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## Medicaid Infrastructure Grant: The Impact of Benefits Counseling and Vocational Rehabilitation on Earnings

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## I. Introduction

Nearly one in five Americans—19 percent—are classified as having a disability (U.S. Census Bureau, 2009), 12 percent of Americans have a severe disability (Brault, 2008), and 21 million families have a member with a disability. These include people of all ages who need assistance with everyday activities due to difficulty hearing or seeing, physical limitations, or difficulty with cognitive, mental, or emotional functioning. People with disabilities are more likely than people without disabilities to have zero or very low incomes. The most recent available Census data indicate that in 2005, median monthly earnings were \$1,458 for people with a severe disability, \$2,250 for people with a non-severe disability, and \$2,539 for those with no disability (U.S. Census Bureau, 2009).

Although legislative mandates and growth in the disability rights movement in the past two decades have resulted in some improvements, the successful employment of people with disabilities remains a crucial policy issue. Approximately 54 million Americans have some mental or physical impairment (U.S. Census Bureau, 2000). In 2002, 33 million had a severe disability and 10 million individuals needed assistance in their daily lives (Steinmetz, 2006). Among the population 15 and older, approximately 3 million people use a wheelchair and another 9 million use some type of ambulatory aid, such as a cane or walker (Steinmetz, 2006). People with disabilities also include those with less visible conditions, such as cancer, epilepsy, and heart disease (Kennedy & Harris, 2003). While there are varying definitions of disability, the most commonly used is a three-part definition that reflects types of discrimination that people with disabilities often experience (National Institute on Disability and Rehabilitation Research, 2007). Under the Americans with Disabilities Act (ADA), an individual with a disability is one who: 1) Has a physical or mental impairment that substantially limits one or more major life activities, 2) Has a record of such an impairment, or 3) Is regarded as having such an impairment (National Institute on Disability and Rehabilitation Research, 2007).

People with disabilities constitute approximately 17 percent of all working-age Americans (Kennedy & Harris, 2003). In 2006, the U.S. employment rate of working-age people with disabilities was 38 percent compared to 80 percent for working-age people without disabilities (Rehabilitation Research and Training Center on Disability Demographics and Statistics, 2007). In the same year, the percentage of working-age people with disabilities working full-time/full-year was 22 percent compared to 57 percent of people without disabilities. Nine percent of people with disabilities were not working but actively seeking employment compared to 20 percent of people without disabilities (Rehabilitation Research and Training Center on Disability Demographics and Statistics, 2007). The employment of people with disabilities has economic benefits and serves as an important route to social inclusion (Evans & Repper, 2000; Schur, 2002); many people with disabilities who are not working experience discrimination and economic, educational and vocational disadvantages (Beverly & Alvarez, 2003). Findings from the National Organization on Disability (2004) show corresponding differences between people with disabilities and their counterparts in education, health care, transportation, entertainment, socialization, political participation, life satisfaction, and optimism for the future. For example, people with disabilities are twice as likely as those without disabilities to have inadequate transportation (31% versus 13%), and only 34 percent report being very satisfied with their lives compared to 61 percent of those without disabilities (National Organization on Disability, 2004).

According to National Organization on Disability President Alan Reich, while there have been some improvements, “progress is too slow, and the gaps are still too large [and] people with disabilities remain pervasively disadvantaged” (National Organization on Disability, 2004).

For people with disabilities who are not working, lack of income from wages and access to employer sponsored health coverage are paramount among the disadvantages they experience (National Organization on Disability, 2004). Without income or health coverage, the poverty rate for working-age people with disabilities in 2006 was reported to be 25 percent (Rehabilitation Research and Training Center on Disability Demographics and Statistics, 2007). According to Kennedy and Harris (2003), the unemployment, underemployment, and poverty that this group of people experience are partly “attributable to a denial of basic civil rights to individuals with disabilities” (p. 81). Even though there has been progress in rehabilitation efforts, a majority of people with disabilities in the U.S. between the ages of 16 and 64 remain unemployed; this disparity has not changed since 1986 even though most unemployed people with disabilities in the working age population want to be employed (Kosciulek, 2004).

Low employment rates among people with disabilities are due to multiple factors including lower levels of education and work experience, disability-related work restrictions, employer discrimination, lack of on-the-job support services, and difficulties maintaining employment following the onset of a disability. Data from the Disability Supplement of the National Health Interview Survey (NHIS-D) indicate that the most common barriers encountered by non-working people with disabilities who want to work include: no appropriate jobs available (52%), family responsibilities (34%), lack of transportation (29%), no appropriate information about jobs (23%), inadequate training (22%), fear of losing health insurance/Medicaid (20%), and discouragement by family/ friends (14%) (Loprest & Maag, 2001). In an initiative to examine employer practices related to the employment provisions of Title I of the American with Disabilities Act and other civil rights legislation, lack of experience and lack of required skills/training were viewed as the greatest barrier to the employment of people with disabilities by both public and private sector employers (Bruyère, 2000).

Another reason for low employment rates among people with disabilities relates to accommodations. NHIS-D results demonstrate that one-third of people with disabilities were unable to work because they lacked necessary accommodations. Some of the accommodations that were lacking included: accessible parking or public transit stop nearby (19%), need for an elevator (17%), adaptations to work station (15%), and other accommodations such as a reduction in work hours (12%) (Loprest & Maag, 2001).

To more fully integrate people with disabilities into employment, improvements in education and training are needed. In addition, increased employer outreach to recruit people with disabilities and a better knowledge of reasonable accommodations are crucial to change unfavorable attitudes that preclude people with disabilities from employment (Bruyère, 2000).

## **II. Literature Review**

### **A. Federal legislation to improve the employment rates of people with disabilities**

Within the past twenty-five years, U.S. government initiatives have been implemented to protect people with disabilities from employment discrimination and authorize accommodation for them in the workplace (Kennedy & Harris, 2003). The Rehabilitation Act of 1973 was the first major legislation that sought to improve employment rates for people with disabilities by prohibiting discrimination on the basis of disability in federal employment, federal programs, and in other programs receiving federal government assistance (Rehabilitation Act of 1973, Public Law 93-112).

In 1998, President Clinton established the Presidential Task Force on Employment of Adults with Disabilities (PTFEAD). Its mandate was to increase employment rates among people with disabilities to at least approximate the rate of employment of the general public (President Clinton, 1998). The task force comprised cabinet-level members including the secretaries of Treasury, Commerce, Transportation, Health and Human Services, Veteran's Affairs; administrators of Social Security; and chairmen of the National Council on Disability and the Equal Employment Opportunity Commission (President Clinton, 1998). The work of the task force was expanded in 2000 to include studying how to improve employment outcomes for people with disabilities by focusing on education, transition, employment, health and rehabilitation, and independent living issues impacting young people with disabilities (President Clinton, 2000). Recommendations in the PTFEAD reports were instrumental in the passage of legislation that removed barriers and afforded opportunities for individuals with disabilities. Among the legislative components were the Ticket to Work and Work Incentives Improvement Act of 1999.

An additional piece of the PTFEAD included funding of Rehabilitation Research and Training Centers (RRTC's) by the National Institute on Disability and Rehabilitation Research (NIDRR). Operated in collaboration with institutions of higher education or rehabilitation providers, these training centers serve to enhance knowledge and information which would continue to support current and future policies regarding rehabilitation methodology and service delivery programs and support the social and economic independence of individuals with disabilities.

The Workforce Investment Act was signed into law in August 1998 by President Clinton and represented an effort to consolidate several federally-funded programs into three State block grants including Adult Employment and Training, Disadvantaged Youth Employment and Training, and Adult Education and Family Literacy. Under these grants, one-stop centers or Workforce Development Centers were established to provide job seekers with a wide range of services that had previously been provided by multiple individual agencies (President Clinton, 1998). A major part of this legislation includes the Rehabilitation Act Amendments of 1998 which continue vocational rehabilitation as a separate State agency, provide for an Individual Plan of Employment (IPE) to replace the Individual Written Rehabilitation Plan (IWRP) for eligible individuals, presume eligibility for people receiving Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI), and a requirement that all eligible people receive information and referral services to the State Workforce Development System to assist them in finding and retaining employment (President Clinton, 1998).

Twelve separate demonstration projects were funded by the Social Security Administration for the development of creative new ways for assisting people with disabilities in their attempts to gain meaningful employment. In addition, the Ticket to Work and Work Incentives Improvement Act (1999) is a national initiative allowing any person receiving SSI or SSDI to receive a "ticket" for vocational rehabilitation and any other employment supports from a series of employment networks. Some of these networks can include state rehabilitation agencies in addition to the one-stop centers. This legislation is designed to enhance a person's decision about going to work by eliminating the possible loss of health care coverage and increasing consumer control regarding the delivery of employment services and supports. Also associated with this bill is the removal of disincentives related to having to choose between work and health care coverage and providing a mechanism for reinstatement of benefits should the individual not be able to continue working (Centers for Medicaid and Medicare, 2008).

In 2001, Congress approved an Office of Disability Employment Policy (ODEP) to be headed by an Assistant Secretary. ODEP is currently a Federal agency in the Department of Labor. Its mission is to provide national leadership to increase employment opportunities for adults and youth with disabilities while making efforts to eliminate employment barriers (U.S. Department of Labor, 2008)

On January 10, 2001, President Clinton issued an Executive Order establishing the President's Disability Employment Partnership Board. Members of this group provide advice and information on facilitating the employment of people with disabilities and assist in other activities promoting the formation of public-private partnerships, use of economic incentives, provision of technical assistance regarding entrepreneurship, and other actions that may enhance employment opportunities for this population (President Clinton, 2001).

The New Freedom Initiative was announced by President Bush in February 2001. This initiative carries forward the spirit and expands the goals of the former PTFEAD and is a comprehensive nationwide effort to ensure that all Americans have the opportunity to learn and develop skills, participate in productive employment, and make personal choices about their daily lives. The New Freedom initiative helps people with disabilities increase access to new technologies that help them participate more fully in society, expand their educational opportunities, better integrate them into the workforce, expand transportation alternatives, and promote their full access to community life (President Bush, 2001).

As part of the New Freedom initiative, President Bush issued an Executive Order, "Community-Based Alternatives for Individuals with Disabilities," on June 19, 2001. This Order directs six federal agencies, including the departments of Justice, Health and Human Services, Education, Labor, and Housing and Urban Development, and the Social Security Administration to "evaluate the policies, programs, statutes and regulations of their respective agencies to determine whether any should be revised or modified to improve the availability of community-based services for qualified individuals with disabilities" and to report back to the President with their findings (President Bush, 2001). Although not named in the Executive Order, the departments of Transportation and Veterans Affairs, the Small Business Administration, and the Office of Personnel Management participated in the implementation effort (President Bush, 2001). On March 25, 2002, the Interagency Council on Community Living presented President Bush with *Delivering on the Promise: Compilation of Individual Federal Agency Reports of Actions to Eliminate Barriers and Promote Community Integration*, a compilation of reports from participating federal agencies.

## **B. Benefits counseling**

The extensive and complex post-entitlement rules and work incentives necessitated the creation of a highly trained group of benefits specialists whose job it is to explain to beneficiaries the rules governing their entry into employment ranks and the impact of this employment on cash and medical benefits. This counseling is a response to the increasing concerns of many Social Security Administration (SSA) disability beneficiaries regarding the impact of employment on their benefits (Tremblay, Smith, Xie, & Drake, 2006). Rising concerns as well as misunderstandings about benefits resulted from SSA's launching of state initiatives that focused on the removal of employment barriers for beneficiaries and recipients and in expectation of the passage of Ticket to Work and Work Incentives Improvement Act of 1999 (Golden, O'Mara, Ferrell, & Sheldon, 2000).

Given that SSA rules for Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) are complex and difficult to comprehend, benefits counseling is intended to provide information on both state and federal benefits to beneficiaries and other supportive professionals. This counseling is a unique form of financial planning that is personalized, longitudinal, and varies in intensity depending on the needs of the beneficiary (Tremblay et al., 2006). Benefits counseling is provided by practitioners who have expertise in issues related to benefits planning and support and represent numerous fields including rehabilitation counselors, insurance rehabilitation specialists, transition planners, supported employment personnel, vocational evaluators, Community Work Incentive Coordinators, and advocates and peer counselors (Golden et al., 2000; National Council on Disability, 2005). These specialists are equipped to provide counseling services to beneficiaries that focus on education about SSA disability programs and work incentives and/or benefits they are eligible for under different programs. Explanation is typically provided to beneficiaries to help them understand trial work periods, how benefits and earnings are affected by employment activity, and what other benefits, such as vocational rehabilitation, are available and how they can access additional support. Further the information is advantageous in assisting in benefits analysis and providing an assessment of potential employment ramifications that could impact the overall finances of the beneficiaries (National Council on Disability, 2005).

Despite the critical role filled by benefits counselors, there is a dearth of outcome evaluation studies documenting the impact on earnings. However, two studies do fill a gap in the literature. One study compared beneficiaries who received specialized benefits counseling to matched contemporaneous and historical controls; results showed that participants who received specialized benefits counseling achieved significantly greater improvements in earnings than the two comparison groups (Tremblay et al., 2006). This trend continued for eight consecutive quarters post intervention. The second study examined a pool of SSDI beneficiaries who had access to benefits counseling. Individuals who opted for benefits counseling were compared to those who did not select the service. Results indicate strong improvement in employment outcomes for earnings, and somewhat less for the probability of employment (Sell, Hartman & Delin, 2009).

## **C. Vocational rehabilitation**

Vocational rehabilitation (VR) initially emerged in response to a growing need for improved vocational assessment and to facilitate the determination of a client's vocational potential (Hamilton & Shumate, 2005). Since then, major changes in service delivery systems and federal legislative mandates (i.e., Rehabilitation Act Amendments of 1998; Ticket to Work

and Work Incentives Improvement Act of 2002) have influenced the evolving practice of vocational rehabilitation (Young, 2001) and continue to underscore its primary goal of helping people with disabilities find employment (Capella, 2003).

Vocational rehabilitation services are located in various sectors including the public sector (e.g., state VR agencies), private not-for profit sector (e.g., Goodwill Industries), and private-for profit sector (e.g., insurance-based rehabilitation) (Pruett, Swett, Fong, Rosenthal, & Lee, 2008). In all divisions, VR counselors are required to provide people with disabilities assessment counseling, job development and placement opportunities, and case management services as needed (Pruett et al., 2008). The current practice of VR focuses on the inclusion, autonomy, and empowerment of individuals with disabilities and is a highly creative and individualized process that helps them develop career plans, learn job skills, obtain and retain a job, obtain medical insurance and engage in a fulfilling career (Mullins, Roessler, Schriener, Brown & Bellini, 1997; Pruet et al., 2008; Wehman, Revell, & Brooke, 2003).

Given that work is a fundamental force in people's lives, elevated rates of unemployment and underemployment have the potential to negatively impact the social interactions and self-esteem of people with disabilities (Kosciulek, 2004). Further, limited early social and vocational experiences as well as decreased societal expectations are difficult barriers for people with disabilities to overcome by themselves. Central to the delivery of effective VR services is a strong consumer-counselor alliance and skills training that have the potential for positive outcomes including greater consumer choice, self-determination and empowerment (Wehmeyer, 2004; Power, 2006, Tigges, 2004).

Person-centered planning is a more recent approach utilized in VR that is useful in assisting people with disabilities of different cultural, ethnic, and linguistic backgrounds (Hasnain & Sotnik, 2003). Given the increasing diversity in today's population, this approach is a culturally responsive strategy to help people with disabilities experience positive results in career planning programs (Hasnain & Sotnik, 2003). While it's becoming easier for people with disabilities to find VR support, states continue to revise related practices to promote employment opportunities for and the inclusion of people with disabilities in the workplace (Young, 2001).

#### **D. The relationship between benefits counseling, vocational rehabilitation, and employment/earnings**

There is some evidence that benefits counseling and vocational rehabilitation services have enhanced the employment opportunities and earnings of people with disabilities (Wehman et al., 2003). In one study, benefits counseling was associated with significant increases in the average earnings of Social Security disability beneficiaries after controlling for preexisting earnings advantages and major demographic predictors of earnings (e.g., age, sex, Social Security beneficiary type) (Tremblay et al., 2006). In the same study, researchers found that, as an employment intervention, benefits counseling, defined as "a supplementary service designed to enhance vocational rehabilitation," may improve earnings more than what can be attributed to vocational rehabilitation services because consumers were better informed about employment benefits and work incentives than those in the study's comparison groups (Tremblay et al., 2006, p. 820). Similarly, in analyzing pre-enrollment and post-enrollment quarterly earnings, Vermont's Division of Vocational Rehabilitation found that benefits counseling improves employment outcomes and economic circumstances for even the most vulnerable consumers (Smith & Porter, 2004). Data show that in the year following benefits counseling enrollment, participants brought in \$800,000 in additional earnings and raised their employment rate from 35% to 50% (Smith & Porter, 2004).

In comparing the differences in earnings among three populations including those who had VR, Capella (2003) found the earnings of people in the VR group to be similar to the lowest paid in the general labor force. The greatest percentage in the general labor force were employed in Managerial, Professional, Paraprofessional, and Technical areas whereas the greatest percentage of workers from VR consumer groups in the study were employed in Service type occupations (Capella, 2003).

A different study examining long-term outcomes for SSA beneficiaries who participated in VR found that while earnings increased for many beneficiaries after completing VR services, very few earned enough to leave the SSA programs and approximately one-quarter who left returned (GAO, 2007). Data from the report show that the average annual earned income for all beneficiaries leaving SSA for the 2000-2001 exit cohorts was \$12,027. This compares to the median annualized substantial gainful activity (SGA) income of \$9,618, the average annualized disability benefit of \$8,460 for Disability Insurance (DI) beneficiaries, and \$4,452 for the SSI recipients in the year following VR (GAO, 2007).

While there is evidence that benefits counseling and vocational rehabilitation programs have improved the employment opportunities and earnings of people with disabilities, these services are still largely hidden from businesses (Wehman, 2003). As a result, employers don't know how or where to recruit people with disabilities and this significantly reduces job opportunities and related earnings for this group of people. Regardless of how effective benefits counseling and vocational rehabilitation are on an individual basis, the more global reality is that in order for people with disabilities to experience a wider range of job opportunities and higher wages, it is necessary to evaluate quality indicators in both benefit counseling and vocational rehabilitation programs. Wehman et al. (2003) suggests programs should evaluate their ability to provide community outreach and disability awareness, liaisons between people with disabilities and businesses, and most importantly should have a "sense of urgency that is responsive to the business community" (p. 172). Such assessments would not only strengthen programs but have greater potential to benefit the employment and earnings outcomes of people with disabilities who want to work.

## **E. Purpose Statement**

The purpose of this report is to examine the relationship between benefits counseling, vocational rehabilitation, employment and earnings of people with disabilities. Based on a comprehensive analysis of quarterly employment and earnings data dating back to 2002, the primary focus of this review is on the following:

- Evidence of the effectiveness of BRS programs in promoting employment of people with disabilities as evidenced by change in post earnings following intervention;
- Factors that potentially inhibit the effectiveness of BRS programs in promoting the employment of people with disabilities as evidenced by change in post earnings following intervention.

### **III. Sample Selection and Analysis**

#### **A. Sample Selection**

The analytic database began with a series of person level files. Upon merging and cleaning the files we had 8,031 unique individuals in the database. All of these people were either on SSI or SSDI at the time of the data capture and had received or were receiving benefits counseling and/or vocational rehabilitation in the state of Connecticut sometime between January 1, 2002 and June 30, 2008.

##### **1. Vocational rehabilitation (VR) and benefits counseling (BC) status and enrollment**

The primary sample selection was drawn from participants in the vocational rehabilitation and benefits counseling programs. The sample was categorized in several different ways. First, we identified an intervention ordering: VR only, BC only, VR before BC, and BC before VR. Preliminary analyses demonstrated that the ordering of BC and VR had a minimal impact on the outcomes of interest, so we combined both into one group and referred to this new group as BC/VR. Next we calculated days of intervention (days enrolled in a VR program), which was further subdivided into quarters and years. Note that censoring occurred, as a number of individuals were actively engaged in the VR program at the close of the data capture ( $n=2,356$ ). We selected only cases that had been closed for at least eight quarters for this analysis ( $N=5,675$ ).

Individuals included in the database could have enrolled in VR or BC in any quarter between January 1, 2002 and June 30, 2008. The length of intervention varied by person and was dependent on each individual's rehabilitation or counseling plan. The inclusion of rolling enrollment in the database affords the opportunity to include 100% of all participants; however, it complicates data analysis as participants all have a unique intervention start date and end date.

The intervention period for individuals receiving VR was easy to ascertain; there is a defined start date and a defined end date that ranged anywhere from one day to 1,836 days (mean=461 days). The intervention date associated with BC was a bit more complex; while most encounters involved one session only, the period of intervention could have included several follow-up contacts. As a result, for the group who received benefits counseling only, the quarter that the counseling session occurred was considered the intervention period and was excluded from quarterly analysis; the two pre-quarters occurred prior to the intervention and first post-quarter began immediately after the quarter of intervention. For individuals who received both VR and BC, the vast majority of the interventions occurred concurrently (i.e., BC was received during the VR intervention), and the VR intervention was period was excluded from analysis. Finally, for the small number of individuals who received BC either before or after VR, both periods of intervention were excluded from the analysis.

## **2. Dependent variables**

We examined two dependent variables: employed (yes vs. no) at each quarter and average earnings at each quarter. Earnings data were drawn from the Department of Labor's unemployment insurance wage data file, and appeared in quarterly segments (quarter 1 of 2000 through quarter 2 of 2008). We converted all earnings information to 2007 dollars using the CPI general inflation calculator (annual amounts). We calculated work status/employment on a quarterly basis using non-zero earnings. We created a new variable so that a person's entire period of enrollment in VR was classified as null (also referred to as intervention). This held true whether the individual was in VR for 2 months or 2 years. We then looked at employment and earnings two quarters pre-intervention, and eight quarters post-intervention. To be classified as a positive earner, individuals had to earn at least \$1 in one of two pre-quarters, and at least \$1 in one of eight post-quarters.

## **3. Independent variables**

Five independent variables were identified for inclusion in the models. Age was treated as a continuous variable for the univariate analysis and then recoded into three categories (< 25, 25 to <50, 50+) for the multivariate modeling. Gender was dichotomized and included in all models. Enrollment in a Medicaid Buy-In program was coded 0=no, 1=yes; an individual was classified as "yes" if they were enrolled in a Medicaid Buy-In program at any time during the intervention. For ease of interpretation, number of days enrolled in vocational rehabilitation was divided into three categories: <6 months, 6 months to <1 year, 1 year +. Finally, primary disability type was gleaned from the Social Security database and individuals fell into one of six categories: blind/deaf, mobility/orthopedic, psychiatric/behavioral, cognitive/learning, respiratory/physical and other. Table 1 below provides a brief description of each disability category.

Table 1. Summary of Disability Categories

Disability type	Definition
Blind/ deaf	The term "deaf/blindness" is intended to encompass the disability of a severe hearing impairment (deaf or hard of hearing) and/or the disability of a severe visual impairment which causes extreme difficulty in attaining independence in daily life activities, achieving psychosocial adjustment, or obtaining a vocation.
Mobility/ orthopedic	<p>Most mobility limitations result from a broad range of neuromuscular and orthopedic disabilities that produce wide variations in the nature and extent of physical functions. The most common mobility disabilities are spinal cord injuries, cerebral palsy, multiple sclerosis, muscular dystrophy, post polio paralysis, spina bifida, and others that result in quadriplegia and paraplegia. Causes of mobility disorders are also due to physical conditions such as amputation of one or more limbs, arthritis, and back disorders.</p> <p>Orthopedic impairments affect the motion and motor skills that limit independence.</p>
Psychiatric/ behavioral	Psychiatric or behavioral disabilities are associated with a dysfunction of the brain resulting in an altered mental state and loss of previously acquired functional abilities. The disability requires loss of specific cognitive abilities or affective changes. Typical symptoms include: disorientation to time and place, memory impairment, perceptual or thinking disturbances (e.g., hallucinations, delusions), change in personality, disturbance in mood, or emotional lability.
Cognitive/ learning	<p>Cognitive disability hampers clear thoughts in the mind and provides reluctance to conceptualization. This disability exhibits problems in comprehending any new idea or opinion, or finding solutions to problems.</p> <p>Learning disability is defined as several disorders affecting the academics and normal functioning including problems reading, writing, learning, listening, speaking and organizing information.</p> <p>Intellectual disability also resides in this category and is a disability characterized by significant limitations both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behavior, which covers a range of everyday social and practical skills. This disability originates before the age of 18.</p>
Respiratory/ physical	<p>Impairments caused by chronic disorders of the respiratory system generally produce irreversible loss of pulmonary function due to ventilatory impairments, gas exchange abnormalities, or a combination of both. The most common symptoms attributable to these disorders are dyspnea on exertion, cough, wheezing, sputum production, hemoptysis, and chest pain.</p> <p>Physical impairment captures the non-mobility related disabilities and include the following body systems: special sense organs, cardiovascular, reproductive, digestive, genitourinary, hemic and lymphatic, skin, and endocrine.</p>
Other	The database included an "other" category for individuals that did not fit into one of the aforementioned categories.

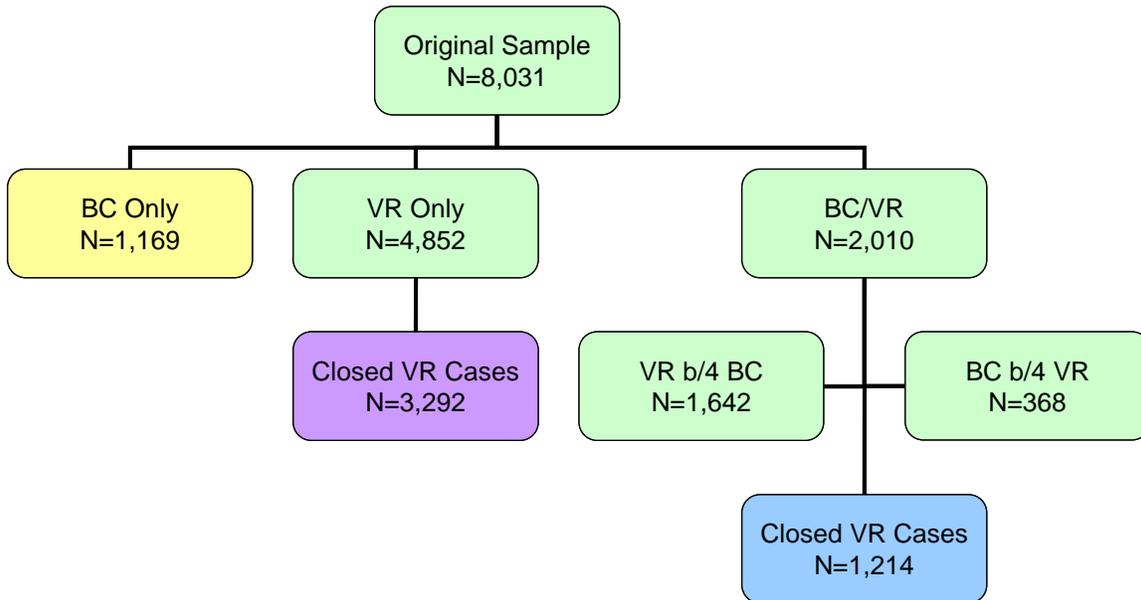
## **B. Statistical analyses**

Descriptive statistics including  $\chi^2$  for categorical variables and *t*-tests or one-way analyses of variance for continuous variables were used to describe and compare demographic characteristics between intervention groups. The association between post-intervention employment and selected predictive variables was examined with logistic regression. Logistic regression is a method for determining the relationship between predictor variables and a dichotomously coded dependent variable (in this case, employed yes/no). Modeling with logistic regression allows one to contrast different theoretical sets of predictor variables. Logistic regression methods are analogous to multiple linear regression methods. Logistic regression forms a predictor variable which is a linear combination of the explanatory variables. The values of this predictor variable are then transformed into probabilities by a logistic function or an odds ratio. The odds ratio is a measure of effect size in logistic regression. The definition of the odds of an event is  $\text{odds} = p/(1-p)$ , where *p* is the probability of the event of the study. The logarithm of  $p/(1-p)$  is called the logit, and maps probabilities onto the scale of the linear predictor in logistic regression. The log odds is the logarithm of the odds of the probabilities. The models for this report were built using forced entry of variable domains to test the association between selected domains and the dichotomized (employed vs. not employed) outcome. Four separate models were computed, one for individuals who received BC only, one for individuals who received VR only, one for individuals who received BC/VR, and one model with type of intervention treated as a covariate.

## **IV. Results**

Of the 8,031 individuals in the database, 15 percent ( $n=1,169$ ) were recipients of benefits counseling only, 60 percent received vocational rehabilitation only ( $n=4,852$ ) while a quarter (25%;  $n=2,010$ ) received a combination of benefits counseling (BC) and vocational rehabilitation (VR). For individuals receiving vocational rehabilitation services, active participants at the time of the data capture were removed ( $n=2,356$ ). Refer to Figure 1 below for a pictorial overview of the study population.

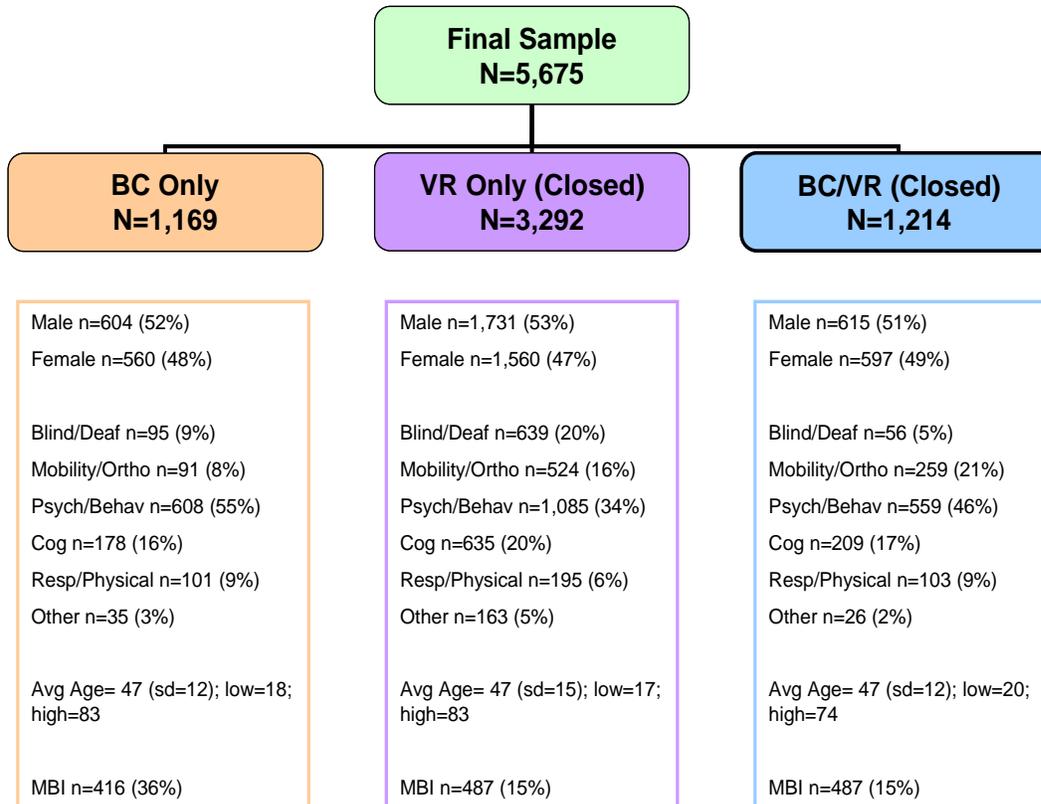
Figure 1. Pictorial Overview of the Study Population  
 Original Sample N=8,031;  
 Active Participants N=2,356 ((4,852-3,292) + (2,010-1,214));  
 Final Study Sample N=5,675



The three study samples (BC only, VR only, and BC/VR only) were remarkably similar demographically (see Figure 2 below). All groups included slightly more men than women, and all were similar in age (mean=47), though the difference between the high and low score was a bit wider for the VR only group (66 years versus 65 years for the BC only group and 54 years for the BC/VR only group). A higher proportion of the VR only consumers when compared to the two other groups had a disability diagnosis of blind/deaf (20% versus 9% for BC only and 5% for BC/VR only) and a lower proportion of psych/behavior (34% versus 55% for BC only and 46% for BC/VR only).

Figure 2. Demographic Characteristics of the Two Study Samples  
(BC=1,169; VR only=3,292; BC/VR=1,214)

\*note: missing data is excluded from summary statistics\*



The next set of figures is presented in sets of three: BC only, VR only, and BC/VR only. For all three groups, we considered two quarters of earnings data prior to the intervention and eight quarters of data post-intervention.

Figures 3a, 3b and 3c depict earnings pre and post-intervention, with respondents being classified into two of four categories: positive earnings (\$1+) pre-intervention, zero earnings (\$0) pre-intervention, positive earnings (\$1+) post-intervention, and zero earnings (\$0) post-intervention. The response options resulted in four combinations, detailed in the two figures below. Slightly less than half (n=538, 46%) of BC respondents had zero earning prior to the intervention and zero earning post-intervention while 27 percent (n=318) had zero earnings pre-intervention but positive earnings (\$1+) post-intervention. For the VR only group, a similar proportion had zero earnings both pre and post intervention (n=1,499, 46%) and 20% (n=657) had \$0 earnings post, but recorded earnings post intervention. In contrast, individuals who received BC/VR were more likely to emerge with earnings post-intervention after having zero earnings prior to the intervention (n=430, 35%).

Figure 3a. Pre-Post Earnings Categories BC Only Group  
 (positive earnings in one of two pre-quarters; positive earnings in one of eight post-quarters)  
 N=1,169

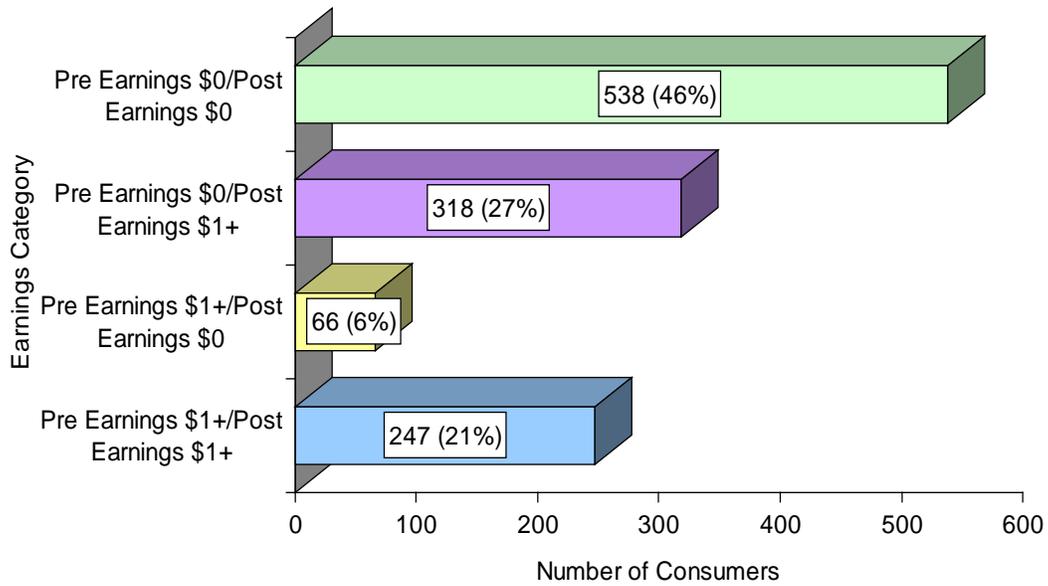


Figure 3b. Pre-Post Earnings Categories VR Only Group  
 (positive earnings in one of two pre-quarters; positive earnings in one of eight post-quarters)  
 N=3,292

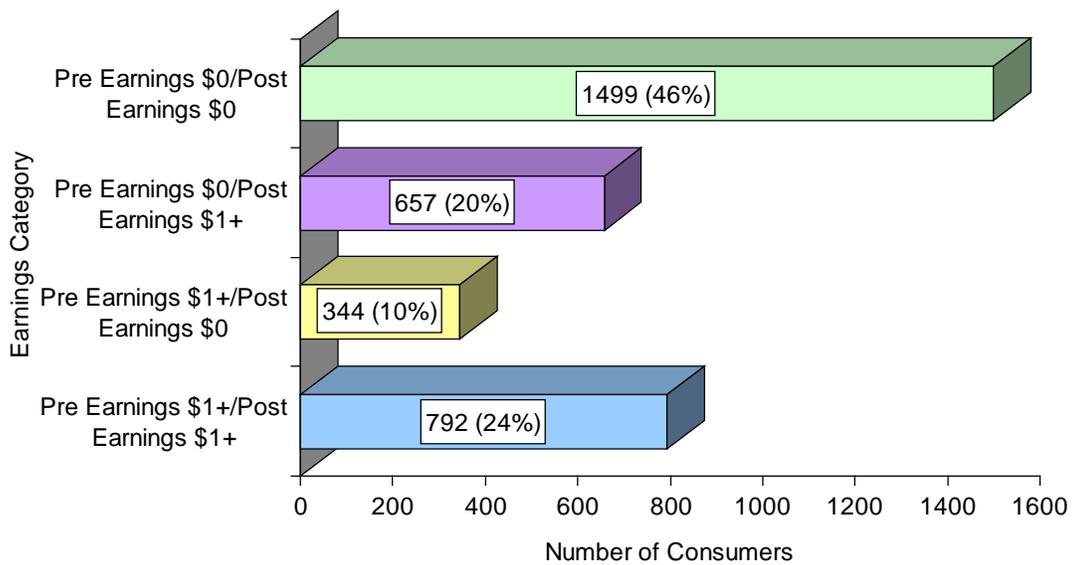
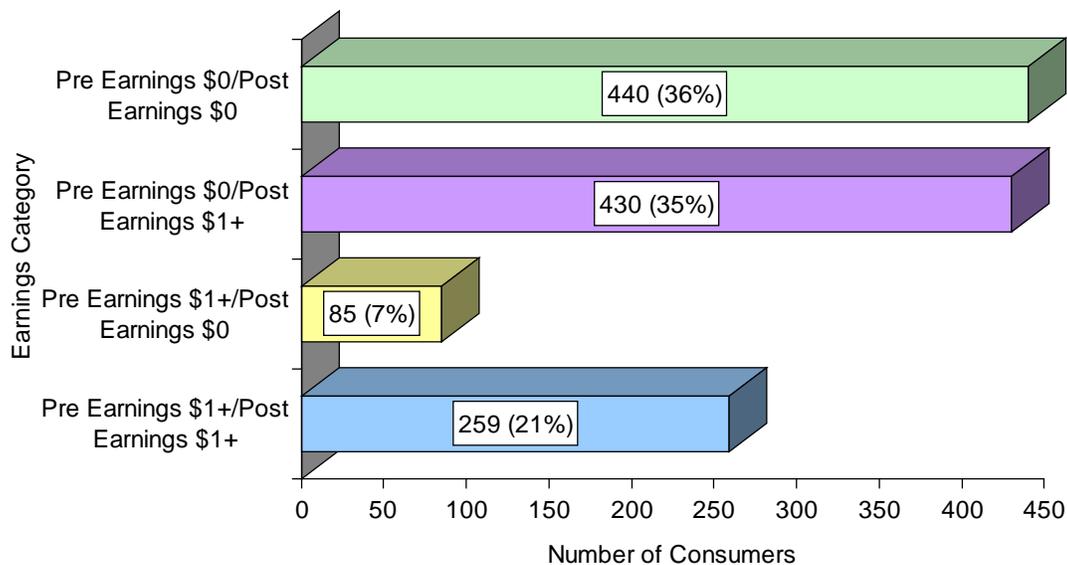


Figure 3c. Pre-Post Earnings Categories BC/VR Only Group  
 (positive earnings in one of two pre-quarters; positive earnings in one of eight post-quarters)  
 N=1,214



Figures 4a, 4b and 4c display average quarterly earnings for the BC, VR and BC/VR study groups; results include earnings data for two quarters pre-intervention and eight quarters post-intervention. It is important to note that both BC user groups showed increased earnings from pre-intervention to the quarter immediately following intervention; however, the actual earnings increase was smaller for the BC only group than the BC/VR combination group (\$180 vs \$330). The VR only group showed a slight drop in earning from pre to post intervention (\$128). All three groups showed a steady and consistent decline in average earnings in each quarter post-intervention with all three groups having earnings in the eighth quarter lower than baseline earnings (pre-intervention). However, both BC groups' mean earnings remained higher than their pre-intervention earnings through the fourth quarter. It is also important to note that data in each quarter is treated independent of other quarters and as a result the denominator does not change in the quarter by quarter analysis. For example, the denominator for each quarter of analysis for BC clients remains the same at 1,169. Earnings are summed for each quarter and divided by 1,169. The average quarterly earnings amounts could be impacted by two scenarios: the number of individuals with actual earnings changes in any quarter and/or the dollar amount of earnings changes.

Figure 4a. Average Pre-Post Earnings by Quarter BC Only Group  
N=1,169

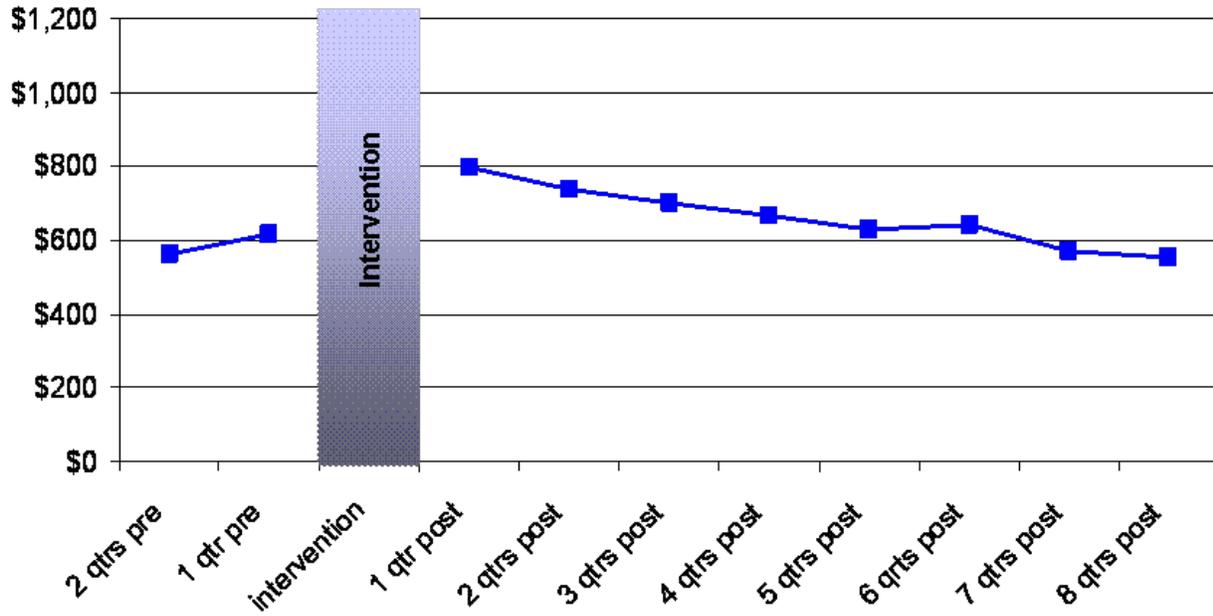


Figure 4b. Average Pre-Post Earnings by Quarter VR Only Group  
N=3,292

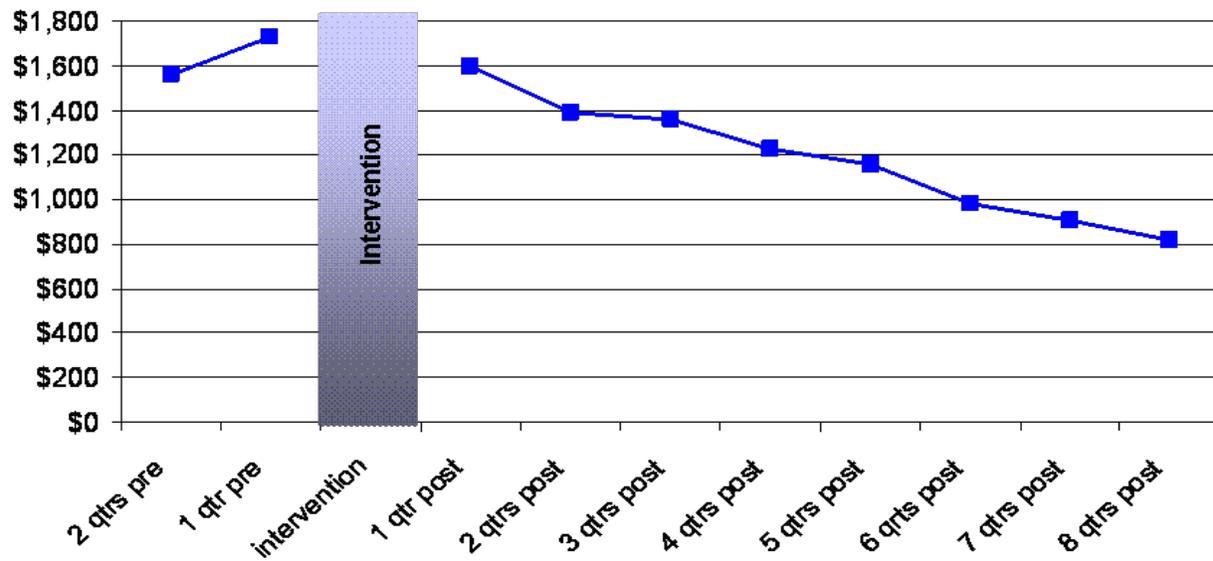
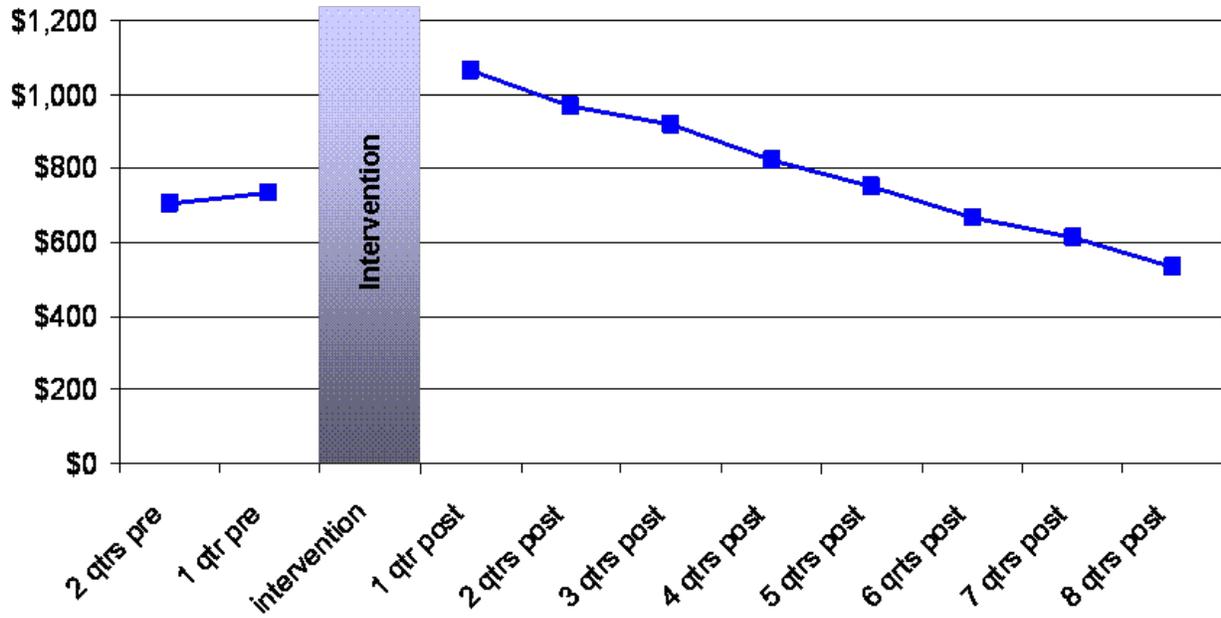


Figure 4c. Average Pre-Post Earnings by Quarter BC/VR Only Group  
N=1,214



As shown in Figures 5a, 5b and 5c, the actual number of individuals reporting earnings by quarter initially increases in the first quarter after intervention. Although the proportion in all three groups declines over the eight follow up quarters, the BC only group remained above their pre-intervention level for six quarters and the BC/VR group remained above their pre-intervention level until the eighth follow-up quarter. The VR only group drops below their pre-intervention level after only two quarters, losing 463 earners from the first quarter post to the eighth quarter post (see Figure 5c below).

Figure 5a. Number of Study Respondents with Positive Earnings by Quarter BC Only Group  
N=1,169

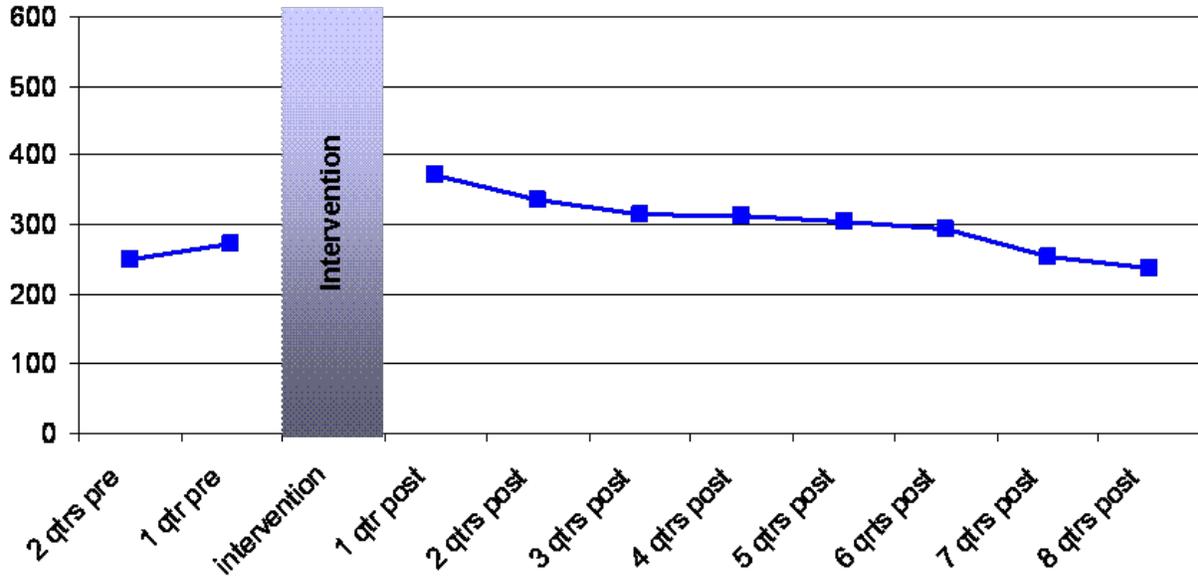


Figure 5b. Number of Study Respondents with Positive Earnings by Quarter VR Only Group  
N=3,292

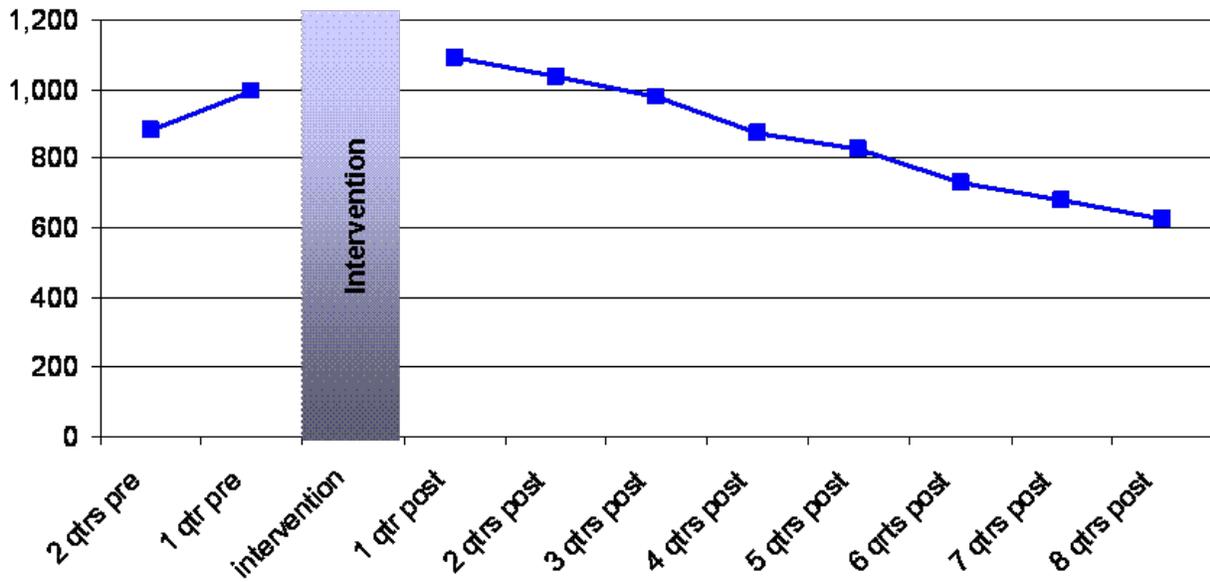
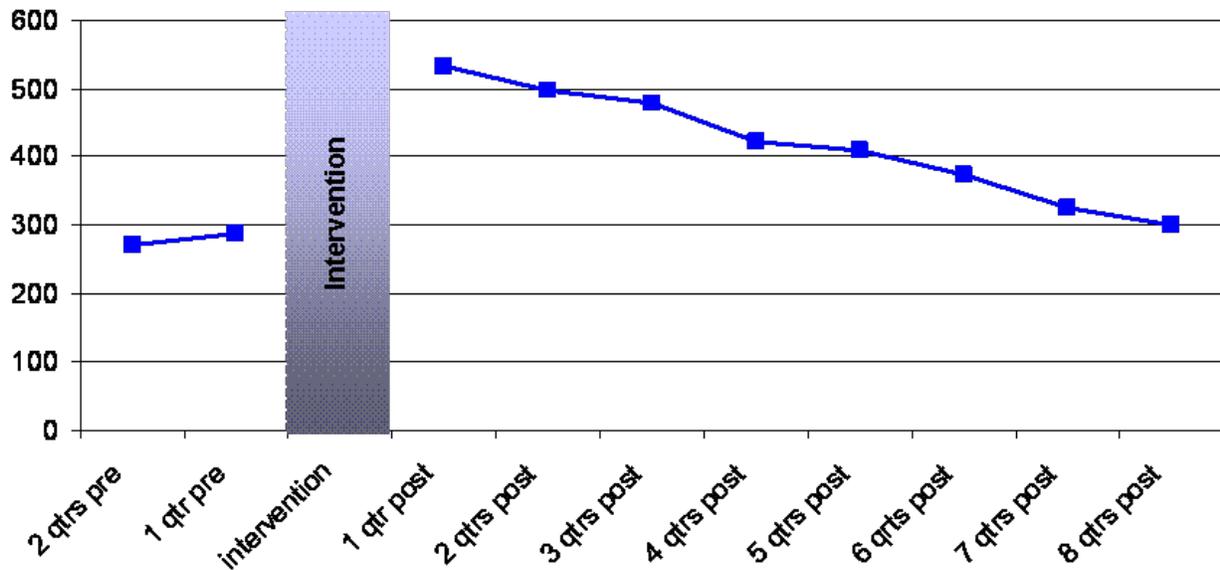


Figure 5c. Number of Study Respondents with Positive Earnings by Quarter BC/VR Only Group  
N=1,214



Three demographic variables were considered in the analyses: gender, age, and type of disability. For all three groups, men earned slightly more per quarter than women pre-intervention. However, in the BC only group women gained increased earnings significantly post intervention and remained at a higher earnings level for all eight quarters, whereas men increased earnings slightly for one quarter, then fell below their pre-intervention level. In the VR only group, both men and women decreased earnings post-intervention. In the BC/VR group, both men and women gained earnings initially, and women remained at a higher level longer than men (6 quarters vs. 4 quarters).

Figure 6a. Average Pre-Post Earnings by Gender by Quarter BC Only Group  
 (earnings of \$1+ by quarter)  
 N=1,169

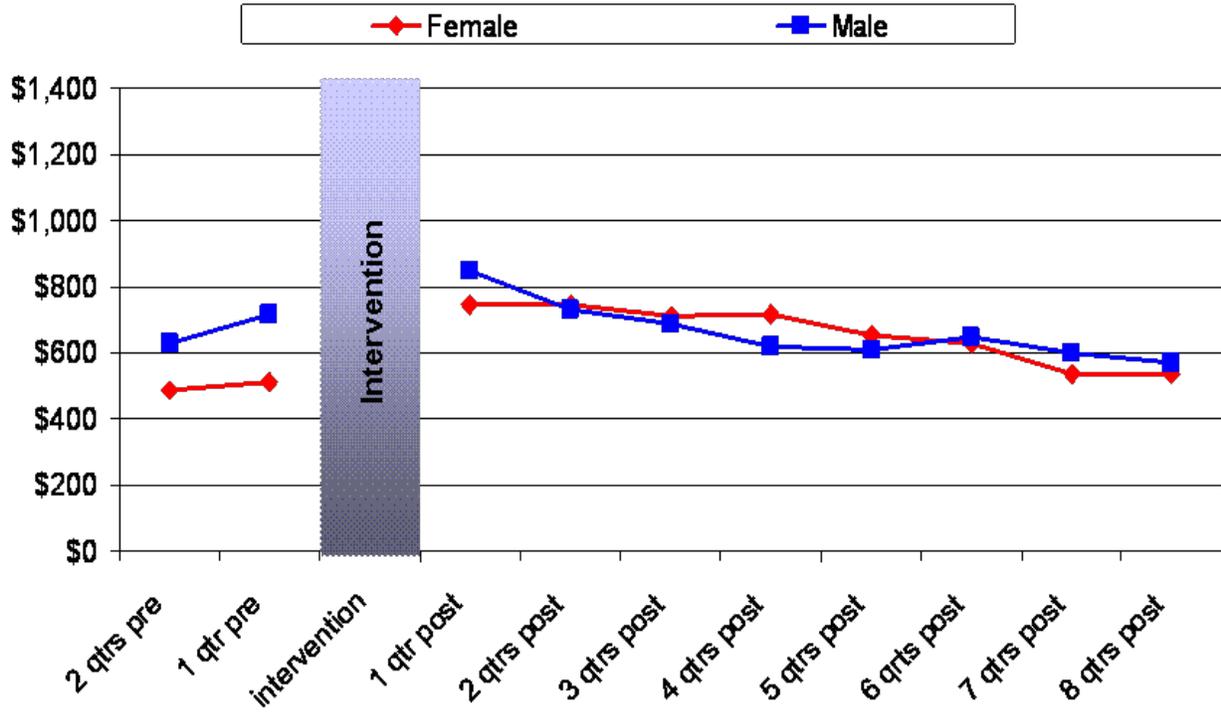


Figure 6b. Average Pre-Post Earnings by Gender by Quarter VR Only Group  
 (earnings of \$1+ by quarter)  
 N=3,292

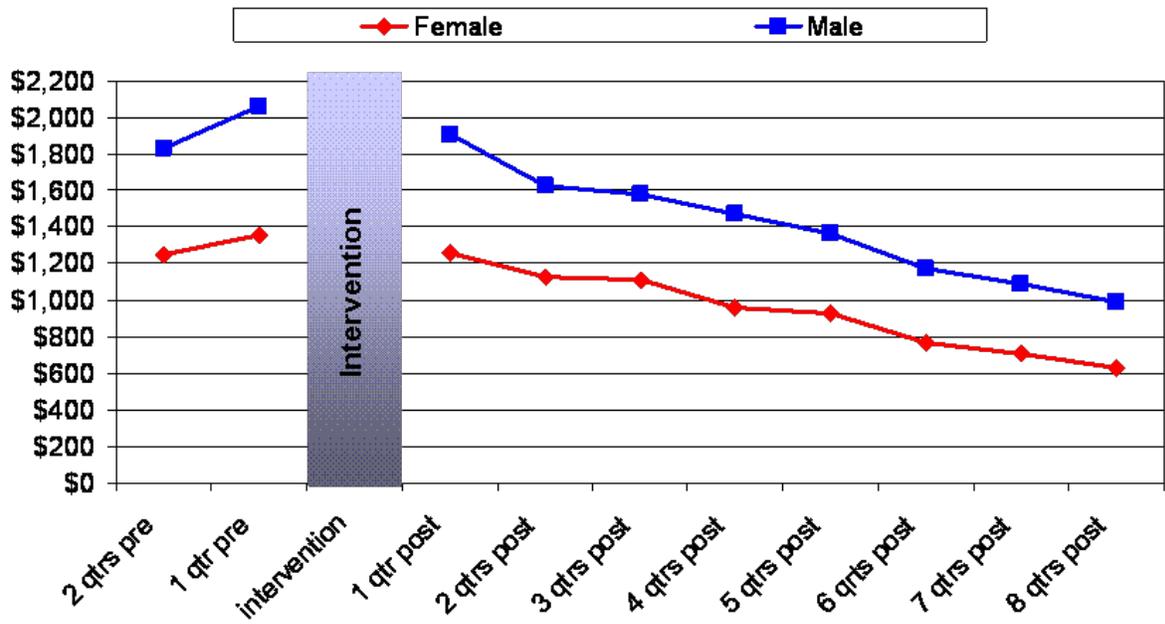
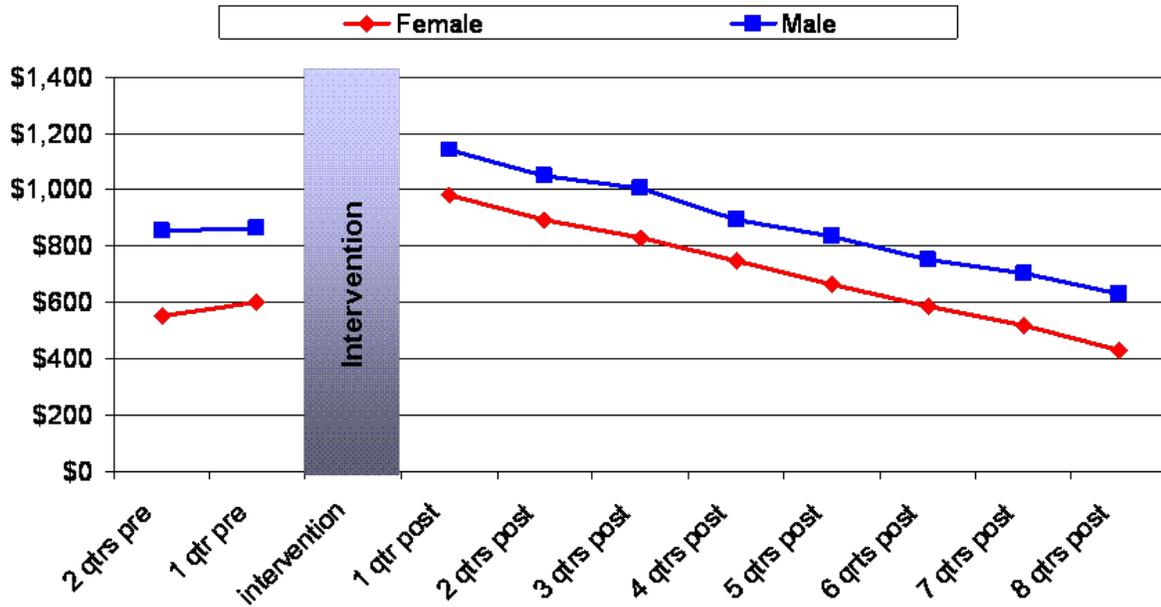


Figure 6c. Average Pre-Post Earnings by Gender by Quarter BC/VR Only Group  
 (earnings of \$1+ by quarter)  
 N=1,214



The middle age category (age 25 to <50) had the highest quarterly earnings for the BC only and the BC/VR groups. In the BC only group, each age category saw only slight earnings increases post intervention, and quickly reverted to pre intervention earnings or below. In the BC/VR group, all three age categories increased earnings substantially post-intervention. The BC/VR combined intervention appears to be particularly effective for the under age 25 group, whose average post-intervention earnings remained above their pre-intervention earnings throughout all eight follow-up quarters. Individuals between ages 25 and 50 in the BC/VR group also maintained their higher earnings through the first four post-intervention quarters. For the VR only group, individuals in the 50+ age category earned substantially more than the other two groups both pre and post-intervention. However, the older group experienced a steep post intervention earnings decline, whereas the other two age groups maintained fairly steady earnings.

Figure 7a. Average Pre-Post Earnings by Age Category by Quarter BC Only Group  
 (earnings of \$1+ by quarter)  
 N=1,169

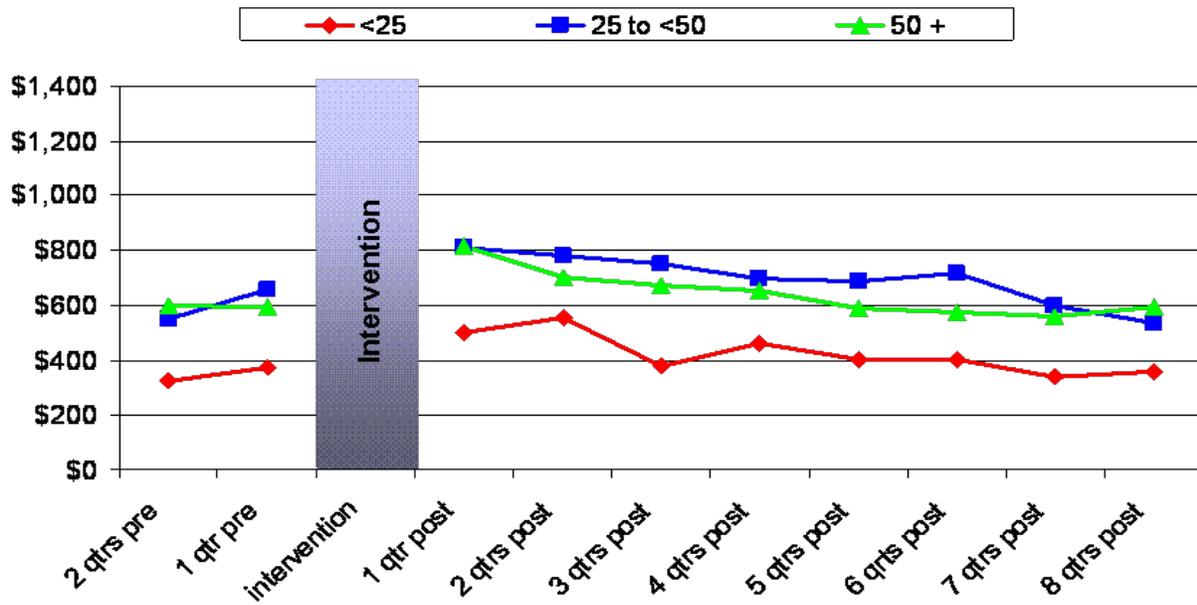


Figure 7b. Average Pre-Post Earnings by Age Category by Quarter VR Only Group  
 (earnings of \$1+ by quarter)  
 N=3,292

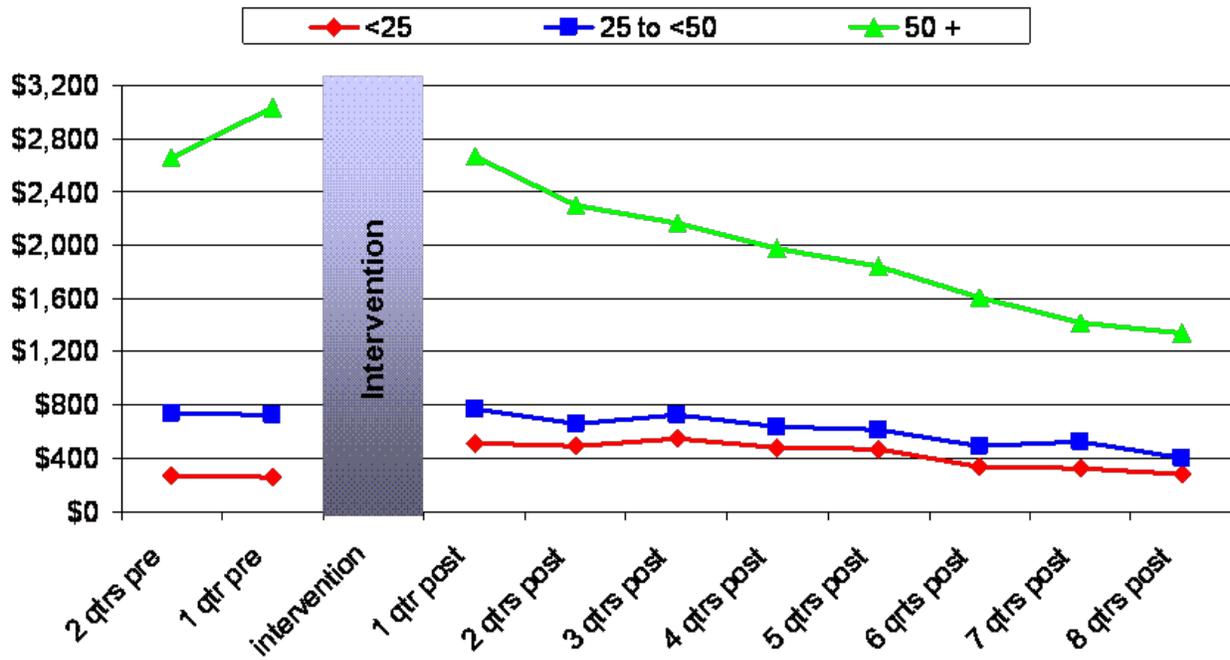
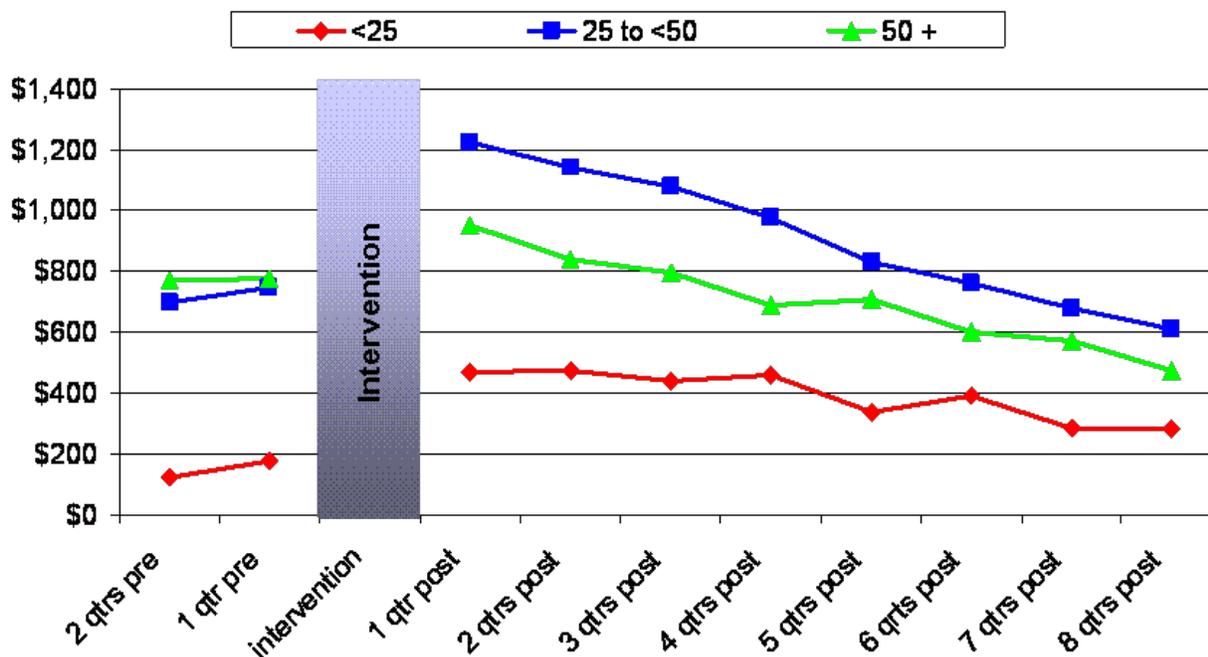


Figure 7c. Average Pre-Post Earnings by Age Category by Quarter BC/VR Only Group  
(earnings of \$1+ by quarter)  
N=1,214



Effectiveness of the BC and VR programs also differed by disability type. Five major disability categories were considered: blind/deaf<sup>1</sup>, mobility/orthopedic, psychiatric/behavioral, cognitive/learning, respiratory/physical. For the BC only group, individuals with mobility limitations showed increased earnings from baseline for three consecutive quarters post intervention though their was a consistent decline each quarter. Those individuals classified as blind/deaf emerged from the intervention with earnings lower than baseline and demonstrated a steady decline at each time point post intervention. Those classified with a psychiatric, behavioral, cognitive, learning, respiratory or physical disability emerged exited the intervention earning substantially larger amounts than baseline. Though there was a steady downward trend for all eight quarters post intervention, earnings at each time point remained above baseline numbers. For the VR only group, the blind/deaf and psychiatric behavioral population started out with much lower pre-intervention earnings than the other groups, but emerged from the intervention with much higher earnings relative to baseline numbers. Earnings remained fairly throughout the subsequent eight quarters. Interestingly, the mobility/orthopedic group showed gradual increases in earning for seven of the eight post-intervention quarters. For the BC/VR group, all disability groups except blind/deaf had a slight increase in post-intervention earnings, but this number remained relatively flat for each quarter post-intervention with slight decreases that merit noting. The blind/deaf group showed a steady and consistent decrease post-intervention.

<sup>1</sup> Individuals with a diagnosed disability of blindness usually receive VR services from BESB and not from BRS. As a result, the majority of individuals in the blind/deaf category are deaf.

Figure 8a. Average Pre-Post Earnings by Disability Type by Quarter BC Only Group  
 (earnings of \$1+ by quarter)  
 N=1,169

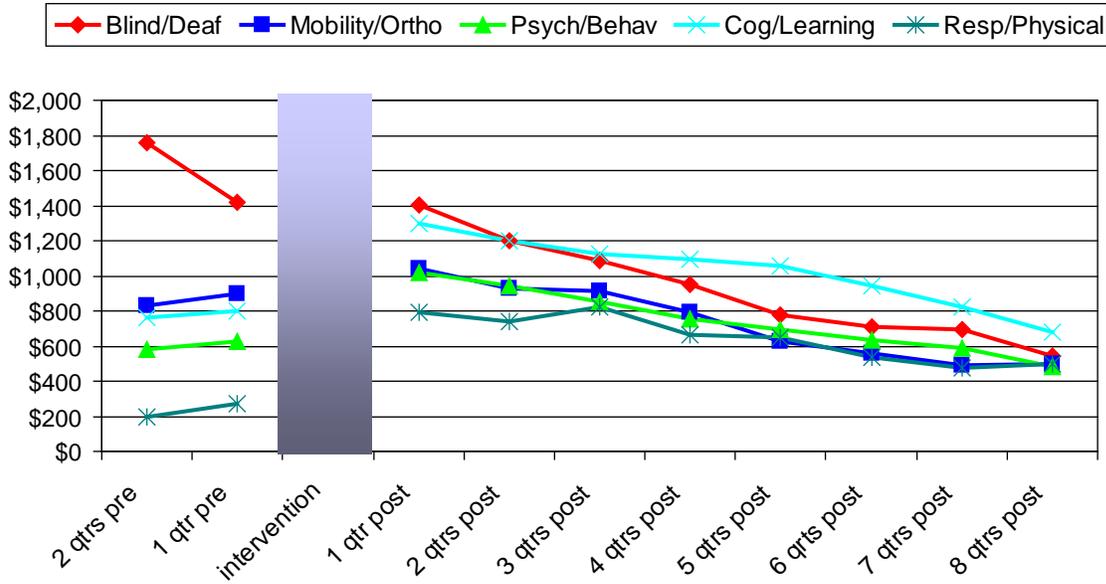


Figure 8b. Average Pre-Post Earnings by Disability Type by Quarter VR Only Group  
 (earnings of \$1+ by quarter)  
 N=3,292

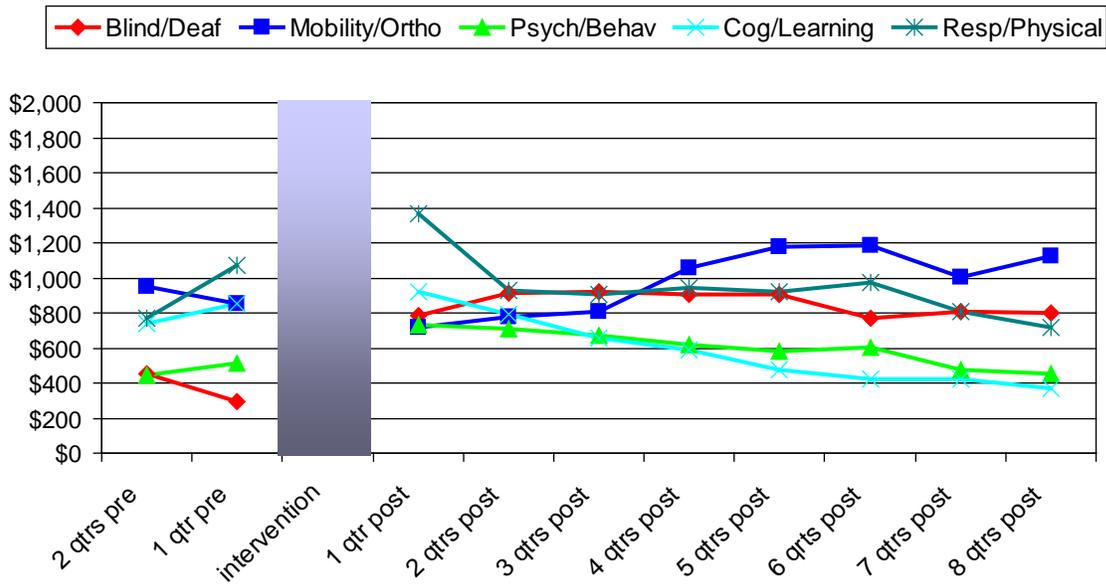


Figure 8c. Average Pre-Post Earnings by Disability Type by Quarter BC/VR Only Group  
(earnings of \$1+ by quarter)  
N=1,214



Participation in the Medicaid Buy-In program was strongly associated with post-intervention earnings relative to pre-intervention earnings for all three study groups (see Figures 9a, 9b, and 9c). In the BC group, those who participated in the MBI program maintained their higher post-intervention earnings through the sixth quarter. The MBI participants in the VR group's post-intervention earnings were higher than pre-intervention for five quarters, whereas those not participating in MBI decreased earnings post-intervention. MBI participants in the BC/VR group nearly doubled earnings immediately post-intervention, and continued to earn more through the seventh quarter, relative to their pre-intervention earnings.

Figure 9a. Average Pre-Post Earnings by Medicaid Buy-In Status by Quarter BC Only Group  
N=1,169

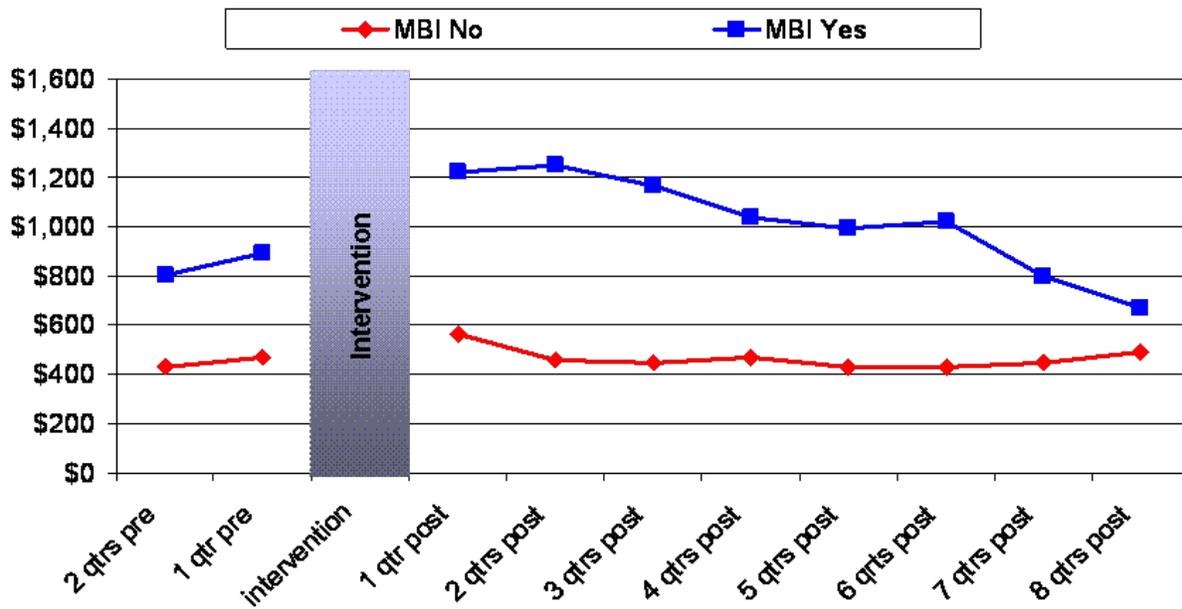


Figure 9b. Average Pre-Post Earnings by Medicaid Buy-In Status by Quarter VR Only Group  
N=3,292

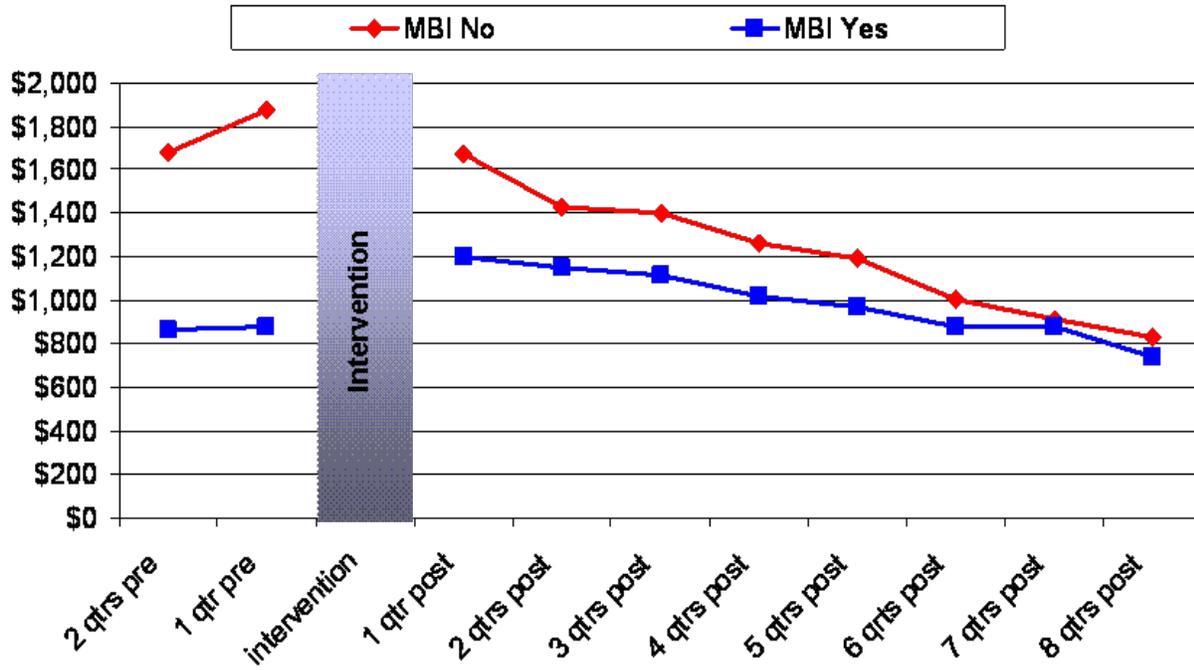
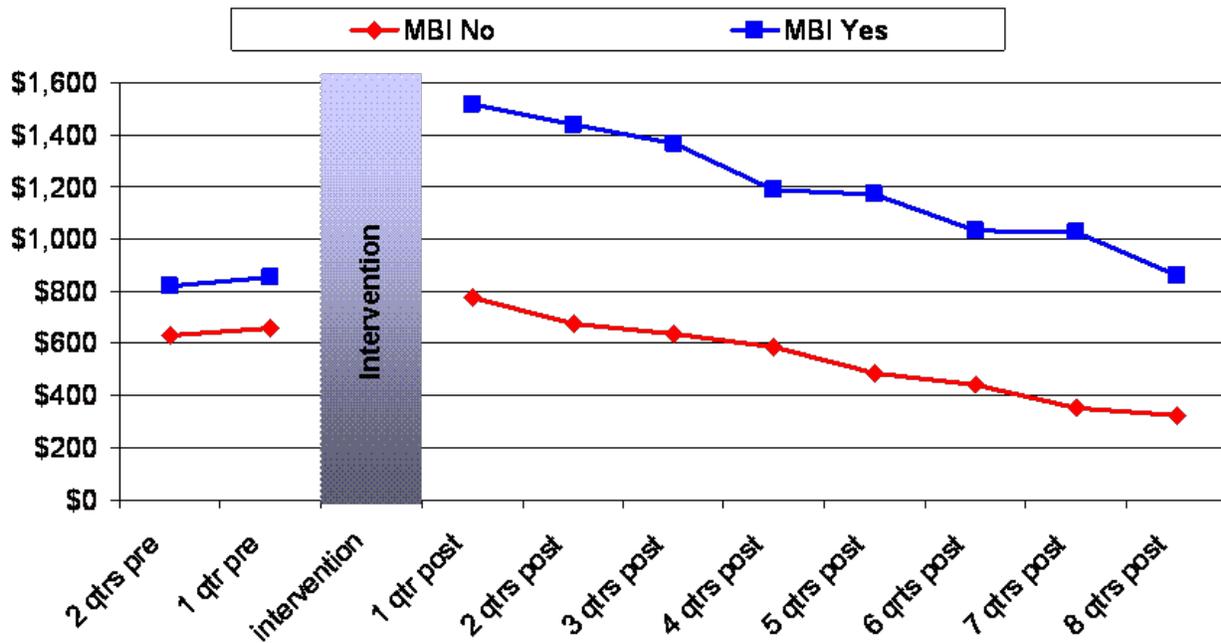


Figure 9c. Average Pre-Post Earnings by Medicaid Buy-In Status by Quarter BC/VR Only Group  
N=1,214



Figures 10a and 10b display a relationship between length of time in VR (sub-divided into three categories) by quarterly earnings. In the VR only group, those receiving services for over one year had substantially lower earnings both pre and post-intervention than the other two groups. All three groups had lower earnings post-intervention. The findings were dramatic for the BC/VR only group which demonstrated substantial initial earnings increases post intervention for all three groups. However, only those receiving services for less than six months maintained those earnings increases for all 8 quarters.

Figure 10a. Average Pre-Post Earnings by Length of Time in VR by Quarter VR Only Group  
N=3,292

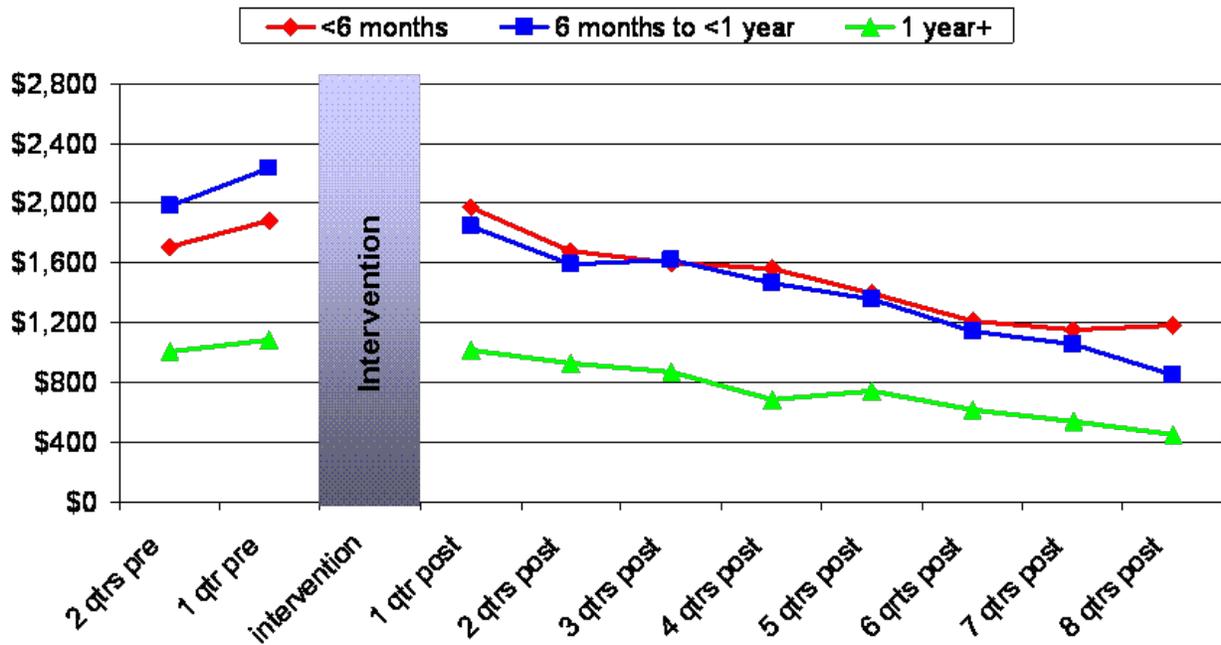
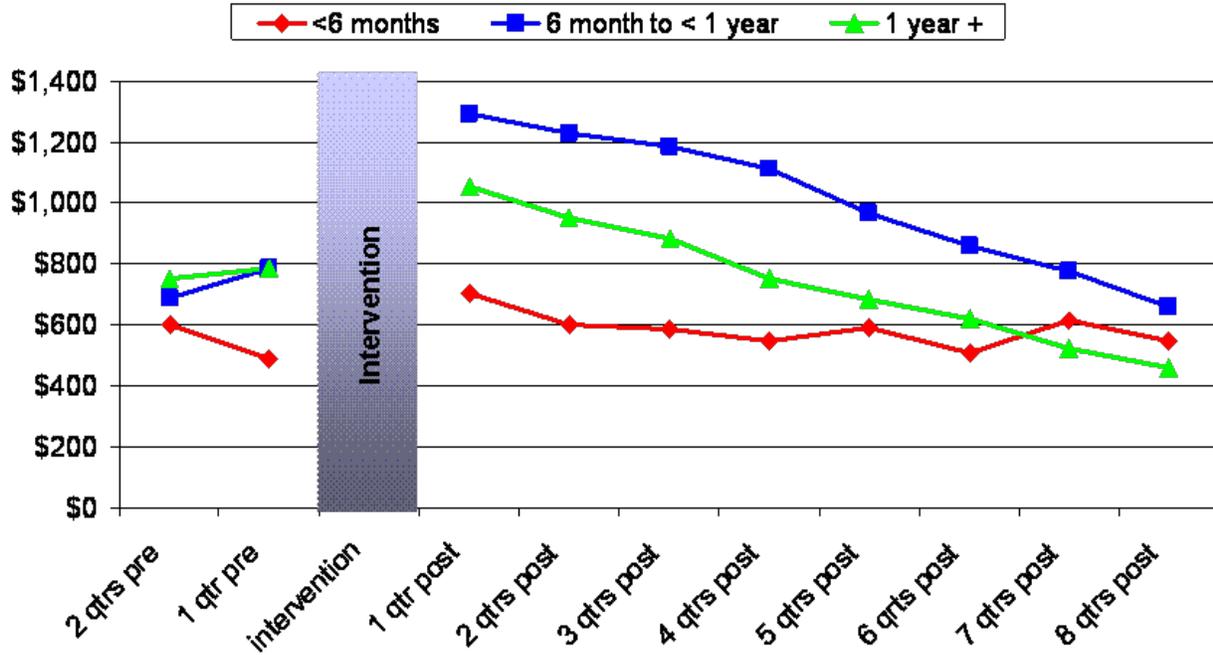


Figure 10b. Average Pre-Post Earnings by Length of Time in VR by Quarter BC/VR Only Group  
N=1,214



Logistic regression is a technique for analyzing models in which there are one or more independent variables that determine an outcome. The outcome is measured with a dichotomous variable (in which there are only two possible outcomes). The goal of logistic regression is to find the best fitting model to describe the relationship between the dichotomous characteristic of interest (dependent variable = response or outcome variable) and a set of independent (predictor or explanatory) variables. For ease of interpretation, Table 2 below provides a brief explanation of how to interpret logistic regression output tables.

Table 2. Logistic Regression Terms and Concepts

Term or Concept	Explanation
B	Logistic coefficients, also called unstandardized logistic regression coefficients, are simply parameter estimates. They correspond to the b coefficients in OLS regression.
SE	Is the estimated standard deviation of the unstandardized regression coefficient.
Wald	The Wald statistic is an alternative test which is commonly used to test the significance of individual logistic regression coefficients for each independent variable (that is, to test the null hypothesis in logistic regression that a particular logit (effect) coefficient is zero). The Wald statistic is the squared ratio of the unstandardized logistic coefficient to its standard error. The Wald test corresponds to significance testing of b coefficients in OLS regression.
Sig	The significance or p-value is the probability of obtaining a test statistic at least as extreme as the one that was observed, assuming that the null hypothesis is true.
Exp(B)	Odds ratios or Exp(B) is the natural log base, e, to the exponent, b, where b = the parameter estimate. Note that when b=0, Exp(b)=1, so therefore an odds ratio of 1 corresponds to an explanatory variable which does not affect the dependent variable. An Exp(b)>1 means the independent variable increases the logit and therefore increases odds(event). If Exp(b) = 1.0, the independent variable has no effect. If Exp(b) is less than 1.0, then the independent variable decreases the logit and decreases odds(event).  odds ratio = exp(b) b = ln(odds ratio)
-2 Log likelihood	The -2LL statistic is the likelihood ratio, also called goodness of fit. It reflects the significance of the unexplained variance in the dependent variable. The likelihood ratio is not used directly in significance testing, but it is the basis for the likelihood ratio test, which is the test of the difference between two likelihood ratios (two -2LL's), as discussed below. In general, as the model becomes better, -2LL will decrease in magnitude.
Cox & Snell R Square	Cox and Snell's R <sup>2</sup> is an attempt to imitate the interpretation of multiple R-Square based on the log likelihood of the final model vs. log likelihood for the baseline model, but its maximum can be (and usually is) less than 1.0, making it difficult to interpret.
Nagelkerke R Square	Nagelkerke's R <sup>2</sup> is a modification of the Cox and Snell coefficient to assure that it can vary from 0 to 1. That is, Nagelkerke's R <sup>2</sup> divides Cox and Snell's R <sup>2</sup> by its maximum in order to achieve a measure that ranges from 0 to 1. Therefore Nagelkerke's R <sup>2</sup> will normally be higher than the Cox and Snell measure.
Chi-square	Chi-square tests the overall model. A well-fitting model is significant at the .05 level or better, meaning the model is significantly different from the one with the constant only. That is, a finding of significance (p<=.05 is the usual cutoff) leads to rejection of the null hypothesis that all of the predictor effects are zero. When this likelihood test is significant, at least one of the predictors is significantly related to the dependent variable.

The models in this report were built using forced entry of variable domains to test the association between these domains and the dichotomized (zero earnings vs. positive earnings) outcome indicating employment.

Table 3a below shows the independent predictors on employment (0=no earning; 1=positive earnings) for individuals receiving BC only. Three variables contributed significantly to the model. Individuals employed at the time of benefits counseling (intervention) are 4.45 times ( $p=.000$ ) more likely to be employed in subsequent quarters post-intervention than individuals with \$0 earning at the time of the counseling session. Individuals who participated in the Medicaid Buy-In program were 5.41 times more likely to be employed after the intervention than individuals not engaged in the Buy-In program. Finally, relative to individuals with respiratory/physical disabilities (the reference category), three groups were less likely to have earnings post-intervention (only the difference for people with cognitive disabilities was significant), and individuals who are blind/deaf are 1.88 times more likely to be employed than individuals with physical disabilities, though the difference was not statistically significant.

Table 3a. Predictors of Post-Intervention Employment; BC Only Group  
N=1,073

	<b>B</b>	<b>SE</b>	<b>Wald</b>	<b>Sig</b>	<b>Exp(B)</b>
employed at intervention (yes)	1.49	.174	73.51	.000	4.449
gender (male)	.041	.143	.082	.775	1.042
age < 25 vs age 50+	-.337	.364	.859	.354	.714
age 25 to 50 vs age 50+	-.003	.147	.000	.984	.997
MBI (yes)	1.688	.157	116.051	.000	5.408
blind/deaf vs. respiratory/physical	.633	.328	3.708	.054	1.882
mobility/orthopedic vs. respiratory/physical	-.422	.339	1.548	.213	.656
psychiatric/behavioral vs. respiratory/physical	-.308	.257	1.434	.231	.735
cognitive/learning vs. respiratory/physical	-.746	.301	6.148	.013	.474
Constant	-.751	.278	7.282	.007	.472

-2 Log likelihood=1185.11  
Cox & Snell R Square=.245  
Nagelkerke R Square=.327  
Chi-square=301.89; Sig=.000

Table 3b displays the relationship between a set of independent variables and post-intervention employment for VR only recipients. Five variables were significantly associated with the outcome of interest: individuals with employment at the time of intervention were 4.69 times more likely to have post-intervention employment when compared to those without employment at baseline. Men were 1.18 times more likely to have earnings post-intervention than women. Age had a positive relationship to the outcome of interest; being under the age of 25 (versus over the age of 50) results in a 40% greater chance of employment. Consistent with all models, enrollment in the Buy-In program had a positive impact on post intervention employment (Exp(B)=4.82; p=.000). Individuals who had a disability diagnosis of blind/deaf relative to those who have a respiratory/physical disability were 1.8 times more likely to have post-intervention employment (Exp(B)=1.79; p=.002).

Table 3b. Predictors of Post-Intervention Employment; VR Only Group  
N=3,292

	<b>B</b>	<b>SE</b>	<b>Wald</b>	<b>Sig</b>	<b>Exp(B)</b>
employed at intervention (yes)	1.55	.088	308.800	.000	4.686
gender (male)	.162	.082	3.912	.048	1.176
age < 25 vs age 50+	.338	.152	4.922	.027	1.402
age 25 to 50 age vs 50+	-.037	.092	.165	.685	.963
MBI (yes)	1.573	.123	164.360	.000	4.822
blind/deaf vs. respiratory/physical	.584	.187	9.749	.002	1.794
mobility/orthopedic vs. respiratory/physical	-.211	.191	1.222	.269	.810
psychiatric/behavioral vs. respiratory/physical	.063	.176	.126	.723	1.065
cognitive/learning vs. respiratory/physical	.076	.187	.163	.686	1.079
VR days 6 months to <1 year vs <6 months	.016	.103	.025	.874	1.016
VR days 1+ years vs <6 months	-.103	.105	.972	.324	.902
Constant	-1.207	.187	41.183	.000	.299

-2 Log likelihood=3568.99  
Cox & Snell R Square=.192  
Nagelkerke R Square=.258  
Chi-square=657.68; Sig=.000

Table 3c depicts the predictors on post-intervention employment for individuals who received a combination of BC/VR. Positive pre-earnings was a significant predictor (Exp(B)=2.68; p=.000) of employment. Individuals between the ages of 25 and <50 were 1.43 times (p=.009) more likely to be employed than individuals over the age of 50. Similar to the BC only group, participation in MBI was a strong predictor of post-intervention employment; MBI participants were 5.34 times more likely to have positive earnings than those who were not in the MBI program. When comparing all disability groups to the reference category (respiratory/physical), the probability of employment was higher; significantly so for those with cognitive disabilities (2.01 times higher). Finally, a short tenure in VR (<6 months) resulted in a decreased probability of employment relative to individuals who were engaged in VR for six months or longer.

Table 3c. Predictors of Post-Intervention Employment; BC/VR Only Group  
N=1,186

	<b>B</b>	<b>SE</b>	<b>Wald</b>	<b>Sig</b>	<b>Exp(B)</b>
employed at intervention (yes)	.985	.157	39.368	.000	2.679
gender (male)	-.037	.132	.078	.780	.964
age < 25 vs age 50+	.333	.309	1.161	.281	1.394
age 25 to 50 age vs 50+	.358	.136	6.889	.009	1.430
MBI (yes)	1.676	.146	132.205	.000	5.344
blind/deaf vs. respiratory/physical	.672	.381	3.113	.078	1.958
mobility/orthopedic vs. respiratory/physical	.130	.260	.248	.619	1.138
psychiatric/behavioral vs. respiratory/physical	.445	.241	3.405	.065	1.561
cognitive/learning vs. respiratory/physical	.698	.276	6.372	.012	2.009
VR days 6 months to <1 year vs <6 months	.474	.205	5.355	.021	1.606
VR days 1+ years vs <6 months	.377	.188	4.025	.045	1.457
Constant	-1.084	.247	19.250	.000	.338

-2 Log likelihood=1363.33  
Cox & Snell R Square=.196  
Nagelkerke R Square=.263  
Chi-square=258.62; Sig=.000

We chose to run a fourth model whereby the type of intervention was treated as a covariate in the model with the VR only group serving as the reference category. This approach allowed us to include all participants in the model (N=5,675). Consistent with the univariate results, the BC/VR only group relative to the VR group does significantly better overall, and are 4.3 times (430%) more likely to report earnings post-intervention. Employment at the time of intervention continues to have a positive influence on post-intervention outcomes, when controlling for all other variables in the model. Interestingly enough, in the composite model, individuals over the age of 50 are more likely to secure employment post intervention, though the difference between the age 25 to 50 group was not significantly different. MBI continues have a significant and positive association with employment post-intervention (Exp(B)=2.41 p=.000). The results are displayed in Table 1d.

Table 4d. Predictors of Post-Intervention Employment; Whole Sample  
N=5,675

	<b>B</b>	<b>SE</b>	<b>Wald</b>	<b>Sig</b>	<b>Exp(B)</b>
employed at intervention (yes)	1.042	.063	275.678	.000	2.834
gender (male)	.083	.059	1.965	.161	1.087
age < 25 vs age 50+	-.457	.109	17.689	.000	.633
age 25 to 50 age vs 50+	-.010	.065	.026	.873	.990
MBI (yes)	.880	.071	154.473	.000	2.411
blind/deaf vs. respiratory/physical	1.122	.138	65.687	.000	3.071
mobility/orthopedic vs. respiratory/physical	.017	.136	.016	.899	1.017
psychiatric/behavioral vs. respiratory/physical	.351	.126	7.775	.005	1.420
cognitive/learning vs. respiratory/physical	.497	.135	13.538	.000	1.644
BC/VR only vs VR only	1.456	.074	385.948	.000	4.287
BC only vs VR only	-20.349	1174.170	.000	.986	.000
Constant	-2.090	.128	267.293	.000	.124

-2 Log likelihood=6924.746  
Cox & Snell R Square=.222  
Nagelkerke R Square=.323  
Chi-square=1907.053; Sig=.000

## V. Conclusions

Few groups of adult Americans have higher rates of unemployment or lower rates of participation in the labor force than people with disabilities. The program rules for Social Security, Medicare and Medicaid with regard to work are complex. The standard of disability from which eligibility for these programs is determined is tied to the inability to be engaged in substantial gainful activity in the national economy—a substantial barrier that prevents people with disabilities from working. However, long standing policies permit employment in certain circumstances. Over time, Congress has enacted additional legislation to remove more of the disincentives to work and make it easier for people with disabilities to work. Individuals who choose to take advantage of work-related incentives often turn to vocational rehabilitation programs and/or benefits counseling for guidance and support. While employment or increased earnings is often the desired outcome, many individuals seek benefits counseling for the purpose of information only. So, while the goal might have been achieved, the end result had zero impact on overall earnings (a negative outcome in our analysis).

Consistent with prior studies, a large number of individuals who receive VR, BC, or BC/VR enter the program with \$0 earnings and continue to have \$0 earnings post-intervention. However, even though disability policy is complicated and serves as a disincentive to employment, substantial proportions of individuals who receive services from the Bureau of Rehabilitation Services leave the system gainfully employed.

In reviewing univariate models, individuals who received benefits counseling earned approximately \$200 more in the quarter immediately following intervention. After eight quarters, the group maintained baseline earnings levels. The group receiving the BC/VR combination earned almost \$400 more in the quarter immediately following the intervention and maintained higher than baseline earnings for five quarters post-intervention.

On an extremely positive note, when one considers actual participants with earnings, all three interventions groups saw an increase in the number of positive wage earners post-intervention. The numbers were dramatic for the BC/VR group with about 290 positive earners prior to the intervention, and 540 positive earners post intervention (out of a total of 1,214 individuals).

The relationship between age and earnings was complicated. The most dramatic difference was for the BC/VR group; those between the ages of 25 and 50 were 1.4 times more likely to have earnings than the group over age 50. In fact, earnings for the 25 to 50 age group almost doubled in the first quarter post intervention.

VR resulted in positive financial outcomes for three disability groups: mobility/orthopedic, blind/deaf and psychiatric/behavioral. In addition, several disability groups experienced positive changes in earnings following benefits counseling including, respiratory/physical, cognitive/learning, and psychiatric behavioral.

All three groups who enrolled in the Medicaid Buy-In program at any time during the study period (January 1, 2002 to June 30, 2008) experienced substantial positive changes in earnings following the BC and/or VR intervention. For example, the BC only group saw quarterly earnings increase by almost \$300 per quarter, and earnings remained above baseline for seven quarters post intervention. The VR only group also saw earnings increase post-intervention from \$850 to \$1,200. Increased earnings remained through six quarters. Finally, the BC/VR group saw earnings almost double following intervention (\$840 to \$1,550). This

group maintained higher than baseline earnings throughout the entire eight quarter post-intervention period. It is important to note that in order to enroll in the MBI program, consumers must have a job, a significant predictor of future positive earnings. The sequencing of events (vocational rehabilitation/benefits counseling/Medicaid Buy-In) is extremely important for future quantitative outcome evaluation efforts.

Knowing the MBI employment requirement, we constructed multivariate models to control for pre-intervention employment. Despite this, enrollment in MBI had a significant and positive impact on quarterly earnings. In addition, having employment of any kind prior to either of the three intervention types had a positive impact on employment and earnings.

The most positive earnings outcomes came for individuals who received the combination intervention (BC and VR). Not only did the actual likelihood of employment increase significantly, but quarterly earnings were higher following intervention, and the duration of higher earnings was also greater.

Finally, the results from this study, though positive in nature, lacked the magnitude both in terms of absolute changes in earnings and sustained positive earnings over time found in the prior referenced articles (Tremblay et al., 2006; Sell et al., 2009). Several explanations could be attributed to the differences. First, individuals in the Sell et al., study were participants in the Wisconsin SSDI Employment Pilot, essentially a pool of volunteers who are not representative of the working age SSDI, SSI or Medicaid populations included in our work. Second, the data elements included in the study were extremely limited in scope (e.g., lacked basic demographic information), so this greatly hindered comparability to our work. The Tremblay et al., article had three notable limitations relative to our study. First, there was no discussion regarding the analytical treatment of individuals classified as \$0 earners at any quarter during the study period; a situation that impacts more than 50 percent of the study population at any time point. The inclusion of non-earners greatly reduces the magnitude of earnings' outcomes. Second, the intervention group had significantly higher earnings at baseline than both of the comparison groups. This suggests a cohort bias and could impact the overall study results. Finally, the sample in the Tremblay et al., study was seven years younger than our study group, which is important given that the reported findings demonstrate an inverse relationship between age and earnings.

The outcomes from this report demonstrate that it might be possible to steer individuals to interventions that would be most beneficial for them. Further, the team should work to make poor performing interventions more effective for the groups that do not do as well.

## References

- Beverly, C., & Alvarez, A. R. (2003). Employment and empowerment of people with disabilities: A social development perspective. In David P. Moxley and John R. Finch (Eds.), *Sourcebook of Rehabilitation and Mental Health Practice* (pp. 27-36). New York: Kulwer Academic Publishers.
- Brault, Matthew W. *Americans with Disabilities: 2005*. Rep. U.S. Census Bureau, Nov. 2008. (Internet release). Retrieved August 20, 2009 from <http://www.census.gov/prod/2008pubs/p70-117.pdf>.
- Bruyère, S. (2000). *Disability employment Policies and practices in private and federal sector organizations*. Ithaca, NY: Cornell University, School of Industrial and Labor Relations Extension Division, Program on Employment and Disability. Retrieved November 5, 2008, from <http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1062&context=edicollect>
- Capella, M. E. (2003). Comparing employment outcomes of vocational rehabilitation consumers with hearing loss to other consumers and the general labor force. *Rehabilitaion Counseling Bulletin*, 47, 24-33.
- Centers for Medicaid and Medicare (2008). Overview: Ticket to Work and Work Incentives Improvement Act of 1999. Retrieved November 10, 2008, from <http://www.cms.hhs.gov/TWWIIA/>
- Evans, J., & Repper, J. (2000). Employment, social inclusion and mental health. *Journal of Psychiatric and Mental Health Nursing*, 7, 15-24.
- GAO (2007, March). *Vocational Rehabilitation: Earnings Increased for Many SSA Beneficiaries after Completing VR, but Few Earned Enough to Leave SSA's Disability Rolls*. Report to Congressional Requestors. (No. 07-332). Washington, DC: United States Government Accountability Office. Retrieved November 18, 2008, from <http://www.gao.gov/new.items/d07332.pdf>
- Golden, T. P., O'Mara, S., Ferrell, C., & Sheldon, J. (2000). A theoretical construct for benefits planning, assistance, and outreach. Ithaca, NY: Cornell University, Program on Employment and Disability. Retrieved November 17, 2008, from <http://www.ilr.cornell.edu/extension/files/download/theoretical%20construct.pdf>
- Hamilton, M., & Shumate, S. (2005). The role and function of certified vocational evaluation specialists. *Journal of Rehabilitation*, 71, 5-19.
- Hasnain, R., & Sotnick, P. (2003). Person-centered planning: A gateway to improving vocational rehabilitation services for culturally diverse people, with disabilities. *Journal of Rehabilitation*, 69, 10-18.
- Kennedy, R. B., & Harris, N. K. (2003). Employing people with severe disabilities: The challenge remains. *Journal of employment counseling*, 40, 80-86.

- Kosciulek, J. F. (2004). Empowering people with disabilities through vocational rehabilitation counseling. *American Rehabilitation*, 28, 40-47.
- Loprest, P. & Maag, E. (2001, January). *Barriers and supports for work among adults with disabilities: Results from the NHIS-D*. The Urban Institute, Washington DC. Retrieved November 5, 2008, from <http://www.urban.org/UploadedPDF/adultswithdisabilities.pdf>
- Mullins, J., Roessler, R., Schriener, K., Brown, P., & Bellini, J. (1997, Oct.-Dec.). Improving employment outcomes through quality rehabilitation counseling. *Journal of Rehabilitation*, 21-31.
- National Council on Disability (2005). *The Social Security Administration's efforts to promote employment for people with disabilities. New solutions for old problems*. Retrieved November 10, 2008, from <http://www.ncd.gov/newsroom/publications/2005/pdf/ssa-promoteemployment.pdf>
- National Organization on Disability (2004, June 24). Landmark disability survey finds pervasive disadvantages. Retrieved November 5, 2008, from <http://www.nod.org/index.cfm?fuseaction=Feature.showFeature&FeatureID=1422>
- National Institute on Disability and Rehabilitation Research (2007). ADA definition of disability. Retrieved November 5, 2008, from <http://www.adata.org/about/definition.html#definition>
- Power, P. W. (2006). Operationalizing the concept of empowerment during the vocational assessment process. *Journal of Applied Rehabilitation*, 37, 21-25.
- President Bush, G. W. (2001). The New Freedom Initiative. Retrieved November 17, 2008, from <http://www.whitehouse.gov/news/freedominitiative/freedominitiative.html>
- President Clinton, B. (1998). National Task Force on Employment of People. Retrieved November 10, 2008, from [http://www.workworld.org/ptfead/ptfead\\_13078.pdf](http://www.workworld.org/ptfead/ptfead_13078.pdf)
- President Clinton, B. (1998). Workforce Investment Act. Retrieved November 10, 2008, from [http://www.doleta.gov/seniors/other\\_docs/105-220.pdf](http://www.doleta.gov/seniors/other_docs/105-220.pdf)
- President Clinton, B. (2000). Amendment of Executive Order 13078, To Expand the Role of the National Task Force on Employment of Adults with Disabilities to Include a Focus on Youth. Retrieved November 10, 2008, from [http://www.workworld.org/ptfead/ptfead\\_13172.pdf](http://www.workworld.org/ptfead/ptfead_13172.pdf)
- President Clinton (2001). President's Disability Employment Board. Retrieved November 5, 2008, from [http://www.workworld.org/ptfead/ptfead\\_13187.pdf](http://www.workworld.org/ptfead/ptfead_13187.pdf)
- Pruett, S. R., Swett, E., A., Fong, C., Rosenthal, D. A., & Lee, G. K. (2008). Empirical evidence supporting the effectiveness of vocational rehabilitation. *Journal of Rehabilitation*, 74, 56-63.
- Rehabilitation Act of 1973, Public Law 93-112. Retrieved November 5, 2008, from <http://www.dotcr.ost.dot.gov/documents/ycr/REHABACT.HTM>

- Rehabilitation Research and Training Center on Disability Demographics and Statistics (2007). *2006 Disability Status Report* (Ithaca, NY: Cornell University). Retrieved November 5, 2008, from [http://www.ilr.cornell.edu/edi/disabilitystatistics/StatusReports/2006-PDF/2006-StatusReport\\_US.pdf?CFID=3941088&CFTOKEN=30118475&jsessionid=f030127e6173283d760b706f151a4e7f3c64](http://www.ilr.cornell.edu/edi/disabilitystatistics/StatusReports/2006-PDF/2006-StatusReport_US.pdf?CFID=3941088&CFTOKEN=30118475&jsessionid=f030127e6173283d760b706f151a4e7f3c64)
- Sell, C., Hartman, E., & Delin, B. (April 2009). Preliminary Benefits Counseling and Employment Outcomes for SSDI-EP Participants. University of Wisconsin - Stout.
- Shur, L. (2002). The difference a job makes. *Journal of Economic Issues*, 36, 339-347.
- Smith, J., Porter, A. (2004). Benefits counseling: A proven strategy for promoting independence and self-sufficiency. Vermont Work Incentives Initiative. Retrieved November 18, 2008, from <http://www.dad.state.vt.us/dvr/vocrehab/vwii/assets/docs/VRBenefitsCounseling-ppt.pdf>
- Steinmetz, E. (2006, May). *Americans with Disabilities: 2002*. U. S. Census Bureau: Current Population Reports. Retrieved November 4, 2008, from <http://www.census.gov/prod/2006pubs/p70-107.pdf>
- Tigges, S. (2004). Slaying dragons: Building self-confidence and raising expectations through orientation center training. *American Rehabilitation*, 28, 30-39.
- Tremblay, T., Smith, J., Xie, H., & Drake, R. E. (2006). Effect of benefits counseling services on employment outcomes for people with psychiatric disabilities. *Psychiatric Services*, 57, 816-821.
- U.S. Census Bureau (2000). *Meeting the challenge: Americans with Disabilities 1997*. Population profile of the United States (Internet release). Retrieved November 5, 2008, from <http://www.census.gov/population/www/pop-profile/profile2000.html>
- U.S. Census Bureau (2009). *Number of Americans with a Disability Reaches 54.4 Million*. (Internet release). Retrieved August 20, 2009 from [http://www.census.gov/PressRelease/www/releases/archives/income\\_wealth/013041.html](http://www.census.gov/PressRelease/www/releases/archives/income_wealth/013041.html).
- U.S. Department of Labor (2008). *History and mission of the Office of Disability Employment Policy (ODEP)* (Internet release). Retrieved November 10, 2008, from <http://www.dol.gov/odep/about/about.htm>
- Wehman, P., Revell, W. G., & Brooke, V. (2003). Competitive employment: Has it become the "first choice yet?" *Journal of Disability Policy Studies*, 14, 163-173.
- Wehmeyer, M. L. (2004). Self-determination and the empowerment of people with disabilities. *American Rehabilitation*, 28, 22-29.
- Wilson, J. (2004). Our commitment to the empowerment of individuals with disabilities. *American Rehabilitation*, 28, 1.

Young, K. A. (2001). Working toward recovery in New Hampshire: A study of modernized vocational rehabilitation from the viewpoint of the consumer. *Psychiatric Rehabilitation Journal*, 24, 355-367.