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Policy for Persons with Disabilities

Research Report

Characteristics or Incentives: Why Do Employment Outcomes for the SSA Beneficiary Clients of VR Agencies Differ, on Average, from Those of Other Clients?

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October 2004

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This Research Report is being distributed by the Rehabilitation Research and Training Center for Economic Research on Employment Policy for Persons with Disabilities at Cornell University.

This center is funded to Cornell University, in collaboration with The Urban Institute (Washington, DC), by the U.S. Department of Education, National Institute on Disability and Rehabilitation Research (No. H133B980038). The contents of this paper do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government (Edgar, 75.620 (b)). The views in this policy brief are not necessarily endorsed by Cornell University or the American Association of People with Disabilities.

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1. Introduction

Clients of state vocational rehabilitation (VR) agencies who also receive income support from either of two disability programs administered by the Social Security Administration (SSA) – Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) – attain lower employment and earnings outcomes than other VR clients. The differences were most recently documented in the findings from the Longitudinal Study of Vocational Rehabilitation Services Programs (LSVRSP). For instance, Hayward and Schmidt (2003a) find that of those achieving an employment outcome, 43.9 percent were receiving SSDI or SSI benefits at study entry, versus 55.1 percent for those not achieving an employment outcome. The reasons for these outcome differences are not known. In this paper we consider two possible explanations: differences in personal characteristics, and differences in economic incentives.

Beneficiary clients (i.e., those clients who are receiving SSDI or SSI benefits at the time of application for VR services) presumably have personal characteristics that are different, on average, than those of non-beneficiary clients, and these differences might reduce their relative prospects for employment and earnings. It seems likely that the physical and mental conditions underlying their disabilities are different in their nature, and are, on average, more severe. All beneficiary clients have been determined by SSA to be unable to work at any substantial gainful activity (SGA) by reason of a medically determinable impairment that will last for at least 12 months or end in death.[1] Differences are not necessarily as large as the previous observation might suggest, however. Beneficiaries who use VR services might typically have less severe medical conditions than other SSA beneficiaries, and some may have experienced at least partial medical improvement since SSA's determination. Further, some non-beneficiary clients might meet the SSA standard, and some might be in the benefit application process. Thus,

[1] We use the term "beneficiary client" to refer to VR clients that are either SSDI or SSI beneficiaries, or both. Although the two programs are different in significant ways that could impact work outcomes for beneficiary clients, and the beneficiaries have markedly different characteristics that affect work outcomes, the conceptual issues we investigate apply to both programs. Further, as discussed later, we are skeptical about the validity of the information in the LSVRSP data concerning which program the client receives benefits from.

although it seems likely that the physical and medical conditions of beneficiary clients are more challenging, on average, than those of all SSDI and SSI beneficiaries when it comes to work, we do not know how large the differences are.

Other personal characteristics might also disadvantage the work efforts of beneficiary clients relative to non-beneficiary clients, on average. This might be especially true for SSI recipients, many of whom have had their condition since birth or childhood, have limited education, and/or have little or no work experience before receiving VR services. Other personal issues that might make work more problematic for beneficiary clients than others include: difficult marital and living situations; relatively low income, less in-kind and/or moral support from family and friends; membership in disadvantaged racial or ethnic groups; family responsibilities that compete with work; inadequate housing; and transportation problems.

It also seems likely that beneficiary clients typically have less economic incentive to obtain substantial earnings than non-beneficiary clients, holding personal characteristics constant, because doing so would result in loss of some or all of their benefit income. Their public health insurance benefits, which are linked to their income benefits, might also be jeopardized. SSDI beneficiaries who work can retain their income benefits indefinitely, as long as their monthly earnings are below the SGA level and they continue to meet SSA's medical eligibility criteria, but they lose their benefits entirely once their earnings are above SGA level ($500 per month during the study period) after a Trial Work Period (TWP).[2] The TWP allows a beneficiary to have substantial earnings for nine out of 60 consecutive months before earnings above the SGA level would lead to benefit loss. Certain Impairment Related Work Expenses (IRWEs) are deducted from earnings before the SGA test is applied.[3] SSDI beneficiaries receiving benefits for 24 months or longer are also entitled to Medicare. During the period of relevance to our data, Medicare benefits terminated 36 months after SSDI termination.[4]

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[2] The SGA for blind beneficiaries is substantially higher. Because the number of blind beneficiaries in the sample is very small, we ignore this distinction in the analysis.
[3] During the period under consideration, a month was counted as a TWP month only if earnings were above $350 after deductions for IRWEs.
[4] The 1999 Ticket to Work and Work Incentives Improvement Act extended this period to 8.5 years.

SSI recipient earnings are subject to the provisions of Section 1619 of the Social Security Act; monthly payments are reduced by one dollar for every two dollars earned after a small earnings disregard and deductions for IRWEs and any earnings set aside under a Plan to Achieve Self Support (PASS). In most states all SSI recipients are categorically eligible for Medicaid, and in others most are. Medicaid rules vary by state, but until recently eligibility was jeopardized for almost all SSI recipients if SSI payments ended and the recipient's income increased beyond a limit set by Section 1619.[5] For beneficiaries in both SSA programs, the risk of health insurance loss is particularly important for those who might not be able to obtain jobs from employers that provide employee health insurance benefits, as well as for those who have health care service needs that might be poorly covered by private insurers.

VR agencies may serve to reinforce these disincentives. Although not well documented, there is much anecdotal evidence that VR counselors and others who act as formal or informal advisors to beneficiary clients reinforce the effects of the disincentives that are inherent to the SSDI and SSI programs, because they often believe it is in the client's best interest to maintain benefit eligibility. The long history of less successful outcomes for beneficiary clients, along with counselor knowledge of work disincentives for beneficiaries, might also translate into reduced expectations for beneficiary success. Hence, even after due consideration of a client's individual characteristics, a VR agency might invest fewer of its scarce resources in a beneficiary client than a non-beneficiary client.

Countering this point, however, is the fact that SSA will pay VR agencies for services provided to SSA beneficiary clients if certain earnings conditions are met, whereas providing services to other clients does not typically have the potential for generating additional funding.[6] During the period relevant to our study, SSA reimbursed VR agencies for costs up to a limit related to potential benefit savings provided that the beneficiary achieved earnings above the SGA level for at least nine months. Thus, VR

[5] Recent implementation of Medicaid buy-in programs in a significant number of states has mitigated the risk of losing Medicaid because of work, but substantial risk remains in most states (Goodman and Livermore, 2004).

[6] The recent introduction of the Ticket to Work program increased the incentives that VR agencies have to help beneficiaries attain earnings sufficient to end their income benefits.

agencies have greater financial incentives to help beneficiary clients achieve successful employment outcomes than they do for other clients, holding other characteristics constant.[7]

In this paper we use the LSVRSP data to document the differences between VR outcomes for beneficiary and non-beneficiary clients in more detail. We consider outcomes at every stage over the period captured by this longitudinal study: eligibility determination, service delivery, closure and the approximately 12-month period after closure. We also assess the extent to which observed differences can be explained by differences in the characteristics of beneficiary and non-beneficiary clients at the time of their application for VR services. The LSVRSP contains information on such characteristics that is much richer than in any other available data set. If incentives play a significant role in explaining outcome differences, then substantial differences should remain after controlling for differences in characteristics. The data do not support a formal test of whether incentives matter, because characteristics not captured in the data might explain residual differences in outcomes. They do, however, allow us to determine how much of a role potentially remains for incentives after controlling for client characteristics at application.

In Section 2 we describe the LSVRSP data, define the variables we use in this study, and discuss the statistical methods employed. We then consider each of the following questions:

1. How do the medical and non-medical characteristics of applicants for VR services during this period differ by beneficiary status? (Section 3)

2. To what extent does the probability of being determined eligible depend on beneficiary status, before and after controlling for characteristics at application? Similarly, to what extent does the probability of service receipt depend on beneficiary status, before and after controlling for differences in characteristics at application? (Section 4)

[7] Note that SSA's rules for paying a VR for services provided to an beneficiary do not require earnings sufficient to terminate SSA benefits. In fact, because of the work incentive provisions of the SSI and SSDI programs, a beneficiary can, with some care, earn enough to meet SSA's rules for paying the VR, but remain eligible for benefits. Potentially, a VR counselor could help ensure that a beneficiary client earns enough to meet SSA's payment criteria, but not enough to lose the client's eligibility for SSA benefits.

3. For those who actually receive services, how does the likelihood of rehabilitation at closure vary with beneficiary status, before and after controlling for other characteristics at application? (Section 5)

4. For those closed as "rehabilitated," how is beneficiary status related to employment in competitive and paid jobs at closure, before and after controlling for other characteristics at application. We focus on employment in competitive jobs and employment in paid jobs. For those in paid jobs, we further consider the relationship between beneficiary status on closure job characteristics (hourly wages, hours worked, monthly earnings, health insurance, earnings above SGA, and profession, managerial or technical occupation), before and after controlling for other characteristics at application. (Section 6)

5. For those who receive services, how does beneficiary status affect employment in competitive and paid jobs at "follow-up" (approximately 12 months after closure)? For those in paid jobs, we further consider the relationship between beneficiary status and closure job characteristics, before and after controlling for other characteristics at application. (Section 7)

6. For those who receive services, how are months of paid employment of served clients during the entire 15 month period from three months prior to closure to 12 months after closure related to beneficiary status? During the same period, how is the probability of earnings above SGA for at least nine months related to beneficiary status, both before and after controlling for other characteristics at application? (Section 8)

We summarize the findings and draw conclusions in Section 9.

2. Data and Methods

A. The LSVRSP Data

The LSVRSP followed a sample of applicants to and consumers of VR services, through a series of interviews and administrative data abstraction efforts. Data collection began in 1995 and ended in 2000. Sample acquisition was spread over the first two years, and each of the 8,500 participants was tracked for three years. The study followed a multistage design that involved selection of a random sample of 40 local VR offices, located in 30 states, and, among those offices, a sample of 8,500 applicants and current and former consumers of VR services. The study included three cohorts, defined by their stage in the VR service process at the time of the first interview. The "applicant" cohort makes up 25 percent of the sample; respondents were first interviewed while they applied for VR services. The "recipient" cohort makes up 50 percent of the sample and

respondents were first interviewed while they were receiving VR services. The "exited" cohort makes up 25 percent of the sample and respondents were first interviewed shortly after closure.

Each sample member was administered a baseline interview and up to three annual follow-up interviews. The questionnaires varied across the three cohorts, reflecting their differing stages in the VR process. Topics covered include work history, functioning, vocational interests and attitudes, independence and community integration, and consumer perspectives on VR participation. Records abstraction included consumer characteristics and detailed information on services; records were abstracted when the consumer entered the study and quarterly until the person exited VR.[8]

In the remainder of this paper we use "follow-up" to refer to data collected at approximately 12 months after closure. The follow-up survey that these data correspond to varies across the three sample cohorts.

B. Characteristics at application

Characteristics of the client at the time of application for VR services play an important role in the analyses. We focus on characteristics at application because we are interested in how the characteristics of the client affect VR outcomes. Some characteristics change as VR services are delivered, and others may change at later periods. For some this change is clearly exogenous to outcomes of interest (e.g., age), but for many others it is possible that changes are an outcome of the use of VR services.

Because data collection for the three cohorts of the LSVRSP starts at different points in the process, data on some characteristics at application are not collected in an identical fashion for members of all three cohorts. Fortunately, many of the most important characteristics were abstracted from VR agency records. Variables included in the analysis include conventional measures for demographic variables (sex, age, race, marital status, and dependents), as well as extensive data on the individual's income benefits, disability, education, and work experience. Characteristics at application that

[8] See RTI International (2003) for further details. The cited document, the data, codebooks, instruments, and additional technical information can be found at www.lsvrsp.org.

were not collected for all three cohorts are generally not used in the analysis. Perhaps most significantly, we did not include psychosocial measures for concepts such as self-esteem and motivation that are available at application for the applicant cohort, but the other two.

The key income benefit variable is for the SSI and SSDI programs. Although the data set includes separate indicators for SSI and SSDI, and also distinguishes between the three categories of SSI (blind, disabled and aged), and there are important distinctions between these two programs, in most of the analysis we have used a single indicator (i.e., dummy) variable to indicate receipt of either SSI or SSDI benefits at application. The reason for this simplification is that the two programs are often confused by beneficiaries and others, in part because the programs have many common features, including administration by the same agency, use of the same medical eligibility criteria, and use of the same eligibility determination process. Further, some beneficiaries move from one program to the other as non-medical factors affecting eligibility (e.g., satisfaction of the SSDI five-month waiting period, and satisfaction of the SSDI work history requirements) change. Statistics for the reported SSI and SSDI categories appear in Section 3.[9]

We also include indicator variables for income support from each of these additional sources: Aid to Families with Dependent Children (AFDC – replaced during the study period by Temporary Assistance to Needy Families), veterans' benefits, workers compensation, private disability insurance, and family or friends. Some respondents also lived in special facilities for people with disabilities. We include indicators for institution, substance abuse treatment center, supported living, and other.

The disability variables include an indicator for acquired (versus congenital) onset, the indicator for severity that is used by the VR agencies (not severe, severe, most severe) and a categorical variable for disability type. Concerning the latter, the LSVRSP collected extensive information about disability type through its data abstraction efforts. These data are very rich, but complex. In addition, because of differences in recording practices across states, and even across counselors within states, we found that much work needed to be done to develop categorical variables that would be useful for our

[9] The LSVRSP collected data on benefit income at application. That information would have been useful to this study, but is not included in the public use data file.

analysis. This was especially true for the many records with psychiatric and orthopedic conditions. Descriptive statistics for the full set of disability-related variables appear in Section 3. For our multivariate analyses, we simplified these variables into a single 15-category variable, aggregating across groups with relatively few respondents. The categories are: hearing, learning disability, mental retardation, non-orthopedic physical, orthopedic – 3 or more limbs, orthopedic – other accident, orthopedic – other, neurosis, psychotic depression/bi-polar disorder, schizophrenia/paranoia/other psychosis, other mental illness, substance abuse, traumatic brain injury, and vision.

The LSVRSP has conventional measures of education as well as information on receipt of special education. In Section 3 we report educational information for the highest level of education achieved ("educational attainment"), cross classified by receipt of special education. In about 16 percent of cases special education status is not known. For the multivariate analysis we constructed a 7-category variable that reflects the joint distribution of educational attainment and receipt of special education, derived by aggregating categories with few respondents into adjacent categories.

The LSVRSP also has extensive information on the work experience and training of VR clients prior to VR application. In most analysis we include variables for: prior VR receipt, work status at application (working, homemaker/unpaid family worker, student, trainee/volunteer, looking for work, not looking for work), work for at least two weeks in the 24 months prior to application, work prior to disability onset, and work after disability onset.

C. Closure status

The VR agency assigns a status code to each client's case. The status code is updated as the client continues through the rehabilitation process, and a final status code is assigned at closure. The closure status codes found in the LSVRSP data are indicated in Exhibit 2.1. For our purposes, we refer to those with closure status code 8 as "ineligible," and all others as "eligible." Among those eligible, we refer to those with closure status 30 as "not served," and all others as "served." Among those served, we refer to those closed in status 26 as "rehabilitated" and those in status 28 as "not rehabilitated." Closure status 38 is for clients who receive post-employment services

before closure. As there were only five such closures in the sample and some had incomplete data, we did not include them in the analysis.

D. Samples and Weighting

The complex design of the LSVRSP implies that data from the appropriate cohorts must be used in conducting specific analyses, and appropriate weights must also be used. Most importantly, the analysis of eligibility uses data from the applicant cohort only, because the samples for the recipient and exited cohorts by definition include only persons who were determined to be eligible. For the analysis of outcomes among those determined eligible, we include records from all three cohorts, but exclude those who did not receive services.

For descriptive statistics, we adopted the convention of reporting missing values along with other categories. For multivariate analyses, however, we dropped observations with incomplete data for one or more of the relevant variables. This causes some differences between the descriptive statistics reported and the corresponding statistics from the samples for the multivariate analysis. In general, these discrepancies are small and inconsequential for the findings. There are, however, two important exceptions. First, the LSVRSP does not include extensive data on employment outcomes at closure for clients who were served but closed as not rehabilitated (status 28), apparently because administrative records provided little information on these outcomes. These clients were included in a post-closure follow-up survey, and many were employed at the time of that survey, which suggests that many might also have been employed at closure. That is, the number of served clients who are employed at closure might be substantially higher than the number who were both rehabilitated and employed. Because of this limitation in the data, we confine attention to those who were closed as rehabilitated (status 26) whenever we make comparisons of employment at closure and follow-up, and report separate employment statistics at follow-up for all served clients.

Second, attrition from the study means that the sample available for analysis of follow-up employment is smaller than the sample available for analysis of employment at closure. Comparison of employment statistics at closure for the sample of rehabilitated clients with complete follow-up data to corresponding statistics for all those with

complete data at closure revealed that those with follow-up data had better employment outcomes at closure than those without follow-up data. Hence, we adjust outcome estimates at follow-up for attrition bias, based on comparison of statistics for these two samples at closure. The adjustment is described in Section 7.

E. Hierarchical Modeling

As indicated earlier, we consider differences in outcomes at each major stage of the VR process from eligibility determination through approximately 12 months after closure. The initial analysis of these differences is hierarchical. That is, we first analyze eligibility, then analyze service receipt conditional on eligibility receipt, then analyze rehabilitation at closure and follow-up employment conditional on service receipt. There is also hierarchical modeling within the closure and follow-up stages. At closure, we model paid and competitive employment conditional on rehabilitation, and then model characteristics of paid jobs conditional on paid employment. Analogous models are estimated at follow-up. We also analyze two employment outcomes over a 15 month period that begins three months before closure, conditional on service receipt.

For each analysis, we examine differences between beneficiary and non-beneficiary outcomes, conditional on each having reached that stage. For instance, we consider the difference in the percentage with paid jobs at closure, conditional on having been closed as rehabilitated. Because we are using hierarchical modeling, our analysis isolates the relationship between beneficiary status and obtaining paid employment once rehabilitated. The results show that differences in the first two stages – through being served – are small, although significant. After that, though, there are more substantial differences at every stage, before and after controlling for other characteristics at application. Differences in outcomes for the conditional analyses at latter stages therefore understate, substantially, differences in outcome for all beneficiary and non-beneficiary clients because they ignore the cumulative effects of differences at earlier stages. Most of the discussion in the body of the paper focuses on the conditional models at the various stages in the hierarchy. In the concluding section, we translate these findings into cumulative differences for all beneficiary and non-beneficiary clients, before and after adjustment for beneficiary characteristics.

F. Adjustment for differences in characteristics at Application

Much of the paper is concerned with comparing differences in outcomes for beneficiaries and non-beneficiaries before and after adjusting for differences in their characteristics at application. We use multivariate analysis methods for this purpose. Two types of multivariate models are used: regression and logit (i.e., logistic regression). Regression is used to analyze the differences in means for continuous outcomes, and logit is used to analyze differences in percentages for categorical (binomial) outcomes. Each of these models include beneficiary status at application as the key explanatory, or "independent" variable, plus a long list of other characteristics

Estimated regression models can be used in a straightforward manner to decompose the difference between the means of the outcome ("dependent") variable for beneficiaries and non-beneficiaries into differences accounted for by the independent variables other than beneficiary status and residual differences accounted for by beneficiary status (also an independent variable). The method takes advantage of these two features of regression: a) each independent variable's coefficient can be interpreted as the change in the mean of the dependent variable per unit change in the independent variable, holding the other independent variables constant, and b) the coefficient multiplied by the difference in the variable's means for the two samples can be interpreted as the difference in the dependent variable's mean that is accounted for by that independent variable, holding the other independent variables constant. Further, when the contributions of each independent variable, computed in this fashion, are added together, the sum is exactly equal to the difference in means for the dependent variable.

The decomposition method for logit models is slightly more complex because, unlike multiple regression models, the logit model involves a non-linear relationship

between the dependent (categorical) variable and the independent variables.[10] The findings, however can be interpreted in the same way; i.e. we decompose the difference in percentages into the difference accounted for by characteristics other than beneficiary status, holding beneficiary status constant, and the difference due to beneficiary status, holding the other independent variables constant.

3. Applicant Characteristics

We estimate that just over one quarter (26.3 percent) of the applicants for VR services were beneficiaries at the time they applied. As discussed below, comparison of the medical and non-medical characteristics of the two applicant groups makes it clear that beneficiary applicants face significantly greater challenges to working, on average, than non-beneficiary applicants.

A. Disability Variables

The data on disability show that, on the whole, beneficiary applicants have substantially more challenging physical or mental conditions than non-beneficiary applicants (Exhibit 3.1). The broad measure of disability severity shows that an estimated

[10] For the logit model, each observation's dependent variable takes on one of two values (zero or one), to represent the two possible categories. The mean of these values from a sample is the percentage of observations with in the category that is assigned a one. The logit model specifies that the logarithm of the "odds ratio" of the categorical outcome variable (the "logit") has a linear relationship with the independent variables, where the odds ratio is the (unobserved) probability that the outcome is one divided by the probability that it is zero. The decomposition methodology for the logit models proceeds as follows. First, we use the logit estimate for each independent variable's coefficient and the difference between the variable's means for beneficiaries and non-beneficiaries to estimate the contribution of the variable's difference in means to the difference in the mean values of the logits for beneficiaries and non-beneficiaries, holding other independent variables constant. The logits and the means of the logits are not observed, but the sum of the contributions of all independent variables to the difference in means of the logits can be interpreted as an estimate of the difference in the means of the logits. Hence, we can compute the share of each independent variable's contribution to the difference in the means of the logits. The last step is to compute each independent variable's contribution to the difference in percentages for the dependent variable by multiplying the actual difference by the share of the difference in mean logits that is accounted for by the same variable. By construction, the differences accounted for by the independent variables will sum to the total difference in percentages.

1.6 percent of beneficiary applicants were in the most severely disabled category, compared to just 20.5 percent for non-beneficiary applicants. Only 6.7 percent of the beneficiary applicants were in the "non-severe" group, versus 24.2 percent of the non-beneficiary applicants. The functional status variables show that the share of beneficiary applicants with low functional status in each of the three areas measured is substantially higher than the corresponding share for non-beneficiary applicants. A larger share of the beneficiary applicants has also had their medical condition since birth (27.5 percent versus 20.1 percent).

The VR data on the primary cause of disability show that the mix of medical conditions for beneficiary applicants is quite different than that for non-beneficiary applicants, in ways that suggest both greater severity and lower likelihood of medical improvement. Beneficiary applicants are much less likely than others to have an orthopedic impairment, including amputation (19.6 percent versus 30.0 percent), but are much more likely to be in the "3+ limbs/entire body" subcategory (5.4 percent versus 2.6 percent) – the subcategory that likely includes those with the most challenging orthopedic conditions. We do not find statistically significant differences between orthopedic impairments by cause except for "other accidents, injuries and poisonings." In fact, it appears that the higher prevalence of orthopedic impairments among non-beneficiary applicants is entirely due to a higher prevalence of orthopedic impairments that are due to this cause. Compared to other causes, which include congenital conditions, several chronic diseases, intracranial hemorrhage/stroke and spinal chord injuries, such impairments are likely to be less permanent in nature.

Beneficiary applicants are more likely than others to be classified in a mental illness or substance abuse category (34.1 percent versus 28.1 percent). The difference is larger if the substance abuse category is omitted (30.2 percent versus 18.8 percent). Significantly larger shares of beneficiary applicants than other applicants have what are commonly regarded as the most severe mental illnesses: schizophrenia/paranoia, psychoses other than psychotic depression, and manic depression.

Beneficiary applicants are also more likely than others to be classified as having mental retardation (13.1 percent versus 4.9 percent), and are somewhat more likely to have a traumatic brain injury (4.7 versus 2.2 percent). Although such applicants might

well obtain employment, we would expect the earnings of those who do to be relatively low. Beneficiary applicants are also significantly more likely than others to have vision impairments (7.6 percent versus 3.5 percent). Non-beneficiary applicants are much more likely than beneficiary applicants to have a learning disability (10.2 percent versus 3.8 percent).

B. Demographic Characteristics

Other characteristics of beneficiary applicants are also quite different than those of non-beneficiary applicants. Some of the differences in other characteristics might be explained by differences in medical conditions, but other causes might also be important. Many, but not all, of the differences would lead us to expect less successful work outcomes for beneficiary clients than for others.

Turning first to demographic variables (Exhibit 3.2), beneficiary applicants are, on average, somewhat older than non-beneficiary applicants. They are substantially more likely to be black (23.2 percent versus 14.3 percent), and substantially likely to be Hispanic (6.7 percent versus 10.7 percent). Beneficiary applicants are much less likely than others to be married, almost entirely because more have never been married (55.4 percent versus 44.0 percent), despite the fact that they tend to be older. They are also less likely to have dependents (59.7 percent have no dependents versus 49.1 percent for others). Although large majorities of both groups live in private residences, the share in other living situations is substantially higher for beneficiary applicants than for others (9.5 percent versus 5.4 percent). The difference is due to the larger share of beneficiary applicants who live in supported living facilities (7.1 percent versus 2.5 percent for other applicants).

C. Education, Training and Work Experience

Beneficiary applicants reported substantially less previous education and training than non-beneficiary applicants. To avoid what would likely be inappropriate comparisons of educational attainment for those who received some special education and those who did not, we focus on attainment by special education status (Exhibit 3.3). Beneficiary applicants were more likely to report special education receipt than non-

beneficiary applicants (21.3 percent versus 15.3 percent). They were also less likely to report no special education and attainment of at least a high school degree (40.3 percent versus 50.5 percent), although they were about equally likely to have no special education and a higher degree of some sort. Beneficiary applicants were also somewhat less likely than non-beneficiary applicants to be students at the time of application (11.5 percent versus 13.9 percent). A relatively large share of beneficiary applicants had a prior VR closure (18.7 percent versus 11.5 percent for others), and 4.6 percent had had at least two prior VR closures, compared to 1.2 percent for others.

Beneficiary applicants also reported much less work experience than non-applicants at the time of application – another reason to expect less employment success at closure (Exhibit 3.4). Many more non-beneficiary applicants than beneficiary applicants were working at the time of application (31.7 percent versus 17.0 percent). Slightly more had also worked for at least a year prior to disability onset (44.2 percent versus 42.2 percent), and after onset (58.6 percent versus 44.9 percent). Further, among those who had worked in the 24 months prior to VR application, non-beneficiary applicants typically had higher wages than beneficiary applicants.[11] For example, 76.3 percent of non-beneficiary applicants reported that they earned at least $5.00 per hour, compared to 62.3 percent of beneficiary applicants; the corresponding numbers reporting wages of at least $10 per hour are 25.1 percent and 15.9 percent.

D. Financial Assistance

The hypothesis that beneficiary applicants have less of an incentive to work than non-beneficiary applicants assumes that non-beneficiary applicants are not receiving comparable assistance that is also contingent on earnings. This assumption is confirmed from the data, but we also find that 28.1 percent of non-beneficiary applicants did report some type of financial assistance at the time of application, including significant numbers with assistance from sources that are known to be contingent on earnings (e.g., AFDC, workers' compensation, and private disability insurance). It seems reasonable to conclude, however, that, on the whole, beneficiary applicants for VR services do have

[11] The wage statistics are for the last job held in the 24-month period.

less of a financial incentive to work than non-beneficiary applicants because of the assistance they receive, other things equal.

4. Eligibility and Service receipt

Beneficiary applicants were somewhat more likely to be found eligible for benefits than non-beneficiary applicants. The point estimate for the share found eligible is 4.9 percentage points higher for beneficiaries than for non-beneficiaries (Exhibit 4.1). In the sample with complete data on characteristics at application, however, the difference is much smaller (1.7 percentage points) and the percentage found eligible is larger for both beneficiaries and non-beneficiaries. Note that, for both beneficiaries and non-beneficiaries, the percentage determined eligible is substantially higher for those with complete data than for those without, indicating a strong relationship between incomplete data and eligibility. It appears that many applicants both fail to complete the application process and fail to supply some of the administrative data that is captured by the LSVRSP.

After controlling for other characteristics at application using the sample with complete data, the difference declines further, to 1.3 percentage points. The disability variables alone, and especially the severity variable, account for more than the unadjusted difference in percentages before adjustment, but their effects on the difference are substantially offset by the effects of the experience variables (Exhibit 4.2, left column).

Among those determined eligible, however, beneficiary clients are less likely than others to receive services (82.8 percent versus 87.0 percent). Adjustment for beneficiary characteristics increases the difference slightly (Exhibit 4.1) – a finding that runs counter to the findings for all other outcome variables we have considered. The reason is mostly due to differences in disability characteristics. That is, holding other things constant, the VR agencies were more likely to provide services to eligible clients with disability characteristics similar to those of beneficiary clients than those of non-beneficiary clients. All together, differences in disability characteristics increase the likelihood that beneficiaries determined eligible will receive services by 2.2 percentage points relative to non-beneficiaries. The multivariate analysis indicates that differences in the work experience variables increase the difference in percentage served by 2.0 percentage

points, but this increase is almost entirely offset by the effects of differences in the disability variables (Exhibit 4.2, second column). Differences in education also increase the difference in the percentage of non-beneficiaries served relative to beneficiaries.

The findings are consistent with the hypothesis that the VR agencies are most likely to follow up with those who face the most difficult medical challenges, once an applicant is determined to be eligible. Another hypothesis is that those eligible clients with the least challenging medical conditions are more likely to stop seeking services because of other opportunities that become available to them before service delivery starts. The composite category schizophrenia/ paranoia/other psychoses appears to be an exception to both hypotheses. A plausible explanation of this exception is that the nature of these conditions reduces the chance that the client follows through with obtaining services. It might also be, however, that the VR agencies are less well prepared to provide services to such clients than they are to others.

5. Rehabilitation Status at Closure

The VR agencies closed 58.2 percent of those beneficiaries who received services (closure status 26 or 28) as rehabilitated (status 26). The same percentage for non-beneficiary clients was substantially higher: 70.4 percent (Exhibit 5.1). The difference is somewhat larger in the sample with complete data on characteristics at application (13.7 percent versus 12.2 percent). We found that only one quarter of this difference (3.0 percentage points) could be accounted for by differences in other characteristics at application.

Several characteristics substantially reduce the percentage rehabilitated for beneficiary clients relative to non-beneficiary clients, but these are partially offset by the effects of others (Exhibit 5.2). The most important of the former is employment experience, especially post-disability experience. The latter variable is a strong, positive predictor of rehabilitation, and the percentage of served beneficiary clients with such post-disability employment experience is much lower than for others (66.2 versus 77.1 percent).[12] Our estimates indicate that this factor alone would account for a difference in

[12] Logistic regression results and means for the rehabilitation analysis are reported in Appendix A.3.

the percentage rehabilitated of 2.8 percentage points. Another work experience variable that accounts for a substantial share of the lower rehabilitation rate for beneficiary clients is previous VR closure. Clients with at least one prior closure are less likely to be rehabilitated at closure than those who have none, holding other things constant, and a much larger share of beneficiary clients than non-beneficiary clients have received services previously (27.1 versus 14.4 percent). We estimate that this difference increases the difference in the percentage rehabilitated by 0.7 percentage points. Other measures of previous employment and main activity at time of application have significant effects. In general, the more previous employment, the more likely is rehabilitation at closure, and beneficiary clients have less previous employment, on average, than others. Combined, all measures of employment and other activity at the time of application account for 4.9 percentage points of the difference in the percentage rehabilitated at closure.

Differences in marital status and race also help account for the difference in the percentage rehabilitated. Married clients are more likely than others to be rehabilitated at closure, holding other things constant, and beneficiary clients are less likely to be married than non-beneficiary clients. We estimate that the difference in percentage married increases the difference in the percentage rehabilitated by 1.0 percentage points. African-Americans are less likely to be rehabilitated at closure, other things constant, and the share of beneficiary clients in this racial category is larger than the share of non-beneficiary clients. The estimated effect is to increase the difference in the percentage rehabilitated by 0.3 percentage points.

Differences in means for some other characteristics at application partially offset the effects of those discussed above; that is, they increase the percentage rehabilitated for beneficiary clients relative to others. Most importantly, the net effect of differences in the disability variables is to increase the percentage of beneficiary clients rehabilitated by an estimated 2.5 percentage points.

The main source of this positive effect is condition type. Rehabilitation status at closure varies significantly by condition type, holding other things (including acquired/congenital and severity rating) constant. The following list is a ranking of the 14 condition categories we used, from the condition with the highest likelihood of rehabilitation at closure to the condition with the lowest, other things constant: vision

impairment; hearing impairment; mental retardation; orthopedic condition impairment involving three or more limbs; orthopedic injury other than spinal chord; non-orthopedic physical; substance abuse; psychotic or bipolar depression; other orthopedic; schizophrenia, paranoia, or other psychosis; spinal chord injury; neurosis; other mental illness; learning disability; and Traumatic Brain Injury (TBI). We estimate that the likelihood of rehabilitation at closure for a client in the highest probability category (vision impairment) is 40.5 percentage points higher than for a client in the lowest probability category (TBI), other things constant.

There are substantial differences in the condition type distributions for beneficiary and non-beneficiary clients. These differences increase the percentage rehabilitated for beneficiary clients relative to non-beneficiary clients. We estimate the following specific contributions (value in parentheses is the estimated effect): a) the relatively large number of beneficiary clients with vision impairments (1.1 percentage points) and mental retardation (1.1 percentage points), both of which rank very high in the above list; and b) the relatively large number of non-beneficiary clients with learning disabilities (1.3 percentage points), which ranks near the bottom. Categories that diminish the likelihood of rehabilitation for beneficiary clients relative to non-beneficiary clients include: hearing impairment (-0.4 percentage points), which is predictive of relatively high percentage rehabilitated, is found less frequently for beneficiary clients than for non-beneficiary clients; schizophrenia, paranoia, and other psychosis (-0.4 percentage points) which is predictive of relatively low percentage rehabilitated and relatively more frequent for beneficiary clients; and TBI (-0.2 percentage points), which is predictive of relatively low percentage rehabilitated and is relatively frequent for beneficiary clients. Holding the other disability variables constant, differences in disability type increase the percentage rehabilitated for beneficiaries relative to non-beneficiaries by 2.7 percentage points.

Differences in means for the two other disability variables (acquired versus congenital, and severity) partly offset the effects of condition type. Other things constant, those with congenital conditions are more likely to be rehabilitated at closure than those with acquired conditions, and relatively more beneficiary clients have congenital conditions; the size of the effect is 0.5 percentage points. At the same time, however, the more severe an individual’s medical condition, the less likely they are to be rehabilitated

at closure, other things constant, and beneficiaries' conditions are rated as more severe, on average. The size of the effect is -0.7 percentage points, making the net effect of these two disability variables -0.2 percentage points.

On net, educational status also increases the percentage for beneficiaries rehabilitated relative to non-beneficiaries, by 0.4 percentage points. The results are difficult to interpret, however, because of the interaction between level attained and special education. Those with a high school degree but no college degree and no special education are less likely to be rehabilitated at closure than others, and those with special education are more likely to be rehabilitated than others, holding level of education constant.

Age differences also increase the percentage of beneficiaries rehabilitated at closure relative to non-beneficiaries, by an estimated 0.2 percentage points. Those age 22 to 29 are more likely to be rehabilitated at closure, other things constant, and beneficiary clients are more likely to be in this age group than others. This is somewhat offset by the fact that relatively more beneficiary clients are in the two oldest age groups (50–59 and 60–64), and clients in these age groups are the least likely to be rehabilitated at closure, other things constant.

Differences in Hispanic ethnicity also increase the percentage rehabilitated for beneficiary clients relative to non-beneficiary clients, by an estimated 0.2 percentage points. Relative to non-Hispanics, Hispanics are less likely to be rehabilitated at closure, other things constant, and there are relatively fewer Hispanics among beneficiary clients than among other clients.

6. Closure Job Characteristics

A. Descriptive Statistics

In this section we focus on the employment of clients whose cases were closed as rehabilitated (status 26). It is important to note first, however, that some clients who were served but whose cases were closed as not-rehabilitated (status 28) were also employed at closure. This sometimes happens, for instance, when a client stops cooperating or cannot be contacted. Unfortunately, the LSVRSP has little information about employment at

closure for such individuals. As will be seen in the next section, findings from the follow-up survey, which does collect information on employment for status 28 closures, suggests that the employment activity of the not-rehabilitated group might be substantial.

We found that the jobs at closure held by successfully rehabilitated beneficiary clients are much less remunerative than those held by rehabilitated non-beneficiary clients. While 84.1 percent of rehabilitated non-beneficiary clients were reported to have competitive jobs or be self employed, only 59.4 percent of rehabilitated beneficiary clients were in one of these categories (Exhibit 6.1). Significantly larger shares of rehabilitated beneficiary clients were reported to be in sheltered workshops, supported employment, or unpaid family/homemaker positions.

We conducted additional analysis of job characteristics for the sub-sample of rehabilitated clients with paid jobs who also had completed the closure job component of the survey (Exhibit 6.2). For this group, beneficiary clients were working many fewer hours per week on average (26.5 versus 35.8 hours) and had substantially lower average hourly wages ($6.56 versus $9.12, after adjustment for inflation) than non-beneficiary clients. As a result, mean earnings per month for non-beneficiaries were much higher than for beneficiaries ($1,455 versus $801, after adjustment for inflation).

The substantial gainful activity (SGA) level of earnings, as defined by SSA, is a critical earnings value for beneficiary clients because earnings above that amount can trigger an SSA review of medical eligibility for benefits. For SSDI beneficiaries, earnings above SGA for more than nine months (the Trial Work Period) would very likely mean loss of all benefits.[13] During the survey period, SGA was set at $500 per month (not inflation adjusted) for all beneficiaries except blind beneficiaries; SGA for the latter, which is adjusted for inflation, was over $900 for all of the relevant period. Of rehabilitated beneficiaries with earnings, less than half (45.5 percent) reported monthly earnings above SGA at closure, compared to 81.6 percent for non-beneficiaries.

[13] During the study period, months with earnings above $350 (after any disregards) were counted toward the TWP; i.e. it was not necessary to earn above SGA ($500) to use up a TWP month. Once the TWP months were exhausted, however, benefits would terminate only if monthly earnings net of disregards exceeded SGA.

We also found that rehabilitated beneficiary clients with paid jobs were significantly less likely than their non-beneficiary counterparts to be in professional occupations, and more likely to have service or bench work jobs.

Regardless of beneficiary status, most rehabilitated clients with paid jobs did not have employer health insurance, and beneficiary clients are only about half as likely as non-beneficiary clients to have reported employer-provided insurance (16.9 percent versus 33.8 percent).

B. Multivariate Analysis

We conducted multivariate analyses to determine the extent to which the large differences between key closure job characteristics for rehabilitated beneficiary and non-beneficiary clients could be accounted for by characteristics observed at application other than beneficiary status. In the first stage of this analysis, we estimated models for whether the closure job is competitive (including self-employed), and whether the job is paid (left-hand side of Exhibit 6.3). In the second stage, we considered those with paid jobs only and estimated models for: hourly earnings, hours worked, monthly earnings, employer health insurance, earnings above SGA, and professional, managerial or technical (PMT) occupation.

For rehabilitated clients with complete data on applicant characteristics, the percentage of non-beneficiary clients placed in competitive jobs or self employment is 24.4 percentage points higher than for beneficiary clients (Exhibit 6.3, left-hand panel). A substantial share of this difference is due to differences in other applicant characteristics. The disability variables account for 10.3 percentage points of the difference, including 7.2 for disability type and 2.5 for severity. After adjusting for these and other applicant characteristics, the remaining difference is 10.1 percentage points – a substantial figure, even though it is less than half of the difference before adjustment.

For this same group, we found that the difference between the percentage with paid employment is small before adjustment (2.8 percentage points lower for beneficiaries), and all of this relatively small difference can be explained by differences in other characteristics. Differences in disability characteristics account for a 6.5 percentage point difference, differences in employment experience account for another

2.1 percentage points. These are partially offset by differences in other characteristics, especially living in other than a private residence (-5.9 percentage points) .

For those rehabilitated clients who work for pay, characteristics at application other than beneficiary status explain a substantial share of the differences between mean hourly wages, hours worked, and monthly earnings, but substantial differences remain after controlling for those characteristics (Exhibit 6.3, middle panel). Differences in the disability variables account for a substantial shares of the unadjusted differences. Smaller shares are accounted for by work experience, marital status and education. More specifically :

- Mean hourly wages for the beneficiaries are 36.4 percent lower than for the non-beneficiaries before controlling for other characteristics, and 19.4 percent lower afterward. The disability variables account for 7.9 percentage points of the unadjusted difference.

- Mean hours worked for beneficiaries are 37.3 percent lower than for non-beneficiaries before controlling for other characteristics, and 26.2 percentage points lower afterward. The disability variables account for 7.9 percentage points of the unadjusted difference.

- Mean monthly earnings for the beneficiaries are 73.7 percent lower than for the non-beneficiaries before controlling for other characteristics, and 45.6 percent lower afterward. These differences reflect the sum of the differences for hour wages and hours worked.[14]

We also found that other characteristics at application, especially the disability variables, explained substantial shares of the differences between rehabilitated beneficiaries and non-beneficiaries with paid jobs for the three categorical variables we examined – employer health insurance, earnings above SGA, and PMT occupation (right-hand panel of Exhibit 6.3). Before adjustments, the differences for these variables are all

[14] The percentage difference in mean monthly earnings explained by each variable would be identically equal to the sum of the corresponding figures for hours worked and hourly earnings were it not for small differences in the samples used to calculate the three sets of estimates.

large (22.2, 41.5 and 11.7 percentage points, respectively). For both health insurance and earnings above SGA, substantial estimated differences remain after controlling for other characteristics (12.9 and 25.1 percentage points, respectively), but for PMT occupation the remaining difference is small (1.6 percentage points).

7. Employment at Follow-up

A. Paid and Competitive Employment

In this section we examine the follow-up employment status of clients who received services (26 and 28 closures). We first consider two outcomes, paid employment and competitive employment. We then consider job characteristics for those with paid employment.

Comparisons of employment outcomes at follow-up to employment outcomes at closure are interesting, but are complicated by two data problems. The first is the lack of comparable employment data at closure for those who receive services but are not rehabilitated (28 closures). That is, we can observe paid employment and competitive employment at follow-up for both status 26 and status 28 closures, but employment characteristics for paid jobs at closure was only collected for those with status 26 closures. To address this issue, we consider both a) the joint outcomes "rehabilitated (at closure) and paid employment (at follow-up)," and "rehabilitated and competitive employment" for all clients served, which can be observed at both closure and follow-up, and b) the percentages in "paid employment" and "competitive employment" at follow-up for all status 26 and 28 cases.

The second problem is attrition bias – not all respondents to the closure survey also responded to the follow-up survey, and we found that those who responded were more likely to be in paid or competitive employment at closure than those who did not. To address this issue, we recomputed the two joint outcomes at closure using just the sample with follow-up data, then used the difference between this result and the result obtained using the larger sample for those with complete data at closure to adjust the follow-up results for attrition bias.

The top panel of Exhibit 7.1 presents the findings for paid employment. The first important finding is that substantial numbers of both beneficiaries and non-beneficiaries who received services but were closed as not rehabilitated had paid jobs at follow-up. For beneficiaries, this can be seen by comparing the 53.3 percent of the served clients with complete data who had paid jobs at follow-up to the 47.7 percent who had paid jobs and had been closed as rehabilitated. The corresponding figures for non-beneficiaries are 69.8 percent and 61.8 percent. The findings presented in the next paragraph make it likely that paid employment at follow-up of those closed as not rehabilitated reflects unobserved employment at closure, rather than jobs obtained after closure.

The next finding is that there is a substantial decline in paid employment among both beneficiaries and non-beneficiaries closed as rehabilitated from closure to follow-up. For served beneficiary clients with complete follow-up data, 57.9 percent were closed as rehabilitated and had paid jobs at closure; this figure declines to 47.7 percent at follow-up. The corresponding figures for non-beneficiaries are 72.9 percent and 61.8 percent.

As indicated earlier, there is evidence of attrition bias, for both beneficiaries and non-beneficiaries. For both groups, the percentage rehabilitated and having paid jobs at closure is several points higher in the sample with complete data (i.e., at application, closure and follow-up) than in the larger sample that includes observations with incomplete follow-up data (57.9 percent versus 53.4 percent for beneficiaries and 72.9 percent versus 68.3 percent for non-beneficiaries). We adjust the beneficiary and non-beneficiary estimate for percentage rehabilitated and paid at follow-up by the ratio of the second figure in the relevant pair to the first. The same ratios are applied to the estimates of percentage paid at follow-up.[15] The attrition adjustments have very little effect on the differences between beneficiary and non-beneficiary estimates.

We also conducted a logit analysis of paid employment at follow-up for those served (including those not rehabilitated) to assess the extent to which the difference between the percentages for beneficiaries and non-beneficiaries would remain after accounting for other characteristics at application. Of the 16.5 percentage point difference (before adjustment for attrition), 7.5 percentage points (somewhat less than half) remains

[15] For example, for beneficiaries the adjusted estimate for percentage paid is 49.2 = 53.3 x 53.4/57.9.

after controlling for other characteristics at application. The characteristics accounting for substantial shares of the difference are similar to those that account for differences in the percentages of beneficiary and non-beneficiary rehabilitated clients with paid work at closure (compare the first column of Exhibit 7.2 to the second column of Exhibit 6.3). After adjusting the percentage of served non-beneficiary clients with paid follow-up employment for differences in characteristics at application, we further adjust it for attrition, applying the same factor as for the percentage of served non-beneficiary clients with paid follow-up employment. After adjustment for both factors, the difference in the percentage with paid follow-up employment is 7.7 percentage points.

The lower half of Exhibit 7.1 contains the analogous analysis for competitive employment and the second column of Exhibit 7.2 contains the corresponding logit analysis for this outcome. Findings are qualitatively similar to those for paid employment at follow-up. As at closure, the difference in percentages for competitive employment at follow-up is larger than for paid employment, reflecting relatively large numbers of beneficiary clients placed in supported or sheltered jobs. After adjustment for attrition bias, the difference in the percentage in competitive employment is 26.9 percentage points, and adjustment for characteristics at application reduces the difference to 15.6 percentage points.

B. Characteristics of Paid Employment

For served clients employed in paid positions at follow-up, there are large differences between beneficiary and non-beneficiary mean job characteristics at follow-up, always in favor of non-beneficiaries (Exhibit 7.3). Differences are larger than for the corresponding characteristics for paid jobs at closure, but they are not directly comparable because statistics for paid employment at follow-up include jobs held by some beneficiaries who were served but were closed as not rehabilitated, in contrast to the statistics for paid employment at closure; They might also be affected by attrition bias.

To assess the extent to which these two factors contribute to the larger differences at follow-up, we present a comparison of characteristics for paid jobs at closure and

follow-up that takes these differences into account (Exhibit 7.4). The analysis presented is parallel to the analysis for paid and competitive employment presented in Exhibit 7.2.

Attrition bias is apparently not as substantial as it is for the percentages with paid or competitive employment, but for four of the variables the bias for beneficiaries is opposite in sign of that for non-beneficiaries (hourly wages, hours per week, monthly earning, and earnings above SGA). As a result, the adjustments for attrition bias somewhat reduce the differences in characteristics for paid jobs at follow-up. After adjustment for attrition and for differences in characteristics at application, we estimate that hourly earnings at follow-up for beneficiary clients with paid jobs were 25.2 percent lower than for the corresponding non-beneficiary clients, hours worked were 26.9 percent lower, and monthly earnings were 52.0 percent lower. The analogously adjusted difference in percentage with employer health insurance is 19.3 percentage points, the difference in percentage with earnings above SGA is 17.9 percentage points, and the difference in percentage with PMT jobs is 3.4 percentage points.

For rehabilitated clients with complete data, the logarithmic means of hourly earnings, hours per week, and monthly earnings at follow-up are slightly higher than the corresponding values at closure, for both beneficiaries and non-beneficiaries. For the same sample we also see substantial increases in the percentage with health insurance, earnings above SGA, and PMT occupations, for both beneficiaries and non-beneficiaries, except the increase in the percentage with earnings above SGA is observed only for beneficiaries.

Mean follow-up job characteristics for all served clients with paid jobs (including those closed as not rehabilitated) are very close to those for rehabilitated clients with paid jobs only. After adjustment for attrition bias, we find that, for served clients with paid jobs at follow-up:

- Mean hourly earnings were 45.3 percent lower for beneficiaries than for non-beneficiaries, before adjustment for characteristics at application; after adjustment, the difference is lower, but still high, at 25.2 percent.

- On average, beneficiaries worked fewer hours per week: 37.6 percent fewer before adjustment for characteristics at application, and 26.9 percent after adjustment.

- The percent difference in mean monthly earnings is 82.9 percent, before adjustment for characteristics at application, and 52.0 percent after adjustment.

- The percentage of beneficiaries in paid jobs who have health insurance is 23.8 percentage points below the corresponding figure for non-beneficiaries before adjustment for characteristics at application, and 19.3 percentage points lower after adjustment.

- The percentage of beneficiaries in paid jobs who have earnings above SGA is 34.8 percentage points below the corresponding figure for non-beneficiaries before adjustment for characteristics at application, and 17.9 percentage points below after adjustment.

- The percentage of beneficiaries in paid jobs who have professional, managerial or technical (PMT) occupations is 10.9 percentage points below the corresponding percentage for non-beneficiaries before adjustment for characteristics at application, and 3.4 percentage points after adjustment.

In Exhibit 7.5 we show the extent to which differences in client characteristics at application account for differences between paid job characteristics at follow-up. For each job characteristic, the disability variables account for a substantial share of the difference in outcomes – especially the disability type variables. For monthly earnings, for instance, the disability variables together account for 12.5 percentage points of the difference, including 10.5 percentage points accounted for by disability type.

8. Paid Employment and Earnings over 15 Months

The analysis of the previous two sections examines client employment outcomes at two points in time: closure and follow-up (approximately 12 months after closure). In this section, we consider two employment outcomes over the 15 month period that begins in the second month before the closure month and ends in the 12th month after the closure month: number of months with paid employment, and number of months with earnings above SGA. The reason for the latter analysis is indicated in the introduction: SSDI beneficiaries lose their benefits if they achieve earnings above the SGA level for

nine months unless they have disregards for certain expenditures. Hence, it is interesting to consider the extent to which beneficiary clients in the sample made progress toward nine months of earnings above SGA, and to compare their progress toward that of non-beneficiaries.

Unfortunately, the data do not provide adequate information to determine employment status or earnings relative to SGA in each month during this period, even for those with follow-up interviews. As indicated earlier, the closure employment data for served clients closed as not rehabilitated is very limited. In some cases the follow-up interview occurred before the end of the 15-month period. In other cases, changes in employment or earnings occurred between the exit month and the follow-up interview that were not captured by the study instruments.

To compensate for these limitations, the analysis in this section considers the relationship between the outcome of interest (e.g., months of employment) and number of months for which we observe the outcome during the 15-month period. Further, we only consider outcomes for clients who were closed as rehabilitated (status 26) and who responded to the follow-up survey. For such respondents, we were able to determine employment status and earnings relative to SGA for at least 9 months in 87.8 percent of cases all; beneficiary status did not significantly affect the likelihood of observing these outcomes. We are able to observe these outcomes for 15 months for 37.4 percent of these clients, and again there is no significant difference in the percentage observed by beneficiary status.

Holding months observed constant, mean months worked for beneficiary clients closed as rehabilitated is usually below that for non-beneficiary clients (Exhibit 8.1), although there is considerable variation in the difference with number of months observed because of the small sample sizes at each number. For those observed from 13 to 15 months there is clearly a significant difference between the percentage for beneficiaries and non-beneficiaries, but the difference is just half a month for the large number of respondents that we can observe for a full 15 months.

Our estimates for the percentage with earnings above SGA for at least nine months (Exhibit 8.2) are adjusted for attrition bias, based on the adjustment applied to the estimates for the percentages of rehabilitated clients with paid jobs who have earnings

above SGA at follow-up.[16] The estimated percentages of rehabilitated non-beneficiary clients with earnings above SGA for at least nine months are substantial after nine months and, apart from sampling variation, increase through 15 months. For those observed for 15 months the estimate is 83.0 percent. The corresponding estimates for rehabilitated beneficiary clients are roughly half as large; the estimate at 15 months is 42.2 percent, 40.8 percentage points below the value for non-beneficiaries.

We also conducted a logit analysis of earnings above SGA for nine or more months to assess the extent to which differences between beneficiaries and non-beneficiaries can be accounted for by differences in characteristics at application, again confining our attention to clients with complete data who were closed as rehabilitated. We included in the sample only those for whom we can determine earnings relative to SGA for at least nine months, and also included the number of months for which we could observe this outcome as an explanatory variable (see Appendix Exhibit 6.1).

The model yields estimates of the percentages of rehabilitated beneficiaries and non-beneficiaries achieving nine or more months of earnings above SGA in the 15-month period.[17] The estimates, which have been adjusted for attrition, are 39.7 and 74.2 percent, respectively. We estimate that just over half of the 34.5 percentage point difference between the two estimates is accounted for by differences in characteristics at application, leaving a difference of 19.0 percentage points accounted for by beneficiary status.

As indicated earlier, the fact that a respondent has achieved earnings above SGA for nine or more months does not necessarily mean that the respondent has exited the SSDI or SSI programs. It appears, however, that many who have achieved that milestone did exit. In the sample of served clients with complete data at follow-up as well as earlier,

[16] Specifically, we multiplied each month's unadjusted estimate for beneficiaries (non-beneficiaries) by the ratio of the adjusted to unadjusted estimates for the percentage of paid follow-up jobs with earnings above SGA for beneficiaries (non-beneficiaries), using the data for rehabilitated clients only (see Exhibit 7.4).

[17] Technically, the estimates for this percentage vary with the number of months that are observed for the individual in the 15-month period. The estimates reported represent estimates for the average individual in the sample, who was observed for 12.5 months.

25.8 percent reported that they were not receiving benefits at follow-up.[18] This estimate is likely biased upward by a few percentage points due to sample attrition.[19] Even so, it would not be far below the estimated 26.1 percent who reported earnings above SGA at the same point, and would be close to the estimated 22.6 percent of rehabilitated beneficiary clients reporting earnings above SGA for at least nine months – both of which are adjusted for attrition bias. Given these estimates and the fact that SSI recipients can earn somewhat more than SGA and retain some SSI benefits indefinitely, the percentage of served beneficiary clients who are employed and not receiving benefits at follow-up is remarkably high. Unless benefit receipt is substantially misreported, it appears that the percentage of served beneficiary clients who eventually leave the rolls for at least some period because of earnings is at least 20 percent.[20]

9. Summary and Conclusion

We begin by summarizing the findings concerning the differences between outcomes for beneficiary and non-beneficiary applicants at every stage of the VR service process through 12 months after closure, then turn to a discussion of their implications for policy and future research.

First, we consider the percentages of applicants who were determined eligible and who received services (Exhibit 9.1). The base of each of these figures is applicants; each percentage served was calculated by multiplying the corresponding percentage eligible by percentage served for those determined eligible.

During the period when the data were collected, there was no significant difference in the likelihood that beneficiary and non-beneficiary applicants for services would be determined eligible for services. Beneficiary applicants were somewhat less

[18] Another 4.4 percent reported that they were neither working for pay nor receiving benefits.

[19] We cannot assess the extent to which follow-up attrition affects benefit status at follow-up because we do not observe benefit status at closure; even if we did, the adjustment method used for the employment outcomes might not work well because it is likely that many of those earning above SGA at closure were still receiving benefits because of the Trial Work Period and the Section 1619 program.

[20] This includes beneficiary clients who leave the rolls and return to work because of a substantial improvement in their medical condition as well as those who do so despite no substantial improvement.

likely to be served, however, because those found eligible were less likely to actually receive services. Thus, although beneficiary applicants are more likely to be determined eligible, overall they are less likely to be served; 72.6 percent of beneficiary applicants receive services, versus 75.4 percent of non-beneficiary applicants. Controlling for differences in characteristics at application increases the difference in the percentage served, from 2.8 percentage points to 3.6 percentage points.

For the remainder of this section we consider outcomes for those who received services beyond their eligibility determination (i.e., those closed in status 26 or 28). From a policy perspective, those served are of special interest because the services they receive account for most VR agency expenditures. For those served, we found significant and substantial differences between beneficiary and non-beneficiary outcomes at every stage. Although substantial shares of these differences could be explained by differences in other characteristics at application, substantial differences remain after adjusting for those characteristics.

Estimates of key outcomes for beneficiaries and non-beneficiaries, adjusted for attrition bias only, are presented in Exhibit 9.2. Starting from the bottom and moving to the top, the outcomes are:

- The percentage of served clients who are rehabilitated;

- Three measures of the percentage of served clients who obtain paid jobs. The first (lowest) of these is the percentage who are classified as rehabilitated at closure and who have paid jobs.[21] The second (middle) is comparable to the first, but refers to the follow-up job, approximately 12 months after closure. The third (top) is the percentage of all served clients (including clients not rehabilitated) who have paid jobs at follow-up, and is larger than the second because some clients who were not rehabilitated had paid jobs;

- Three measures of the percentage of served clients who obtain competitive jobs – excluding unpaid jobs, sheltered workshop jobs, and supported employment jobs. The three measures are defined analogously to those for paid jobs.

[21] As discussed earlier comparable information for those classified as not rehabilitated is unavailable.

- Four measures of the percentage of served clients who receive earnings above SGA. The lowest three are analogous to the measures for paid and competitive employment. The fourth (top) is the percentage with earnings above SGA for nine or more months out of the 12-month period beginning three months before closure.

As discussed in the previous section, although we do not have definitive data, it appears that the percentage of served beneficiaries who are employed and have exited the benefit rolls at follow-up is just slightly lower than the estimate of the percentage with earnings above SGA at follow-up (i.e., about 20 percent).

Not surprisingly, as we move from the bottom outcome measure to the top, the percentage of each group attaining the outcome generally declines; many clients have medical issues, as well as other personal challenges, that are likely to limit their employment success over long periods. It is also not surprising that attainment of these outcomes is lower for beneficiaries than non-beneficiaries. What is most striking is that the decline from the percentage achieving the lowest outcomes to the percentage achieving the highest outcomes is much greater for beneficiaries than for non-beneficiaries. Whereas the difference in the percentage rehabilitated (bottom outcome) is 13.7 percentage points (56.9 percent for beneficiaries versus 70.6 percent for non-beneficiaries), the difference in the percentage with earnings above SGA for at least 9 months (top outcome) is more than twice as large on a smaller base -- 29.8 percentage points (22.6 percent versus 52.4 percent).

A substantial share of the observed difference in each outcome is accounted for by differences in other client characteristics at application, as shown in Exhibit 9.3 (white sections of the bars), and the amount accounted for in this fashion is generally larger for the outcomes at the top of the list than for the outcomes at the bottom. We find that prior work experience, especially since disability onset, and disability characteristics are the most important contributors to differences in outcomes.

Even after accounting for differences in characteristics at application, we find substantial differences in outcomes, especially for those at the top of the list. Thus, while the remaining difference in the percentage rehabilitated at closure is estimated at 10.7 percentage points, the remaining difference in the percentage with earnings above SGA for at least nine months is 17.1 percentage points.

What accounts for the remaining differences in outcomes? It might be that the characteristics captured by the LSVRSP data, despite their richness relative to characteristics available in other data sets, nonetheless fail to capture important differences between beneficiary and non-beneficiary clients that could account for the remaining differences.

Although we think that unobserved differences in characteristics probably do account for some of the remaining differences, it also seems unlikely that unmeasured characteristics could account for all of the remaining differences for the earnings outcomes.

The leading alternative explanation for the differences in outcomes not accounted for by differences in characteristics at application are the work disincentives associated with the income support programs, including their related health insurance benefits. That explanation is certainly consistent with the finding that the differences not accounted for are largest for the measures relating earnings to SGA. As discussed in the introduction, SSDI beneficiaries have a strong incentive to keep their earnings below SGA, and SSI recipients have a weaker, although significant, incentive to do the same.

The fact that most clients who obtain paid jobs did not obtain jobs with employer health insurance adds credibility to the incentive hypothesis. The difficulty that clients face in obtaining jobs with health insurance substantially increases the incentive for beneficiary clients to maintain their eligibility for benefits. It might also be that beneficiary clients who intend to maintain their eligibility may be more willing than non-beneficiary clients to accept jobs that do not offer health insurance, helping to explain the substantial difference in the percentage of paid jobs with health insurance for beneficiary and non-beneficiary clients with paid jobs at both closure and follow-up.

The differences between beneficiary and non-beneficiary outcomes after controlling for other characteristics at application might also understate, rather than overstate, the potential effect of disincentives on employment outcomes for beneficiaries, because the outcomes for non-beneficiaries might also substantially reflect the effects of work disincentives, for two reasons. First, a substantial number of non-beneficiary clients were receiving income support from other sources that create work disincentives at the time they applied for services. As discussed in Section 3, 28.1 percent of non-beneficiary

clients were receiving support from some public or private source, including 18.9 percent who said that such income was their primary source of support. This group includes 6.7 percent who were receiving AFDC benefits and 3.9 percent who were receiving workers compensation indemnity payments, among others.

Second, some clients who were non-beneficiaries at application for VR services were apparently in the process of obtaining benefits, or entered that process shortly thereafter. We do not have direct information on application activity, but we do know that 14.6 percent of non-beneficiaries who received services and who also responded to the follow-up survey said they were receiving SSDI or SSI benefits at the time of the follow-up survey.[22] During the application process, this group had stronger incentives to conceal their ability to achieve earnings above SGA. Achievement of earnings above SGA during the application period would preclude them from SSDI or SSI eligibility entirely; the SSDI and SSI work incentive provisions only apply to those who have already been found eligible for these programs.

Although our findings leave a substantial role for disincentives created by the SSDI and SSI programs and their associated health benefits in determining employment outcomes for beneficiaries, more empirical research is required to establish that the effect of these disincentives is very substantial. This is a very important issue from a policy perspective, in at least two ways.

First, disincentives might have a very negative impact on the success of VR delivery of services to beneficiaries, and addressing disincentives might greatly improve VR performance. VR agencies have often been criticized for not helping more beneficiaries to become economically independent (i.e., exit the SSDI and SSI rolls). Dissatisfaction with the performance of state VR agencies in this regard was a driving force behind establishment of the Ticket to Work program under the 1999 Ticket to Work and Work Incentives Improvement Act. Ticket to Work adds two payment systems to the previously existing system used by SSA to pay state VR agencies for services provided to beneficiaries, and also makes both new payment systems available to qualified private providers (Employment Networks, or ENs).

[22] This estimate is not adjusted for possible attrition bias. The likely direction of bias is unclear.

These changes were intended to both encourage competition between providers (both VR agencies and ENs) and provide much stronger incentives for providers to help beneficiaries exit the SSDI and SSI programs. The Ticket program is built on the premise that, with financial encouragement, VR agencies and/or the ENs can improve the employment outcomes of beneficiaries who receive VR services by enough so that more will exit the program rolls. If disincentives created by the structure of SSDI and SSI benefits are an important reason for relatively poor outcomes for beneficiary clients, then a) past criticism of VR performance was at least somewhat misplaced because the disincentives are external to VR, and b) VR agencies and ENs might achieve success under the new payment systems by pursuing strategies that address these disincentives.

Although the disincentives are external to VR, providers do have some opportunities to address them, several of which were introduced or expanded under the 1999 Ticket Act. In states that have introduced Medicaid Buy-in programs, providers can help SSDI and SSI beneficiary clients take advantage of the opportunity these programs offer to workers with disabilities. In all states, providers can make clients aware of SSDI and SSI work incentive provisions that allow former beneficiaries to continue receipt of Medicare or Medicaid. Providers can also convert SSA's outcome payments, made under the new payment systems only after clients exit the rolls, into income or in-kind benefits for the client.[23]

In general, helping clients address program disincentives as they return to work is itself a potentially valuable vocational rehabilitation service. The establishment of SSA's Benefits Planning and Outreach Grants (BPAO) program under the Ticket Act recognizes this potential. If it can be established that providing this service does, indeed, increase program exits, given the limited scope for such services under current law, then regulatory and legislative changes that would effectively expand the scope of such

[23] One EN has pursued this strategy as its only service, with some success. This strategy might be especially effect for beneficiaries with relatively low benefits, because outcomes payments do not depend on the size of the individual's benefits; they are fixed at 40 percent of average monthly SSDI for SSDI beneficiaries, or 40 percent of average monthly SSI benefits for SSI recipients who are not SSDI beneficiaries. Others have paid smaller monthly stipends to secure monthly documentation of earnings above SGA. To our knowledge, VR agencies have not used this strategy (see Thornton et al., 2004, p. 108).

services might well be warranted (e.g., increases in the size of outcome payments, increased support for Medicaid Buy-in programs, and removal of restrictions that might prevent providers from passing outcome payments on to clients who leave the rolls in the form of cash or in-kind benefits). If incentives matter, we should also find that the reduction in disincentives that will be tested under SSA's Benefit Offset Demonstration for SSDI beneficiaries will improve employment outcomes for both VR and EN beneficiary clients.[24]

This last point hints at the second policy reason for studying the effects of the disincentives created by the SSDI and SSI programs for beneficiary clients: to assess the possible effects of changes to those disincentives on the employment and earnings of beneficiaries and potential beneficiaries. If we could determine the extent to which post-VR earnings of beneficiary clients are affected by specific reductions in the disincentives, then we could infer the effects of a variety of proposed changes to the disincentives on VR clients. The implications of strong effects would extend well beyond the implications for those who receive VR services under the current system. If the disincentive effects are strong, then reductions in disincentives might have substantial positive effects on the employment and earnings of many beneficiaries (and potential beneficiaries) other than those who would use VR services under our current system. Those are the outcomes that policymakers seek to achieve under the Benefit Offset Demonstration. It remains to be seen whether the changes that will be tested will be sufficient to have a substantial impact. Although the innovation to be tested under the Demonstration reduces disincentives in a substantial way, Demonstration beneficiaries will lose one dollar of benefits for every two dollars earned above SGA – the equivalent of a 50 percent tax rate.

Two recently funded projects will use RSA administrative data to produce rigorous estimates of how past reductions in disincentives have affected VR outcomes for beneficiary clients. The first will examine the impacts of SSA's 1999 increase in SGA, from the $500 level that had been in place since 1990, to $700 on July 1, 1999, followed

[24] Under this demonstration, authorized by the 1999 Ticket Act, SSA will eliminate the SSDI earnings cliff at SGA for beneficiaries who are not also SSI recipients; instead, these beneficiaries will lose one dollar of benefits for every two dollars earned above SGA.

by smaller increases, indexed to inflation, thereafter (the 2004 value is $810). The second will examine the impacts of the introduction of state Medicaid Buy-in programs since 1999.[25]

[25] Both studies have been funded by NIDRR under Cornell's Rehabilitation Research and Training Center for Employment Policy. The SGA study will be conducted by Stapleton and Jasmin Sethi of Harvard University. The Medicaid Buy-in study will be conducted by Gina Livermore and Kosali Simon of Cornell.

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Exhibit 2.1. Terminology for Closure Status

Status Code	Status Description	Ineligible	Eligible	Served	Rehabilitation
8	Closed from referral, applicant, or extended evaluation status	✓			
26	Exited with an employment outcome		✓	✓	✓
28	Exited without an employment outcome after services		✓	✓	
30	Exited without an employment outcome before services		✓		
38	Post-employment services discontinued		✓	✓	

Exhibit 3.1. Disability Characteristics of Applicants*

Variable & Category	Non-Beneficiaries	Beneficiaries	Difference
Severity			
Most Severely Disabled	20.5	41.8	-21.2
Severely Disabled	48.5	45.1	3.4
Missing	6.8	6.5	0.3
Functional Status			
Low Gross Motor Function	16.5	22.5	-6.0
Low Personal Care Function	10.2	25.9	-15.7
Low Cognitive Function	2.3	4.8	-2.5
Missing	31.1	32.4	-1.3
Congenital or Acquired			
Congenital	20.1	27.5	-7.5
Acquired	71.0	64.9	6.1
Missing (not stated)	8.9	7.6	1.3
Primary Disability Category			
Orthopedic & Amputations	30.0	19.6	10.4
Area Affected:			
Not stated/missing	0.0	0.0	0.0
3+ limbs/entire body impaired	2.6	5.4	-2.8
1 upper & 1 lower limb impaired	1.1	1.7	-0.6
Upper limb(s) impaired	5.5	0.9	4.6
Lower limb(s) impaired	6.7	4.2	2.6
Other	14.1	7.4	6.7
Cause:			
Congenital/ill defined	1.5	1.0	0.5
Other diseases	2.5	2.8	-0.3
Arthritis/rheumatism	2.4	1.2	1.2
Intracranial hemorrhage/stroke	0.3	0.9	-0.5
Multiple sclerosis	0.4	1.5	-1.2
Accidents/injuries(Spinal Cord)	3.5	3.3	0.2
Other accidents, injuries, poisonings	18.5	6.9	11.6
Cerebral palsy	1.0	1.9	-0.9
Not determined	0.0	0.1	-0.1
Mental Illness & Substance Abuse	28.1	34.1	-5.9
Psychotic depression	1.8	1.7	0.1
Manic depression	1.6	3.1	-1.6
Schizophrenia, paranoia	0.6	5.1	-4.5
Other psychosis	2.5	6.1	-3.5
Neurosis	3.5	7.1	-3.6
Neurotic depression	2.9	2.1	0.8
Depression (uncategorized)	1.0	0.2	0.8
Other mental illness	4.9	4.8	0.0
Substance abuse	9.4	3.9	5.5
Not determined	1.5	0.2	1.3
Nonorthopedic physical	12.7	12.6	0.1
Mental retardation	4.9	13.1	-8.2
Hearing	7.0	4.3	2.7
Learning disability	10.2	3.8	6.4
Vision impairment	3.5	7.6	-4.2
Traumatic brain injury	2.2	4.7	-2.5
Missing	1.5	0.2	1.3

*Based on applicant cohort sample only (1,796 non-beneficiaries and 505 beneficiaries).

Exhibit 3.2. Demographic Characteristics of Applicants*

Variable & Category	Non-Beneficiaries	Beneficiaries	Difference
Age			
<=21	21.5	15.4	6.0
22-29	15.7	13.5	2.2
30-39	27.3	30.5	-3.2
40-49	22.8	28.2	-5.4
50-59	11.2	10.5	0.7
60-64	1.5	1.9	-0.4
Percent Male	52.6	52.4	0.3
Race			
White	83.2	74.5	8.7
Black	14.3	23.2	-8.8
American Indian /Alaskan Native	0.6	0.3	0.3
Asian or Pacific Islander	0.8	1.5	-0.6
Missing	1.0	0.5	0.5
Percent Hispanic	10.7	6.7	4.0
Marital Status			
Married	30.2	17.9	12.3
Widowed	1.6	3.5	-1.9
Divorced	17.3	18.3	-1.0
Separated	6.1	4.7	1.5
Never Married	44.0	55.4	-11.5
Missing	0.8	0.3	0.5
Dependents			
None	49.1	59.7	-10.5
1	24.6	22.5	2.0
2-3	19.7	14.2	5.5
>3	5.4	3.0	2.4
Missing	1.3	0.7	0.6

*Based on applicant cohort sample only (1,796 non-beneficiaries and 505 beneficiaries).

Exhibit 3.3. Education at Application*

Highest Degree	Full Sample			No Special Education			Special Education			Special Education Unknown		
	Non-Bene.	Bene.	Diff.	Non-Bene.	Bene.	Diff.	Non-Bene.	Bene.	Diff.	Non-Bene.	Bene.	Diff.
All degree categories	98.5	96.8	1.7	65.2	52.5	12.7	15.3	21.3	-6.0	18.0	23.0	-4.9
<12yrs educ	25.2	26.3	-1.1	11.2	8.4	2.9	7.8	9.7	-1.9	6.2	8.3	-2.1
12+yrs,no degree noted	6.1	7.1	-1.0	3.7	3.8	-0.1	0.7	1.0	-0.3	1.8	2.3	-0.5
High School Diploma/GED	56.2	52.6	3.6	40.9	31.0	9.8	6.3	10.1	-3.9	9.0	11.4	-2.4
Two-year Associates	4.8	3.9	0.9	4.1	3.2	0.9	0.3	0.5	-0.2	0.5	0.2	0.3
Four-year Bachelors	4.5	5.5	-1.1	3.8	5.1	-1.3	0.2	0.0	0.2	0.5	0.4	0.0
PostGrad Degree	1.7	1.3	0.1	1.6	1.0	0.1	0.0	0.0	0.0	0.1	0.3	-0.1

*Based on applicant cohort sample only (1,796 non-beneficiaries and 505 beneficiaries).

Exhibit 3.4. Work History of Applicants*

Variable & Category	Non-Beneficiaries	Beneficiaries	Difference
Work status at application			
Working	31.7	17.0	14.7
Homemaker/unpaid family worker	7.4	8.3	-0.9
Student	13.9	11.5	2.4
Trainee/volunteer or non-competitive employmen	2.1	4.7	-2.6
Not working-Looking for work	19.9	25.1	-5.2
Not working-Not looking for work	14.4	23.3	-8.9
Missing	10.7	10.1	0.6
Work prior to disability onset			
Worked	50.7	49.9	0.8
Longest job			
Unknown	5.0	5.2	-0.2
Less than 1 yr	40.0	45.5	-5.5
1-2 yrs	11.5	12.3	-0.8
3-5 yrs	12.3	12.1	0.2
6-9 yrs	8.0	7.4	0.7
10 yrs or more	12.3	10.4	1.9
None (includes all with congenital disabilities)	38.5	43.0	-4.6
Missing	10.8	7.1	3.7
Work post disability onset			
Worked	58.6	44.9	13.7
Longest job			
Unknown	28.8	19.5	9.4
Less than 1 yr	35.5	50.2	-14.6
1-2 yrs	11.8	12.7	-0.9
3-5 yrs	6.4	5.5	0.9
6-9 yrs	3.0	1.7	1.3
10 yrs or more	2.6	1.3	1.3
None	29.6	45.9	-16.3
Missing	11.8	9.2	2.6
Hourly Earnings in Most Recent Job within Last 24 Months *(year 2000 dollars)*			
Did not work in past 24 months	30.2	52.3	-22.2
Worked but missing earnings	14.1	11.9	2.2
<$3.35	1.2	3.6	-2.4
3.35-3.99	0.4	0.2	0.2
$4-4.99	1.0	2.4	-1.4
$5-5.99	8.3	9.1	-0.8
$6-6.99	10.6	7.1	3.5
$7-9.99	16.9	5.9	11.0
$10-14.99	10.8	4.0	6.8
$15 or more	6.8	3.6	3.2

*Based on applicant cohort sample only (1,796 non-beneficiaries and 505 beneficiaries).

Exhibit 3.5. Financial Support of Applicants*

Variable & Category	Non-Beneficiaries	Beneficiaries	Difference
Any Financial Assistance	28.1	100.0	-71.9
Any Public Assistance	17.3	100.0	-82.7
SSI Blind	0.0	3.1	-3.1
SSI Disabled	0.0	66.1	-66.1
SSDI	0.0	45.5	-45.5
SSI or SSDI	0.0	100.0	-100.0
AFDC	6.7	2.3	4.4
Veteran's benefits	1.2	1.1	0.1
Worker's Comp.	3.9	0.4	3.5
Private Insurance	0.6	0.5	0.1
Friends /Family support	7.3	10.8	-3.5
Primary Support			
Missing	0.6	0.4	0.2
Not Asked (no financial assistance)	71.8	0.0	71.8
Self (Earnings)	2.0	2.3	-0.3
Benefits	18.9	87.5	-68.6
Family or Friend	6.8	9.8	-3.0

*Based on applicant cohort sample only (1,796 non-beneficiaries and 505 beneficiaries).

Exhibit 4.1. Factors Accounting for the Difference in the Percentage of Applicants Determined Eligible and Difference in the Percentage of Eligible Clients Served*

Variable & Category	Difference in Percentage of:	
	Applicants Determined Eligible	Eligible Clients Served
Beneficiary status	-1.3	5.5
All work experience variables	-0.7	2
Post-onset work experience	-0.3	0.4
Prior VR closure	0.3	0
Other work experience variables	-0.7	1.5
Marital status	0.3	0.1
Race	0.1	0.1
All disability variables	2.9	-1.9
Disability type	0.9	-0.8
Acquired/congenital	0.1	-0.5
Severity	1.9	-0.5
Education	0.2	0.5
Age	0.2	0
Hispanic ethnicity	-0.1	0.1
All other characteristics at application	-0.3	-0.4
Total	-1.7	4.9

*Based on logit analysis of a) eligibility for all applicants (Appendix Exhibit 1) and b) eligible clients served (Appendix Exhibit 2).

Exhibit 5.1. Percentage of Served Clients Rehabilitated, by Beneficiary Status*

Variable	Non-beneficiaries	Beneficiaries	Difference
Percent rehabilitated of those served			
full sample	70.4%	58.2%	12.2
Sample w/ complete applicant characteristics	70.6%	56.9%	13.7
adjusted for applicant characteristics	67.6%	56.9%	10.7

*Full sample includes respondents with served status at closure (4,127 non-beneficiaries and 1,463 beneficiaries). Sample with complete applicant characteristics includes those who also had complete data on characteristics at application (3,289 non-beneficiaries and 1,064 beneficiaries). Adjusted estimate for non-beneficiaries is estimate of percentage of non-beneficiary clients who would be rehabilitated if their characteristics at application were, on average, the same as those of beneficiaries, based on logit analysis of rehabilitation for served clients (Appendix Exhibit 3.1).

Exhibit 5.2. Factors Accounting for the Difference in Percentage of Served Clients Who Closed as Rehabilitated*

Difference accounted for by:	Estimate
Beneficiary Status	10.7
All work experience variables	4.9
Post-onset work experience	2.8
Prior VR closure	0.7
Other work experience variables	1.4
Marital status	1
Race	0.3
All disability variables	-2.5
Disability type	-2.7
Acquired/congenital	-0.5
Severity	0.7
Education	-0.4
Age	-0.2
Hispanic ethnicity	-0.2
All other characteristics at application	0.2
Total	13.7

*Based on logit analysis of rehabilitation for served clients (Appendix Exhibit 3.1)

Exhibit 6.1. Employment Type at Closure for Rehabilitated Clients, by Beneficiary Status*

Employment Type	Non-beneficiaries	Beneficiaries	Difference
Competitive Labor Market	81.0	55.9	25.1
Self-Employment	3.1	3.5	-0.4
Sheltered Workshop	1.5	10.5	-9.0
Supported Employment	2.5	15.6	-13.0
Homemaker	2.7	5.2	-2.5
Unpaid Family Worker	0.2	0.0	0.2
Other	1.2	1.3	-0.2
Missing	7.9	8.1	-0.2

*Based on sample of clients closed as rehabilitated (2,877 non-beneficiaries and 837 beneficiaries)

Exhibit 6.2. Characteristics of Paid Jobs at Closure for Rehabilitated Clients with Paid Jobs, by Beneficiary Status*

Variable and Category	Non-beneficiaries	Beneficiaries	Difference
Hours per week			
<20hrs/wk	3.5	18.9	-15.4
20-35hrs/wk	25.0	49.9	-24.9
35+hrs/wk	63.7	26.4	37.4
Missing	7.8	4.8	3.0
Mean*	35.8	26.5	9.3
Hourly Wage *(inflation adjusted to 2000)*			
<$3.35	2.1	13	-10.9
3.35-3.99	0.7	1.6	-1.0
$4-4.99	2.0	3.7	-1.8
$5-5.99	13.9	26.8	-12.9
$6-6.99	15.9	18.4	-2.5
$7-9.99	28.6	16.8	11.9
$10-14.99	17.7	8.7	9.0
$15 or more	8.5	2.5	6.0
Missing	10.6	8.4	2.2
Mean*	$9.12	$6.56	$2.56
Employer Health Insurance Benefit			
No	54.6	76.5	-21.9
Yes	33.8	16.9	16.9
Missing	11.6	6.6	5.0
Earnings per Month >$500 *(i.e. SGA -- not inflation adjusted)*			
No	9.5	47.2	-37.7
Yes	81.6	45.5	36.1
Missing	8.9	7.3	1.6
Client to receive ongoing support services at closure			
No	95.1	76.5	18.7
Yes	2.6	20.7	-18.1
Missing	2.3	2.8	-0.6
Type of Job			
Competitive	89	63.3	25.7
Self-Employment	3.5	4	-0.5
Sheltered Workshop	1.6	11.9	-10.3
Supported Employment	2.8	17.7	-14.9
Other	1.3	1.5	-0.3
Missing	1.9	1.7	0.2

Exhibit 6.2. Continued

Variable and Category	Non-beneficiaries	Beneficiaries	Difference
Monthly Earnings *(inflation adjusted to 2000)*			
<$250	1.3	14.1	-12.8
$250-500	3.9	19.5	-15.6
$501-1000	23.2	32.9	-9.7
$1001-1500	27	12.9	14.2
$1501-2000	16	6.4	9.7
$2001-2500	7.4	2.7	4.7
$2500-3000	4.7	1.2	3.5
>$3000	5	1.3	3.7
Missing	11.5	9.1	2.4
Mean*	$1,455	$801	$654
Type of Occupation			
Prof., Man., or Tech.	24.8	12.5	12.3
Clerical/Sales	23.5	22	1.4
Service	23.5	30.2	-6.8
Ag., Fish., Forest., etc.	2	2	0.0
Processing	1	2	-1.1
Machine Trades	3.9	2.1	1.8
Benchwork	6.4	16.3	-9.8
Structural Work	5.4	2.2	3.1
Miscellaneous	7.6	8.5	-0.9
Missing	2	2.1	-0.1

*Based on sample of clients closed as rehabilitated who had paid jobs (n = 2,687 non-beneficiaries and 764 beneficiaries).

Exhibit 6.3. Factors Accounting for Differences in Closure Job Characteristics*

Characteristics at Application	Rehabilitated Clients		Rehabilitated Clients with Paid Jobs					
	Percentage Difference in		Percent Difference in Mean of			Percentage Difference in		
	Competitive Jobs	Paid Jobs	Hourly Earnings	Hours Worked	Monthly Earnings**	Health Insurance	Above SGA	PMT Jobs
Beneficiary status	10.1	0.1	19.4	26.2	45.6	12.9	25.1	1.6
All work experience variables	1.7	2.1	2.3	1	3.3	-0.3	0.8	0.7
Post-onset work experience	0.8	0.7	0.1	0.2	0	0	0	0
Prior VR closure	0.4	0.4	0	0.4	-0.6	0.4	0.4	-0.4
Other work experience variables	0.5	1	1	2.7	0.3	0.3	0.3	-0.3
Marital status	0.2	0	1.6	2.6	1.1	1.2	0.6	-0.6
African American	-0.7	-0.3	0.6	-0.3	0.3	0.1	-0.3	0.8
All disability variables	10.3	6.5	7.9	7.9	15.8	5.6	11.6	5.7
Disability type	7.2	5.5	7.4	12.8	5.8	8.2	4.4	-4.4
Acquired/congenital	0.6	0	0.3	1	-0.1	1.4	0.3	-0.3
Severity	2.5	1	2.1	0	1.9	1	-1.9	-1
Education	1.4	0.6	0.9	4	1.8	1.6	1.9	-1.9
Age	-0.1	0	-0.6	-0.4	-0.2	-0.5	-0.1	0.1
Hispanic ethnicity	0	0.2	0.2	0.1	-0.4	-0.6	0.3	-0.3
All other characteristics at application	1.5	-6.4	-6.4	0.5	2.8	1.8	1.7	0.8
Total	24.4	2.8	36.4	37.3	73.7	22.2	41.5	11.7

*Based on multivariate analyses of paid and competitive employment at closure for rehabilitated clients (Appendix Exhibit 4.1) and characteristics of paid jobs for those rehabilitated clients with paid jobs (Appendix Exhibits 4.3 and 4.4).

**Sum of percentages for earnings per hour and hours per month. All percentage changes are computed as changes in natural logarithms.

Exhibit 7.1. Paid and Competitive Employment at Closure and Follow-up for Served* Clients, by Beneficiary Status, and Adjustments for Attrition Bias

Variable	Non-beneficiaries	Beneficiaries	Difference
Paid Employment			
Percent both rehabilitated and having:			
Paid employment at closure			
sample with applicant characteristics	68.3%	53.4%	14.8
sample with applicant characteristics and follow-up data	72.9%	57.9%	15.1
Paid employment at follow-up			
sample with applicant characteristics and follow-up data	61.8%	47.7%	14.2
adjusted for attrition bias	57.9%	44.0%	13.9
adjusted for applicant characteristics	56.2%	47.7%	8.5
adjusted for attrition bias	52.6%	44.0%	8.6
Percent having paid employment at follow-up			
sample with applicant characteristics and follow-up data	69.8%	53.3%	16.5
adjusted for attrition bias	65.3%	49.2%	16.2
adjusted for applicant characteristics	60.7%	53.3%	7.5
adjusted for attrition bias	56.9%	49.2%	7.7
Competitive Employment			
Percent both rehabilitated and having:			
Competitive employment at closure			
sample with applicant characteristics	61.8%	35.9%	25.9
sample with applicant characteristics and follow-up data	66.0%	37.9%	28.1
Competitive employment at follow-up			
sample with applicant characteristics and follow-up data	56.0%	31.1%	24.9
adjusted for attrition bias	52.5%	29.4%	23.0
adjusted for applicant characteristics	45.2%	31.1%	14.1
adjusted for attrition bias	42.4%	29.4%	12.9
Percent having competitive employment at follow-up			
sample with applicant characteristics and follow-up data	63.5%	34.4%	29.1
adjusted for attrition bias	59.5%	32.6%	26.9
adjusted for applicant characteristics	51.4%	34.4%	17.0
adjusted for attrition bias	48.1%	32.6%	15.6

*Estimates adjusted for applicant characteristics and differences after adjustments are based on a) Appendix Exhibit 5.2 for paid employment at follow-up for rehabilitated clients; b) Appendix Exhibit 5.1 for paid employment at follow-up for all served clients; c) Appendix Exhibit 5.2 for competitive employment at follow-up for rehabilitated clients; and d) Appendix Exhibit 5.1 for competitive employment at follow-up for all served clients.

Exhibit 7.2. Factors Accounting for Differences in Paid and Competitive Employment at Follow-up for Served Clients*

Difference accounted for by:	Estimate	
	Paid	**Competitive**
Beneficiary Status	7.5	17.0
All work experience variables	5.0	5.1
Post-onset work experience	3.1	3.2
Prior VR closure	0.3	0.1
Other work experience variables	1.7	1.8
Marital status	1.4	1.7
Race	0.0	-0.1
All disability variables	2.2	4.2
Disability type	0.7	2.1
Acquired/congenital	-0.3	0.0
Severity	1.9	2.2
Education	0.3	0.6
Age	-0.2	-0.2
Hispanic ethnicity	0.0	0.1
All other characteristics at application	0.4	0.7
Total	16.5	29.1

*Based on logit analysis of paid and competitive employment for all served clients (Appendix Exhibit 5.1)

Exhibit 7.3. Job Characteristics for Served Clients with Paid Jobs at Follow-up, by Beneficiary Status*

Variable and Category	Non-beneficiaries	Beneficiaries	Difference
Hours per week			
<20hrs/wk	8.1	27.4	-19.3
20-35hrs/wk	24.8	42.3	-17.5
35+hrs/wk	65.5	26.5	39.0
Missing	1.7	3.8	-2.1
Mean*	36.8	26.2	10.5
Hourly Wage (inflation adjusted to 2000)			
<$3.35	2.9	15.4	-12.5
3.35-3.99	1.1	1.3	-0.2
$4-4.99	2.2	4.8	-2.6
$5-5.99	9.7	18.3	-8.6
$6-6.99	14.8	15.5	-0.6
$7-9.99	29.7	20.0	9.7
$10-14.99	21.8	9.7	12.1
$15 or more	12.2	2.2	9.9
Missing	5.6	12.8	-7.2
Mean*	$9.97	$6.61	$3.36
Employer Health Insurance Benefit			
No	52.3	77.7	-25.4
Yes	46.5	19.7	26.9
Missing	1.2	2.6	-1.4
Earnings per Month >$500 (i.e. SGA -- not inflation adjusted)			
No	11.0	44.4	-33.4
Yes	83.0	41.8	41.2
Missing	6.0	13.8	-7.8
Client to receive ongoing support services at closure			
No	7.6	18.8	-11.2
Yes	91.8	76.9	14.9
Missing	0.7	4.3	-3.6
Type of Job			
Competitive	89.9	63.0	26.8
Self-Employment	6.1	7.9	-1.8
Sheltered Workshop	1.9	16.4	-14.5
Supported Employment	1.4	12.3	-10.9
Missing	0.8	0.2	0.5

Exhibit 7.3. Continued

Variable and Category	Non-beneficiaries	Beneficiaries	Difference
Monthly Earnings (inflation adjusted to 2000)			
<$250	3.0	17.6	-14.6
$250-500	4.8	19.8	-15.0
$501-1000	19.7	24.5	-4.8
$1001-1500	25.1	13.5	11.6
$1501-2000	16.2	4.2	12.0
$2001-2500	9.5	4.1	5.4
$2500-3000	6.6	0.9	5.7
>$3000	9.0	1.7	7.3
Missing	6.1	13.8	-7.7
Mean*	$1,455	$801	$1,637
Type of Occupation			
Prof., Man., or Tech.	30.2	16.8	13.4
Clerical/Sales	18.6	14.8	3.9
Service	23.5	30.2	-6.8
Ag., Fish., Forest., etc.	1.5	1.9	-0.5
Processing	3.6	4.6	-1
Machine Trades	4.9	1.9	3
Benchwork	6.4	16.3	-9.8
Structural Work	4	1.3	2.7
Miscellaneous	0.8	1.4	-0.6
Missing	0.5	1.1	-0.6

*Based on the sample of all served clients reporting paid jobs at follow-up (2,083 non-beneficiaries and 564 beneficiaries).

Exhibit 7.4 Comparison of Characteristics of Paid Jobs for Served Clients at Closure and Follow-up

Variable	Non-beneficiaries	Beneficiaries	Difference	Non-beneficiaries	Beneficiaries	Difference	Non-beneficiaries	Beneficiaries	Difference
Job characteristics	**Log of Hourly Earnings**			**Log of Weekly Hours Worked**			**Log of Monthly Earnings**		
Mean for paid jobs of rehabilitated (status 26) clients:									
At closure									
sample with applicant characteristics	2.117	1.755	0.362	3.536	3.161	0.375	7.123	6.386	0.737
sample with applicant characteristics and follow-up data	2.151	1.741	0.410	3.548	3.117	0.431	7.170	6.328	0.842
At follow-up									
sample with applicant characteristics and follow-up data	2.202	1.681	0.521	3.555	3.110	0.445	7.228	6.261	0.967
adjusted for attrition bias	2.168	1.695	0.473	3.543	3.154	0.389	7.181	6.319	0.862
adjusted for applicant characteristics	1.986	1.681	0.305	3.543	3.110	0.331	7.181	6.261	0.636
adjusted for attrition bias	1.952	1.695	0.257	3.531	3.154	0.377	7.134	6.319	0.815
Mean for paid jobs at follow-up for served (status 26 & 28) clients									
sample with applicant characteristics and follow-up data	2.192	1.691	0.501	3.535	3.103	0.432	7.198	6.264	0.934
adjusted for attrition bias	2.158	1.705	0.453	3.523	3.147	0.376	7.151	6.322	0.829
adjusted for applicant characteristics	1.991	1.691	0.300	3.428	3.103	0.325	6.889	6.264	0.625
adjusted for attrition bias	1.957	1.705	0.252	3.416	3.147	0.269	6.842	6.322	0.520
Job characteristics	**Health Insurance**			**Earnings > SGA**			**PMT Occupation**		
Percent of paid jobs for rehabilitated (status 26) clients with characteristic									
At closure									
sample with applicant characteristics	39.8%	17.6%	22.2	89.6%	48.1%	41.5	26.3%	14.7%	11.7
sample with applicant characteristics and follow-up data	43.4%	18.5%	24.8	90.6%	46.2%	44.4	28.4%	15.2%	13.2
At follow-up									
sample with applicant characteristics and follow-up data	50.5%	22.4%	28.1	90.6%	51.4%	39.2	31.7%	18.3%	13.4
adjusted for attrition bias	46.4%	21.3%	25.0	89.6%	53.6%	36.0	29.3%	17.6%	11.8
adjusted for applicant characteristics	44.7%	22.4%	22.3	71.7%	51.4%	20.3	22.9%	18.3%	4.6
adjusted for attrition bias	41.1%	21.3%	19.8	70.9%	53.6%	17.3	21.2%	17.6%	3.6
Percent of paid jobs at follow-up for served clients (status 26 & 28) with characteristic									
sample with applicant characteristics and follow-up data	48.0%	21.3%	26.7	88.9%	50.9%	37.9	31.2%	18.7%	12.5
adjusted for attrition bias	44.1%	20.3%	23.8	87.9%	53.1%	34.8	28.9%	18.0%	10.9
adjusted for applicant characteristics	43.1%	21.3%	21.8	71.7%	50.9%	20.8	23.0%	18.7%	4.3
adjusted for attrition bias	39.6%	20.3%	19.3	70.9%	53.1%	17.9	21.4%	18.0%	3.4

*Estimates adjusted for applicant characteristics and differences after adjustments are based on multivariate analyses reported in a) Appendix Exhibits 5.3 and 5.4 for served clients with paid jobs at follow-up and b) Appendix Exhibits 5.5 and 5.6 for rehabilitated clients with paid jobs at follow-up.

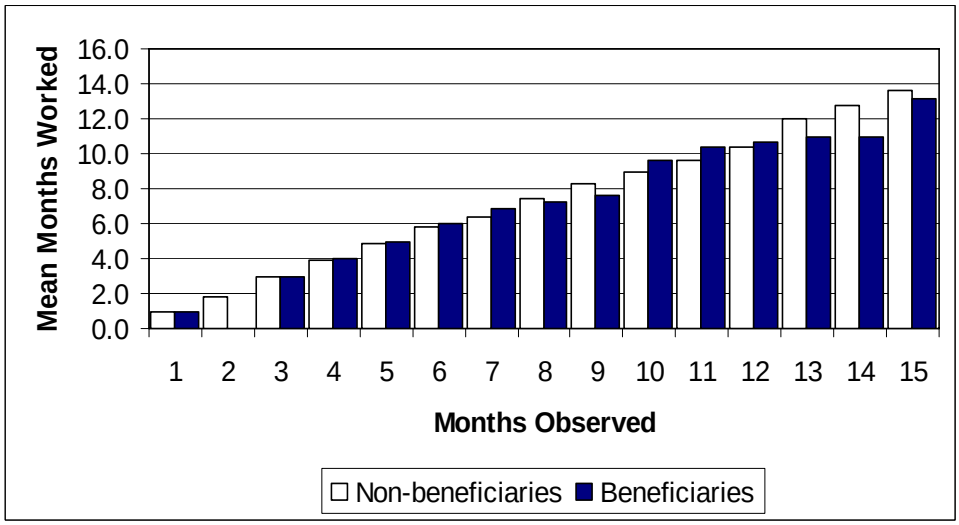
Exhibit 7.5. Served Clients with Paid Employment at Follow-up

Characteristics at Application	Percent Difference in Mean of			Percentage Difference in		
	Hourly Earnings	Hours Worked	Monthly Earnings**	Health Insurance	Above SGA	PMT Jobs
Beneficiary status	27.1	28.3	55.5	19.4	19.1	3.8
All work experience variables	2.3	2.5	4.8	0.5	2.7	0.2
Post-onset work experience	0.4	0.0	0.4	0.0	0.1	0.0
Prior VR closure	-0.1	0.1	0.0	0.5	0.6	0.4
Other work experience variables	1.9	2.4	4.4	0.1	2.0	-0.2
Marital status	1.6	1.5	3.2	0.7	1.5	0.9
African American	0.3	0.0	0.3	0.0	0.0	0.1
All disability variables	9.2	3.4	12.5	3.6	8.6	3.8
Disability type	7.0	3.6	10.5	3.8	6.9	3.2
Acquired/congenital	1.0	0.1	1.1	0.1	-0.1	0.3
Severity	1.2	-0.3	0.9	-0.2	1.8	0.3
Education	2.9	1.7	4.6	0.3	1.7	1.4
Age	0.2	-0.1	0.1	-0.1	0.1	-0.1
Hispanic ethnicity	-0.3	0.0	-0.3	-0.3	0.5	-0.2
All other characteristics at application	2.0	0.2	2.2	-0.4	0.7	1.0
Total	45.5	37.6	82.9	23.8	34.8	10.9

*Based on multivariate analyses reported in Appendix Exhibits 5.3 and 5.4.

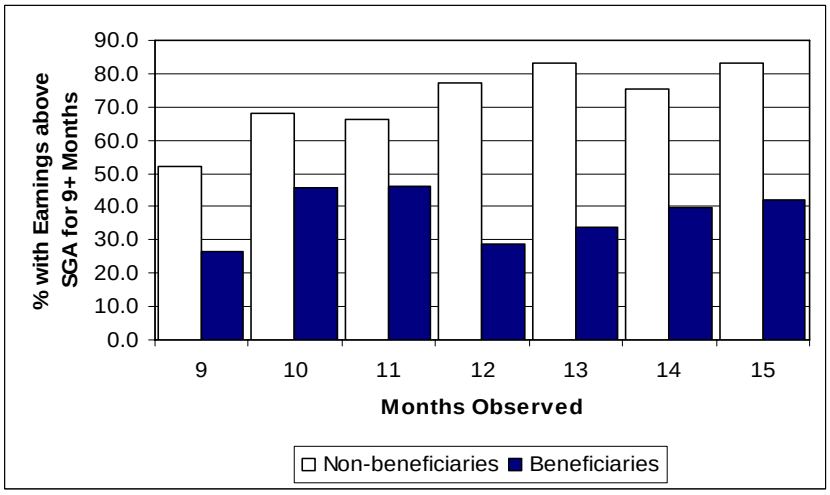
**Sum of percentages for earnings per hour and hours per month. All percentage changes are computed as changes in natural logarithms.

Exhibit 8.1. Mean Months Worked for Rehabilitated Clients, by Months Observed and Beneficiary Status*



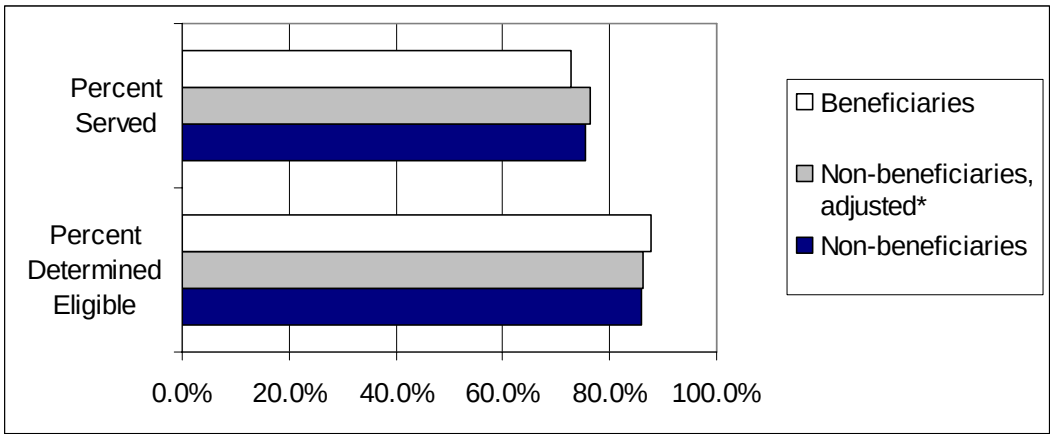
*Based on the sample of rehabilitated clients with follow-up data on employment(1,981 non-beneficiaries and 585 beneficiaries).

Exhibit 8.2 Percentage of Rehabilitated Clients with Earnings above SGA for Nine or More Months, by Number of Months Observed*



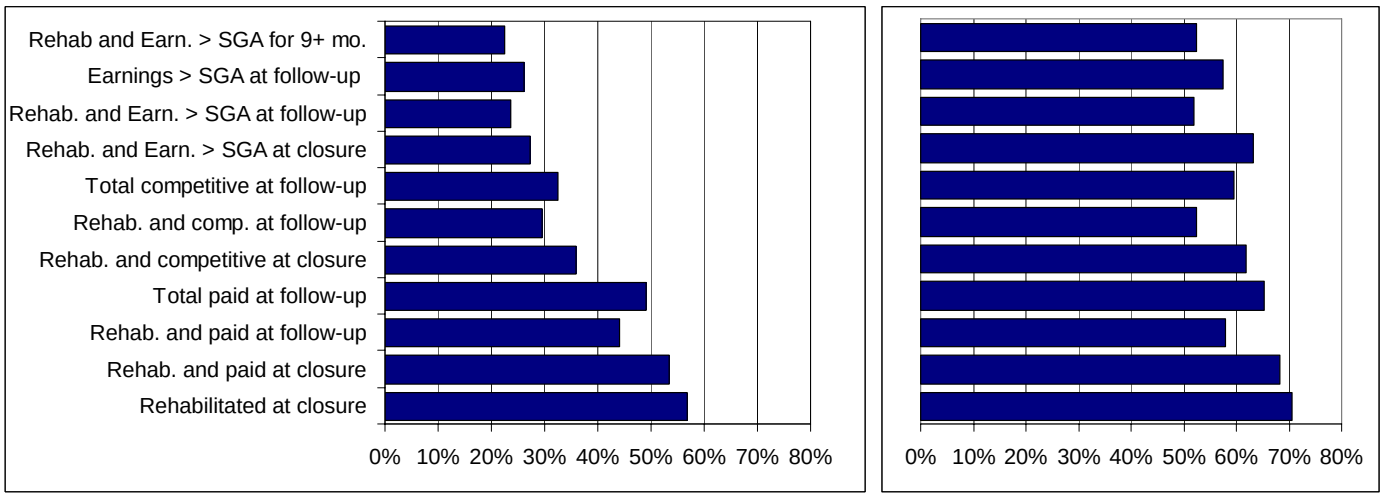
*Based on the sample of rehabilitated clients with follow-up data on employment and enough information to determine earnings relative to SGA in at least 9 of the 15 months beginning the third month before closure (1,661 non-beneficiaries and 492 beneficiaries).

Exhibit 9.1. Percentage of Applicants Determined Eligible and Served, by Beneficiary Status



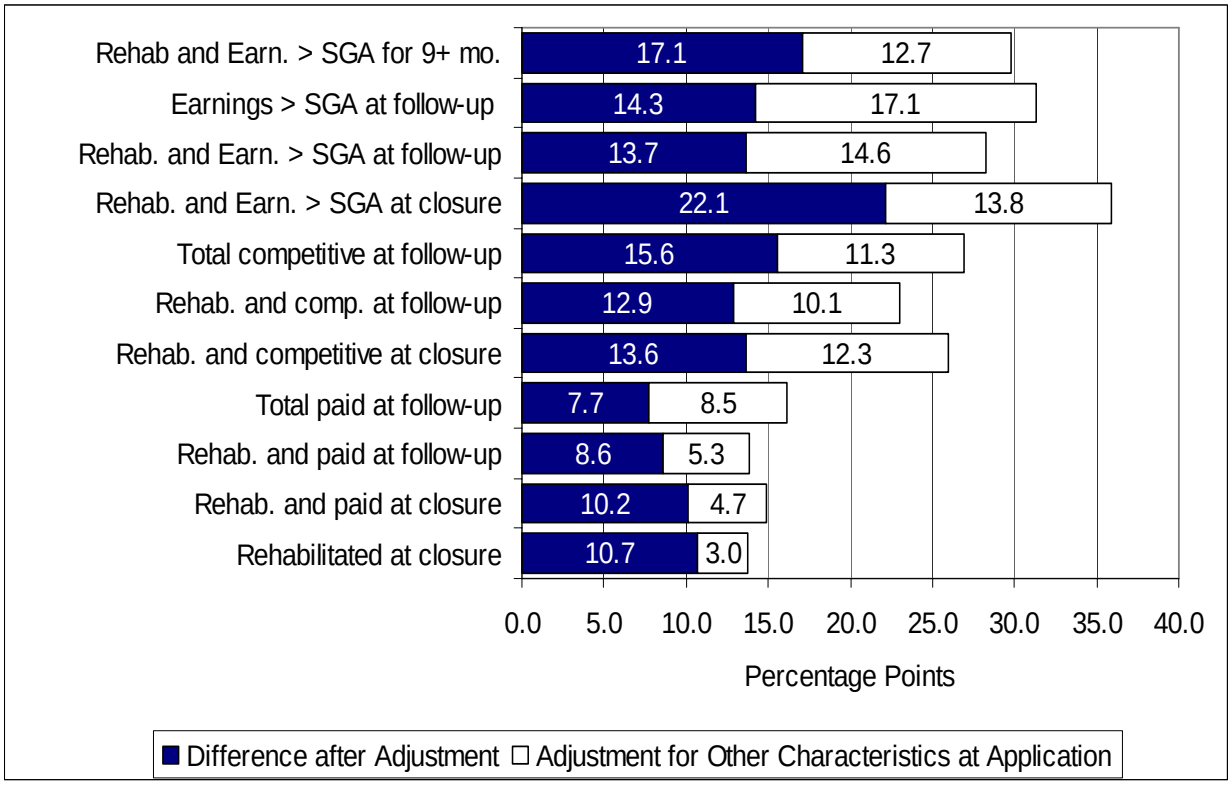
*Each adjusted estimate for non-beneficiary clients is an estimate of what the relevant percentage would have been if the mean characteristics at application of non-beneficiaries were the same as those of beneficiaries. Adjustments for the percentage of applicants determined eligible is based on our logit analysis of the percentage eligible reported (Appendix Exhibit 1). Adjustment for the percentage of applicants served required two steps. First, we computed percentages of eligible applicants served by beneficiary status, including an adjusted estimate for non-beneficiaries based on the logit analysis of the percentage of eligible applicants served (Appendix Exhibit 2). Then, we multiplied the three estimates produced by the corresponding estimates for percentages of applicants determined eligible.

Exhibit 9.2 Selected Outcomes for Served Clients, by Beneficiary Status*



*Each estimate is based on values reported in earlier tables. Most require multiplication of hierarchical reported hierarchical estimates. For example, for the percentage of served clients who are rehabilitated and earning above SGA at closure is obtained by multiplying the percentage of served clients who are rehabilitated by both the percentage of rehabilitated clients who have paid jobs at closure and by the percentage of rehabilitated clients with paid jobs at closure who were earning above SGA. Estimates for follow-up outcomes are adjusted for attrition bias.

Exhibit 9.3. Differences between Outcomes for Beneficiary and Non-beneficiary Clients Before and After Adjustment for Characteristics at Application*



*Total differences were derived from the estimates reported in Exhibit 9.2. Differences after adjustment were determined in an analogous fashion, using estimates of percentages for non-beneficiaries that were adjusted for differences in other characteristics at application instead of the unadjusted percentages, as reported in the text. The size of the adjustment is the difference between the unadjusted estimate and the adjusted estimate.

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