furthermore, dropouts, for example, may be less motivated (which is why they may drop-out) but they may be more ambitious, seeking to obtain employment on their own. Overall, the study concluded that dropouts are the preferred comparison group, relative to the other options.

Hayward and Schmidt-Davis (2002) also used dropouts as a comparison group in their tabulations of vocational rehabilitation outcomes for those who received vocational rehabilitation services, based on longitudinal data where vocational rehabilitation participants were tracked for up to three years after receipt of vocational rehabilitation services.

Dean and Dolan (1991a, b) linked vocational rehabilitation data and earnings data from Virginia to create a longitudinal file for the period 1976-85. Pre-program earnings (two years prior to application) were compared with post-program earnings (one year after completion) for vocational rehabilitation treatment recipients with the drop-out comparison group, for six gender-disability stratifications. The treatment group, “service-receiving clients”<sup>25</sup>, was defined as “successfully and unsuccessfully rehabilitated clients”<sup>26</sup>. It also included clients who were not successfully rehabilitated after receiving services. Positive earnings effects ranging from \$310 to \$1632 were identified; however they were statistically significant in only half of the model specifications. Selection bias was a concern noted by the authors.

### **2.3 U.S. Social Security Disability Insurance – Vocational Rehabilitation**

Earlier studies of the U.S. Social Security Disability Insurance program (U.S. General Accounting Office 1987, 1994) found that vocational rehabilitation had little or no effect on fostering return to work and reducing the disability rolls. The GAO (1994) study, for example, concluded that “rehabilitation contributes little to terminations.”<sup>27</sup> In surveying that earlier literature, Berkowitz and Dean (1996) concluded: “The bulk of the empirical evidence reinforces the maxim that once on the rolls, people tend to stay on them.”<sup>28</sup> In 1992, for example, less than 0.2 percent returned to work after receiving vocational rehabilitation.

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<sup>25</sup> Dolan and Dean, “Fixed effects estimates of earning impacts for the vocational rehabilitation program”, *Journal of Human Resources*, 26 (Spring 1991a) p. 387.

<sup>26</sup> Dolan and Dean, 1991a, p. 384.

<sup>27</sup> U.S. General Accounting Office. “Social security disability roles keep growing, while explanations remain elusive” (Washington, D.C.: Government Printing Office, 1994) p.19.

<sup>28</sup> Berkowitz and Dean, “Lessons from vocational rehabilitation/social security administration experience”, *Disability, Work and Cash Benefits*, ed. ed. J.Mashaw, V. Reno, R. Burkhauser and M. Berkowitz (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1996) p. 240.

Similar small numbers were reported by Berkowitz (1996)<sup>29</sup>. Vocational rehabilitation counsellors indicated that vocational rehabilitation efforts were unsuccessful because there was little monetary incentive to return to work and lose disability and medical benefits, and disabilities were often so severe that vocational rehabilitation was not feasible.

Berkowitz and Dean (1996) indicate that “Because it is so much harder to rehabilitate Disability Insurance (DI) cases, vocational rehabilitation counsellors tend to shy away from them.”<sup>30</sup> Hennessey and Muller (1994) also reported that few beneficiaries even attempted to return to work and of those who did, only a small proportion were able to return to self-supporting employment. The beneficiaries also tended to report vocational rehabilitation as having had some, but only a limited, impact on their ability to return to work. In a more recent study, however, Hennessey and Muller (1995) used hazard estimates of duration analysis and found that vocational rehabilitation services (physical therapy, vocational training, general education and job placement) did facilitate the return to work, although job counselling had no impact.

## **2.4 U.S. Cost-Benefit General Vocational Rehabilitation**

Conley (1965, 1969) estimated an average benefit/cost ratio of 5/1, i.e., \$5 in post-vocational rehabilitation earnings for every \$1 spent, based on U.S. national data of the state-federal vocational rehabilitation program which served over 170,000 disabled clients in 1967. The gains were higher for the uneducated, middle-aged, and the severely disabled.

Bellante (1974) criticized Conley’s studies on the grounds that they did not use multivariate analysis to control for other factors that could have affected the outcomes. Bellante then used multivariate methods to estimate benefit/cost ratios for Florida’s vocational rehabilitation program in 1969. From administrative data, benefits were calculated as the difference in earnings after VR less earnings when the person entered vocational rehabilitation, capitalised over the work life of the client. Costs were defined as vocational rehabilitation service costs plus overhead costs. Benefit/cost ratios ranged from approximately 2/1 to 40/1, the larger payback observed for younger clients, males, more educated clients, and urban dwellers – what Bellante labelled as the more high-productivity groups.

Worrall (1978) replicated Bellante’s analysis on national data and observed results that are closer to Conley’s earlier results. He calculated benefit/cost ratios for 180 groups and found only eight of them that had ratios of less than one, with seven of those eight being for older persons over age 54. He identified, however, the limitation of their analysis of not utilizing comparisons groups: “Establishment of a control group or some reasonable proxy measure for such a group would greatly improve benefit-cost estimates by allowing us to obtain better estimates of actual earnings gain due to the program.”<sup>31</sup>

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<sup>29</sup> Berkowitz, “Improving the return to work of social security disability beneficiaries”, *Disability, Work and Cash Benefits*, ed. ed. J.Mashaw, V. Reno, R. Burkhauser and M. Berkowitz (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1996) p. 333.

<sup>30</sup> Berkowitz and Dean, p. 239.

<sup>31</sup> Worrall, “A benefit-cost analysis of the vocational rehabilitation program”, *Journal of Human Resources*, 13 (Spring 1978) p. 295.

Berkowitz (1988) also discussed earlier estimates of benefit/cost ratios of around 35/1 and 10/1 from the Office of Vocational Rehabilitation. These ratios were obtained by estimating the total post-vocational rehabilitation earnings of clients who obtained employment after receiving vocational rehabilitation.

Dean, Dolan and Schmidt (1999) utilized a U.S. panel data set that linked vocational rehabilitation data for clients who left vocational rehabilitation in 1980 to earnings history data from 1972-1988. They used program dropouts as their comparison group to estimate the impact of vocational rehabilitation on earnings as a measure of the benefits of the program. They then calculated benefit/cost ratios averaging around 2.5/1 indicating that vocational rehabilitation yielded approximately \$2.50 of additional earnings for every dollar spent on vocational rehabilitation. These ratios varied considerably across different groups and disabilities.

## **2.5 U.S. Social Security Disability Insurance – Vocational Rehabilitation Cost Benefit**

Very different benefit/cost ratios were estimated for the Beneficiary Rehabilitation Program of the U.S. Social Security Disability system. Berkowitz et al. (1982) reviewed four earlier studies conducted in the 1970s by the Social Security Administration. Those studies calculated the benefits of vocational rehabilitation as the savings to the system from the reduced benefit payouts for persons who left the system after vocational rehabilitation, with the costs being the operating cost of the vocational rehabilitation component. Those calculations yielded benefit/cost ratios ranging from 1.15/1 to 2.50/1. Their own study<sup>32</sup> yielded a benefit cost ratio of 1.17/1 for 1973. McManus (1981), utilizing the benefit/cost methodology more explicitly, made some more refined calculations, identified ratios of 1.39/1 to 2.72/1 in 1975.

## **3. Other Studies**

### **3.1 Australian Commonwealth Rehabilitation Services**

In an evaluation of the rehabilitation services provided to people with a disability in Australia by the Federal Commonwealth Rehabilitation Services, a comprehensive cost benefit analysis yielded an estimated benefit/cost ratio of 30.33/1. The authors identified social benefits as the sum of private benefits (value of working life income premium) and public benefits (tax revenues and savings in terms of benefit payments). Total costs include primarily the costs of delivering the program.

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<sup>32</sup> Berkowitz et al. "An economic evaluation of the beneficiary rehabilitation program", *Alternatives in Rehabilitating the Handicapped*, ed. J. Rubin and V. Laporte (New York: Human Sciences Press, 1982) p.23.

## *Appendix C: Client Characteristics and Outcomes*

**Table 2 – Logit Regression Coefficients and p-values**

	Completed CPPD VR		Off CPPD Benefits		Obtained Employment		Obtained Substantially Gainful Employment	
Variable	coef.	p-value	coef.	p-value	coef.	p-value	coef.	p-value
Mean Dep. Var.	0.484	n.a.	0.290	n.a.	0.774	n.a.	0.721	n.a.
AgeDisabled	0.033	0.154	-0.038	0.000	-0.014	0.178	-0.013	0.192
Married	0.238	0.639	-0.081	0.594	-0.332	0.311	-0.302	0.315
Male	0.762	0.164	-0.247	0.082	-0.405	0.189	-0.325	0.255
Married x Male	-0.348	0.609	0.474	0.014	0.415	0.298	0.313	0.396
Number Children	-0.046	0.731	-0.091	0.024	-0.092	0.273	-0.103	0.177
(OtherEducation)								
HighSchool	0.347	0.468	0.194	0.11	-0.066	0.788	0.105	0.750
CollegeDiploma	-0.006	0.993	0.283	0.101	0.189	0.600	-0.237	0.254
Univ.Diploma	-0.130	0.845	0.338	0.047	-0.960	0.001	-0.840	0.003
Educat. Missing	--	--	0.650	0.000	0.410	0.074	0.233	0.257
Infection	22.082	0.000	1.050	0.019	0.543	0.499	0.421	0.436
Neoplasm	22.260	0.000	1.132	0.002	0.274	0.691	-0.749	0.325
(Endocrine)								
Blood	--	--	--	--	--	--	--	--
Mental	21.905	0.000	-0.526	0.130	0.198	0.771	-0.167	0.579
Nervous system	21.306	0.000	-0.370	0.315	0.411	0.574	0.164	0.676
Circulatory	21.657	0.000	0.244	0.498	0.528	0.450	0.096	0.776
Respiratory	20.068	0.000	-0.009	0.985	-0.539	0.561	-0.633	0.366
Digestive	22.903	0.000	0.338	0.424	-0.057	0.942	-0.450	0.343
Genitourinary	22.358	0.000	1.143	0.009	0.205	0.791	-0.080	0.864
Pregnancy comp	--	--	--	--	--	--	--	--
Skin&tissue	--	--	-0.764	0.503	--	--	--	--
Musculoskeletal	21.494	0.000	-0.119	0.731	0.574	0.396	0.082	0.779
Congenital	21.182	0.000	0.905	0.109	1.256	0.314	0.389	0.643
Perinatal	--	--	--	--	--	--	--	--
Symptoms	--	--	-0.021	0.969	1.162	0.359	0.191	0.828
Radiology	--	--	--	--	--	--	--	--
Ill defined	--	--	0.485	0.625	--	--	--	--
Injury/poison	21.882	0.000	0.127	0.725	0.863	0.233	0.403	0.275

Comorbid2	-0.686	0.078	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Comorbid3	1.238	0.111	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
PriorVR	1.331	0.095	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

VRCompleted	n.a.	n.a.	2.543	0.000	1.255	0.002	0.665	0.037
VRExpenditure	0.000	0.000	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

<b>Sample size</b>	<b>220</b>	<b>2,773</b>	<b>754</b>	<b>754</b>
<b>Pseudo-RSquare</b>	<b>0.165</b>	<b>0.104</b>	<b>0.055</b>	<b>0.037</b>

Note: ( ) denotes omitted reference category in cases where not obvious, n.a. denotes not applicable,

-- denotes coefficient not estimated since no observations in that category.

# *Appendix D: Summary of Gross Cost Savings Results*

**Table 3 – Cost Savings Due to Post-CPP Disability VR Employment and Substantially Gainful Employment**

Comparison Group	Obtained Employment	Obtained Substantially Gainful Employment
<b>Cost Savings -- No Controls (Simple Averages)</b>		
Tight (dropouts)	\$5,022.12*	\$3,971.46*
Broad (dropouts + flagged at application + reassessed any reason)	-\$3,415.08	-\$2,215.90
<b>Cost Savings -- Controls for Observables (OLS Regression)</b>		
Tight (dropouts)	\$7,071***	\$5,055
Intermediate (flagged at application)	\$6,425***	\$5,435***
Broad (dropouts + flagged at application + reassessed any reason)	\$32	-\$1,212
<b>Cost Savings -- Controls for Unobservables (Heckman Selection)</b>		
Tight (dropouts)	\$14,704	\$20,368
Intermediate (flagged at application)	\$3,760	\$4,236
Broad (dropouts + flagged at application + reassessed any reason)	-\$57	-\$561
<b>Cost Savings -- Propensity Score Matching</b>		
Tight (dropouts)	\$16,373***	\$16,526***
Intermediate (flagged at application)	\$2,961	\$5,883***
Broad (dropouts + flagged at application + reassessed any reason)	-\$344	-\$1,993

Note: Statistical significance is denoted by \*\*\* and \* respectively at the 0.01 and 0.10 levels.