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Vocational Rehabilitation on the Road to Social Security Disability: Longitudinal Statistics from Matched Administrative Data

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Vocational Rehabilitation on the Road to Social Security Disability: Longitudinal Statistics from Matched Administrative Data

Abstract

Vocational rehabilitation (VR) agencies can potentially help disability-insured workers stay at work or return to work when they experience the onset of a disabling physical or mental condition. Such assistance could prevent or delay their exit from the labor force and entry into the Social Security disability (SSD) rolls. This study presents new descriptive information on the extent to which VR applicants receive SSD benefits before or after VR application. The analyses show that substantial numbers of VR applicants entered SSD in the 60 months following VR application—more than 50,000 (11.3 percent) of the first-time VR applicants in 2003. SSD entry varies with VR applicant characteristics; those with relatively high SSD entry include non-Hispanic whites, those not employed at application, those with more than a high school education, and especially those already in SSI but not SSD. There is also wide variation in SSD entry across states, with some states having entry percentages twice as high as others. We also found a positive relationship between our measure of wait time and entry into SSD, and we discuss strategies to estimate the causal effect of wait time on SSD entry—an effect that could theoretically be in either direction. Although the large number of VR applicants entering SSD after VR application is modest compared to the number receiving an SSD award each year, the impact that VR services have on later SSD and Medicare expenditures could be in the billions of dollars annually, in either direction.

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I. INTRODUCTION

Social Security disability (SSD) benefits, which are administered by the Social Security Administration (SSA), are an essential lifeline for millions of Americans. SSD benefits are available to people with established work histories who have a medically determinable work disability expected to last at least one year or to result in death. Others with qualifying medical conditions are entitled to SSD by the entitlement of a parent to retirement, survivor, or disability benefits or a widow or widower entitled to survivor benefits. All benefits are paid from the Old Age, Survivors, and Disability Insurance (OASDI) Trust Funds; benefits for workers with disabilities and their dependents (disabled or not) are paid from the Disability Insurance (DI) Trust Fund, whereas benefits for disabled dependents of retirees and deceased workers are paid from the Old Age and Survivors Insurance (OASI) Trust Fund.

Rapid growth in SSD beneficiaries and expenditures is of major concern to policymakers. SSA's actuaries project that the DI Trust Fund will be exhausted in 2016 (Board of Trustees 2011). Unless Congress acts, SSA will be able to pay benefits only to the extent that payroll tax revenues continue to flow into the Trust Fund. As a result, there is considerable interest in policy reforms that would slow the growth in the number of SSD entrants—especially workers with disabilities, who constitute a large majority of SSD beneficiaries.

Many experts believe that early intervention, before an individual enters SSD, is the key to increasing the proportion of workers who stay at work or return to work after disability onset rather than exit the labor force and enter SSD. The federal-state Vocational Rehabilitation (VR) program is a potential point of early intervention for all SSD entrants, and by far the largest public program offering employment services exclusively to people with disabilities.

In this paper, we report new descriptive information on the extent to which VR applicants receive SSD before or after VR application.[1] We use complete matches of individual-level VR closure records from the Rehabilitation Services Administration (RSA) for 1998 through 2009 to SSA demographic, disability program, and earnings files. We report findings on annual cohorts of first-time applicants for VR services in each year from 1998 through 2005 to track trends in SSD entry after VR application. In addition, we use a single cohort—those who applied for VR services in 2002—to provide more extensive information on the characteristics and SSD outcomes for specific groups.

The analyses shows that substantial numbers of VR applicants entered SSD in the 60 months following VR application—more than 50,000 (11.3 percent) of the first-time VR applicants in 2003. SSD entry varies with VR applicant characteristics; those with relatively high SSD entry include non-Hispanic whites, those not employed at application, those with more than a high school education, and especially those already in SSI but not SSD. There is also wide variation in SSD entry across states, with some states having entry percentages twice as high as others.

[1] We refer to SSDI workers, disabled adult children, and disabled widow(er) beneficiaries collectively as "Social Security disability beneficiaries." Some writers use SSD to include all Supplemental Security Income (SSI) recipients under the age of 65. We do not do so here, however, because SSI benefits are a welfare benefit and not part of the Social Security program, even though both programs are administered by the SSA.

We also assess the potential for using the matched data to evaluate the impact of VR services on SSD entry by VR applicants who have not already received an SSD award. We consider the hypothetical impacts of VR service delivery on SSD entry and how those impacts might vary with certain applicant characteristics, such as the ability to engage in substantial gainful activity (SGA) and non-medical eligibility for SSD. Finally, we consider evaluating the impact of exogenous delays in VR service delivery on SSD entry for VR applicants and present statistics on the extent of such delays.

We describe the positive relationship between our measure of wait time and entry into SSD, and we discuss strategies to estimate the causal effect of wait time on SSD entry—an effect that could theoretical be in either direction. Although the large number of VR applicants entering SSD after VR application is modest compared to the number receiving an SSD award each year, the impact that VR services have on later SSD and Medicare expenditures could be in the billions of dollars annually, in either direction. Additional research may provide better information on the direction and size of current impacts. More important, the findings suggest the potential value of cross-agency collaboration designed to improve long-term employment outcomes for workers before they enter SSD.

We provide more background on SSD and the VR program in Section II. In Section III, we describe previous research related to SSD entry and VR services. We describe the matched administrative data in Section IV. In Section V, we present statistics on the number of new VR applicants, their SSD and disability insured status at VR application, and later entry into SSD. We present statistics on SSD entry by VR applicant characteristics in Section VI. Our assessment of the potential for evaluating the impact of VR services on SSD awards appears in Section VII. We conclude in Section VIII with a summary of the findings and a discussion of the implications for disability policy.

II. BACKGROUND

A. SSD Eligibility Criteria

SSD is the nation's primary earnings replacement program for workers who become unable to support themselves through work because of a physical or mental impairment ("disabled workers"). The program also provides disability benefits to disabled adult children (DAC) and disabled widow(ers) of other OASDI beneficiaries. In making determinations about SSD disability eligibility, SSA assesses whether a person (1) is unable to engage in SGA for at least 12 months or until death (the "medical eligibility") and (2) either meets the earnings history requirement for SSD eligibility, or is entitled to Social Security as a dependent of another beneficiary ("non-medical eligibility"). As these requirements play an important role in how VR services might affect SSD entry, we consider them in some detail.

SSA defines SGA as the performance of significant physical and/or mental activities in work for pay or profit, or in work of a type generally performed for pay or profit. In 2012, SGA is defined as any activity that is comparable to unsubsidized paid work for monthly wages of at least $1,010 for non-blind individuals or $1,690 for blind individuals.[2] To be eligible for SSD, SSA must determine that the beneficiary is not able to engage in SGA for a medical reason, and is in fact not engaged in SGA, for a period of at least 12 months. There is a five-month benefit waiting period that starts with the "month of disability onset"—the first month for which SSA determines that the claimant meets both the medical criterion and non-medical eligibility criteria.

After SSD entry, beneficiaries will lose their benefits if they engage in SGA for a sufficiently long period. The law requires immediate termination of benefits if the person's medical condition improves enough to allow engagement in SGA ("medical recovery") or if the individual engages in SGA before the end of the 12 months starting with the month of disability onset (including the 5-month waiting period). After that, if medical recovery has not occurred, an SSD beneficiary is allowed to engage in SGA for a limited period without benefit loss. This includes 9 trial work period (TWP) months followed by 3 grace period months in which a beneficiary may earn any amount without benefit loss. After that, benefits first are suspended, and then terminated (starting in month 37 after TWP completion), if the beneficiary continues to engage in SGA.

The non-medical criterion is also complex. For disabled workers, satisfaction is dependent on the worker's history of the earnings in covered employment—jobs that require the payment of payroll taxes by the worker and employer (almost all jobs today). To evaluate satisfaction of the requirement, SSA first converts annual earnings in covered employment from past years into "quarters of coverage" (QC). In 2012, one QC requires calendar year earnings of $1,130, an amount that is adjusted for wage inflation every year. Workers who earn more than $4,520 in 2012 are credited with the maximum of four QC for the year. Note that an individual does not have to engage in SGA to earn quarters of coverage; the QC amount is 37 percent as large as three months of earnings at the non-blind SGA amount—$3,030 in 2012.

[2] The SGA amount includes the total (unsubsidized) earnings net of allowable expenses that SSA classifies under impairment-related work expenses (IRWE).

To meet the SSD earnings history requirement, a disabled worker beneficiary must be both "fully insured" and "disability insured." To be fully insured, the individual must have accumulated QC at least as large as the difference between the individual's current age and age 21, with a minimum of 6 QC. Thus, apart from the minimum, the individual must have accumulated an average of one QC per year after age 21. To be disability insured, a worker age 31 or older must have earned at least 20 QC in the previous 40 calendar quarters, or an average of 2 QC per year. Workers ages 24 through 30 must have earned an average of 2 QC per year since they were age 21—a minimum less than 20. Workers under age 24 must have earned at least six QC in the last 12 calendar quarters. There is no minimum age for disabled-worker benefits.

DAC and DWB are not required to meet work history requirements themselves. Instead, they must be an eligible dependant of a primary beneficiary—an individual entitled to any OASDI benefit on the basis of the individual's own earnings history. Adult children of primary beneficiaries qualify for DAC if disability onset is determined to have occurred before age 22; before age 18 they would qualify on the basis of age alone. Widow(ers) of primary beneficiaries must be at least 50 to qualify as a DWB; if not disabled, they must wait to age 60 before they are eligible for survivor benefits.

B. SSD Policy Concerns

The number of SSD beneficiaries is very large. In December 2010, 9.4 million people received SSD benefits, including 8.2 million disabled workers; 949,000 DAC; and 245,000 DWB (SSA 2011a, Tables 5.D1, 5.F4 and 5.F8). In 2010, an estimated $134 billion in benefits were paid to SSD beneficiaries, of which $124 billion came from the DI Trust Funds.[3] The latter figure far exceeded the $104 billion in DI Trust Fund revenues, and the Trustees currently project that the Fund will be exhausted by the end of 2016 unless Congress takes action to increase revenue and/or reduce benefits.

Federal expenditures to support SSD beneficiaries are much larger once other benefits they receive are considered, although there is no complete accounting. SSD beneficiaries are automatically entitled to Medicare after 24 months of entitlement to SSD. According to the Center for Medicare & Medicaid Services (CMS), in 2011, Medicare expenditures for the under-65 population—almost all of whom are SSD beneficiaries—totaled nearly $100 billion (CMS 2012, Table III.5). Federal expenditures for SSD benefits and Medicare benefits for SSD beneficiaries accounted for more than 6 percent of all federal outlays.[4]

[3] The DI Trust Fund total is from the Social Security Trustees (2011, Table III.A5) and includes payments for disabled workers and all dependents, including any DAC. The same table shows $2.1 billion in benefit payments to DWB, but does not report total benefit payments to DAC of retired or deceased workers. We estimated the latter by multiplying 12 times the December 2010 mean benefit for DAC of retired workers by the number of DAC of retired workers (12 x $587.20 x 250,262), then repeating for DAC of deceased workers (12 x $755.10 x 601,420) and adding the results to obtain an estimated $7.2 billion in OASI Trust Fund expenditures for DAC (mean benefits and numbers from SSA 2011b, Table 2).

[4] Total outlays in 2011 were $3,603 billion (Congressional Budget Office 2012).

A significant minority of SSD beneficiaries also receive SSI—13.2 percent in December 2010, adding an estimated $3.8 billion dollars in cash benefits.[5] The vast majority of those receiving SSI, as well as a small minority of other SSD beneficiaries, also receive Medicaid. Some beneficiaries also receive other public benefits, such as veterans' compensation, veterans' health benefits, food stamps, and housing subsidies. Some also receive private benefits, most notably workers' compensation and private disability insurance (PDI) or pension benefits.

Past efforts to reduce SSD caseloads and program expenditures have focused on helping beneficiaries return to work with sufficient earnings to forgo their SSD benefits. To date, those efforts have been largely unsuccessful in slowing growth in the number of SSD beneficiaries or public expenditures for their support.

Many practitioners and researchers have recommended taking a different tack: reducing the number of individuals who enter SSD via services and incentives that help them establish or maintain self-sufficiency through work rather than enter SSD.[6] SSA has previously considered testing whether VR agencies could successfully provide early intervention services for disabled worker applicants—effectively diverting them from entry into SSD (Berkowitz 2002). This is the first study to examine the extent to which applicants for VR services actually enter SSD after application for VR services.

C. State Vocational Rehabilitation

As the primary source of publicly funded employment supports for people with disabilities, state VR agencies are well-positioned to assist people with disabilities to work rather than enter SSD. VR agencies help individuals return to work or gain new employment, as opposed to simply providing cash payments or insurance (Scotch 2001), and many SSA beneficiaries have acknowledged the role of VR in their efforts to return to work (GAO 2007). Hence, it seems very likely that VR services serve as an early intervention, as defined above, when provided to some clients.

RSA funds state VR agencies to provide employment-related services for individuals with disabilities and requires the agencies to give priority to individuals who are significantly disabled should the state be unable to serve all eligible individuals. Federal grants made to each state's designated VR agency are administered under an approved state plan. The state-matching requirement is 21.3 percent.[7] Total expenditures for fiscal year (FY) 2010 were $3.04 billion. Awards ranged in value from $820,583 to $289,165,167.[8] States report electronic data on each VR client whose case is closed (case "closures") in each fiscal year according to a prescribed case service report format. These data are stored electronically in the RSA 911 file—612,537 records in FY 2010.

[5] Estimate equal to 12 times the number of SSD beneficiaries receiving SSI in December 2012 times their average monthly benefit (12 x 1,369,462 x $230.40). Source: (SSA 2011, Tables 65 and 66).

[6] Examples include: MacDonald and O'Neil (2006), Social Security Advisory Board (2006), Stapleton et al. (2006), Autor and Duggan (2010), Burkhauser and Daly (2011), and Mann and Stapleton (2011).

[7] See Government Accountability Office (GAO 2009) for an analysis of the federal and state funding mechanism.

[8] Retrieved from http://www2.ed.gov/programs/rsabvrs/funding.html, on June 5, 2012.

State VR counselors coordinate the VR eligibility and service determination process. The determination process typically includes additional assessment regarding disability, a review of the consumer's history, and a mutually agreed-upon individual plan for employment (IPE) (Rubin and Roessler 2001). Using the IPE as a guide, the VR counselor is expected to facilitate placement in competitive employment and help the client "maximize employability, independence, integration, and participation of people with disabilities in the workplace and the community" (Parker et al. 2005). Hence, for all applicants that complete an IPE, the IPE and subsequent VR services can be described as an intervention with an expectation or expected outcome of satisfactory performance in employment (Colling and Davis 2005). This does not necessarily mean engagement in SGA, however.

For eligible individuals, the VR agencies may offer information, services and supports (such as counseling), assistive technology, job accommodations, mental or physical restoration, prosthetic or orthotic devices, job-search/placement assistance, transportation, and personal assistance. Counselors also coordinate training-related services including vocational assessment and postsecondary education (including graduate-level coursework). Most VR services are provided at no cost to the individual, particularly when financial need is demonstrated (Rubin and Roessler 2001).

Based on the RSA 911 data, a substantial percentage of those accepted for VR services report a prior employment history, although this does not necessarily mean that they are disability insured. The majority of these consumers exited with an employment outcome. Furthermore, 89.9 percent of VR cases closed in FY 2002 had not entered SSD as of the closure month.[9]

[9] Authors' calculations are based on the RSA 911 FY 2002.

III. LITERATURE REVIEW

Several studies have been conducted on VR client outcomes and SSD status. They have shown that there is substantial covariation between SSD status and VR employment outcomes, or between services provided to SSD beneficiaries and employment outcomes, but information on causal relationships is limited. Using a quasi-experimental design, Tremblay et al. (2006) found that use of specialized benefits counseling has a positive impact on the employment outcomes of VR clients with psychiatric disabilities who are on SSD. Using RSA 911 data, Rogers et al. (2005) found that job placement services caused a three-fold increase in competitive employment at closure for SSI and SSD beneficiaries. Researchers also have examined VR outcomes for SSD beneficiaries compared to non-SSD. For example, Stapleton and Erickson (2004) used the Longitudinal Study of the Vocational Rehabilitation Services Program (LSVRS) to show that clients who are SSD or SSI beneficiaries are much less likely than other clients to earn above the SGA earnings level even after controlling for many detailed, observed client characteristics.

Another strand of literature has examined how characteristics of workers with disabilities and access to employment services affect SSD entry. This research does not focus on VR services, however, and the identified relationships between services and SSD entry are not necessarily causal. For instance, Honeycutt and Brucker (2006) have considered social, environmental, and clinical traits that are predictive of SSD entry. There is a substantial literature on early intervention services provided to workers by workers' compensation insurers, private disability insurers, and disability management vendors—for example, McLaren et al. (2010) and Habeck et al. (2010). In general, these studies show that employer-based policies and programs, particularly at large firms, are effective in retaining employees who would otherwise exit jobs due to health or disability reasons.

One recent study, the Demonstration to Maintain Independence and Employment (DMIE), used rigorous experimental methods to estimate the impact of enhanced medical and person-centered case management services that "wraparound" usual health care services on employment and benefit outcomes for workers not initially receiving SSD or SSI benefits. In two of the four demonstrations that had comparable interventions and relatively large sample sizes (in Minnesota and Texas), Whalen et al. (2012) found that the treatment group subjects were significantly less likely to receive SSD or SSI within one year after enrollment—1.8 percent versus 3.2, a reduction of over 40 percent. Point estimates of impacts for other states and for SSD entry alone were consistent with this finding but were not statistically significant. Estimates for impacts on employment and earnings were all insignificant and of mixed signs.

Most of the evidence of success with early intervention services is based on services delivered before the worker's employment is terminated. Its applicability to VR services is very unclear, because VR agencies rarely reach out to employers with the intent of helping their workers immediately following disability onset.[10] Nor does there appear to be any other evidence on SSD entry following VR application, let alone on the efficacy of VR services in helping clients stay in the labor force and become reliant on SSD.

[10] Alabama's Retaining A Valued Employee (RAVE) program is a notable exception, but we have found no rigorous evidence on its effectiveness.

This study addresses a gap in the research literature on characteristics and traits related to SSD entry after application for VR services. Researchers have previously examined how VR client characteristics, including program status while receiving VR services, are related to employment outcomes at VR closure, but to our knowledge no one has considered SSD outcomes for those not already receiving SSD.

IV. METHOD AND SAMPLE DESCRIPTION

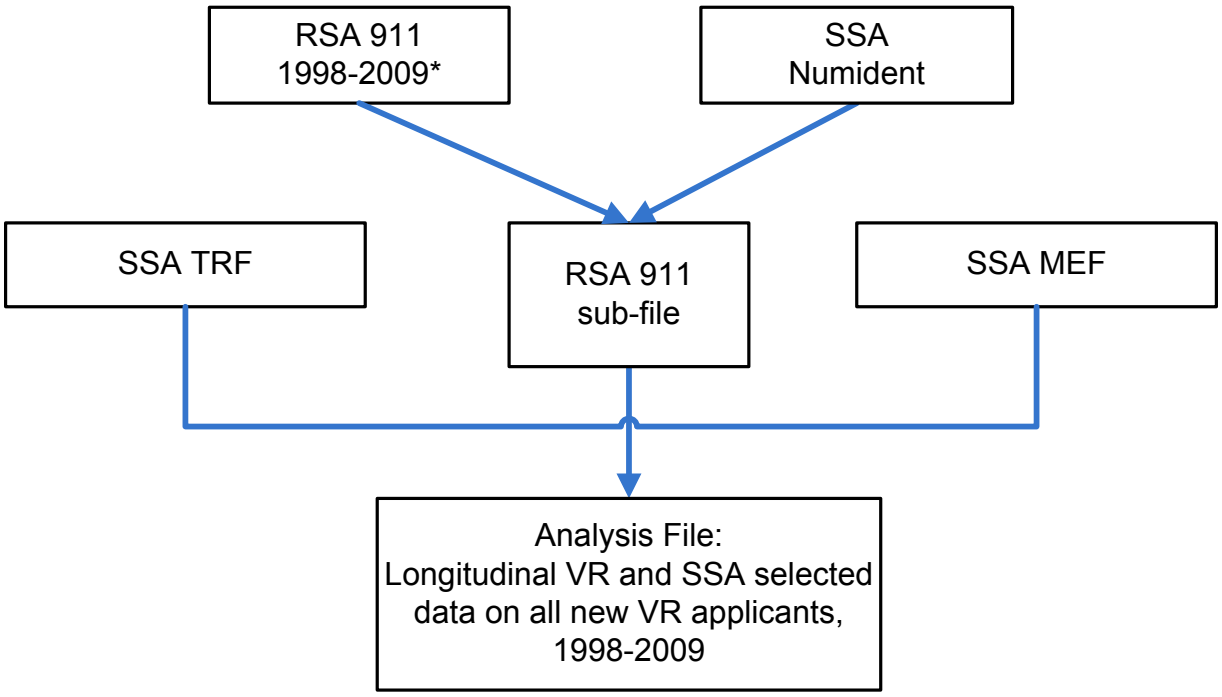
In this study, we used RSA 911 closure records for the years 1998 through 2009 matched to records from SSA's Numident File, Ticket Research File (TRF), and Master Earnings File (MEF). We first provide information on the source files and the processes for matching data records and conducting analyses; provision of the latter was complicated by restrictions on data access necessary to comply with privacy laws and regulations. We then describe the analytic data file constructed from these records and discuss issues with some of the administrative variables. Finally, we consider the statistical methods used to produce the findings in this document.

As Figure IV.1 illustrates, we identified participants using the RSA 911 administrative data, which are compiled on an annual basis and include state level data on all VR applicants, case closures, services, and outcomes. We used the SSA Numident, the official record of all Social Security numbers (SSNs), to verify the SSNs in the RSA 911 file, excluding records for second or later occurrences of the same SSN. Using the validated SSNs, we submitted a finder file for the Master Earnings File (MEF), longitudinal records of earnings data based on tax reports. We used the MEF solely to determine disability insurance (DI) eligibility. Finally, we matched the subfile to the 2009 version of the TRF (TRF09), which includes a record for every individual age 18 to 65 who received an SSD benefit in at least one month since 1996. Among other data, the TRF includes data on monthly benefits, demographic characteristics, primary impairment, TWP status, and months with no benefits following suspension or termination for work. The TRF and MEF are restricted-use data sets. Hildebrand and others (2009) provide full documentation on the TRF09.[11]

We provide details of the data extracted from each of the source files for each matched record in the appendix. Briefly, for the RSA 911, we extracted demographic (e.g., race, age, gender) information, programmatic information (such as application, IPE and closure dates), and state agency. We used the Numident to validate the identification information in the 7,457,183 records from the RSA 911, on the basis of SSN, sex and date of birth. Cases that do not match (4.9 percent of those submitted—367,696) are not included in the analysis file. Data from the TRF include month of first SSD payment, which we used to determine whether the VR applicant had been first paid a benefit during or before the VR application month, during or before the applicant's closure month, and as of the end of 12-month intervals after the month of VR application, up to 60 months. A qualified SSA employee used the MEF record to determine whether the VR client was disability insured as of the VR application month. The final analysis file includes one record for each unique VR applicant from 1998 to 2005 (N = 3,656,105). Many of the statistics presented are for the FY 2002 applicants, of which there are 480,566 in the file.

[11] Starting with the 2011 update, the new name for the TRF is the Disability Analysis File (DAF).

Figure IV.1. Construction of Analysis File



*New cases only, no previous closures.

Many VR applicants have received VR services in the past. Our interest is in "new" applicants—those applying for services for the first time—and their later experiences. Hence, we excluded records from the analyses files if there was evidence of earlier VR application or service receipt. Two types of evidence were available. The RSA 911 includes a field for previous closure, and we excluded records that indicated previous closure within 36 months of the date of application. In addition, some applicants had multiple applications in our sample period, in which case we included only the first. The data could be used to study repeat clients—that is, repeated use of VR services by a client over the sample period—but we have not done so for this paper.

There are a number of known problems with the data. First, a small share of first-time applicants from this period, especially in the most recent years, was excluded because their first cases had not closed by the end of 2009. Second, we cannot be sure that all remaining records are for individuals who were applying for VR services for the first time. This is likely a more significant problem for the early years of the sample period (i.e., FY 2000 and before) than for the later years, as in later years we are able to directly observe the recent history of VR application for each applicant rather than rely on the RSA 911 information for closures in the last three years.

Third, for those awarded SSD benefits, we cannot be certain whether they first received a primary award as a disabled worker or as a DAC or DWB. Instead, we know only their most recent reported status. This likely results in some errors in classification across status categories as of the application month as some beneficiaries find it advantageous to change their status following the initial SSD award. For instance, a young disabled worker can become dually entitled as a DAC status when a parent claims retirement benefits. In our data, such beneficiaries are counted as DAC, but they might not have been DAC at the time of VR application.

Once we created the matched records for new VR applicants, we sorted them according to calendar year of application, creating annual cohorts of new VR applicants. Each statistic presented in later sections is based on the sample for the annual cohort indicated. Most of the statistics presented are means or percentages for the population of all individuals in the applicant cohort indicated, not estimates of those values based on a sample. Hence, we do not present standard errors.

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V. SSD AWARD EXPERIENCE OF ANNUAL VR APPLICANT COHORTS FOR 1998 THROUGH 2005

In this section, we present longitudinal SSD award statistics for annual cohorts of new VR applicants for 1998 through 2005. For each cohort, we present statistics on the number and percentage awarded SSD in the month of VR application or earlier, as of VR closure, and as of the end of 12-month intervals after the month of VR application. To the extent they have been observed, we also compare the longitudinal percentages across the cohorts.

Detailed SSD award statistics are presented in Table V.1. Each statistic is cumulative; that is, it indicates whether an SSD award ever was made to the applicant in or before the month indicated. If an award was made in the past but SSD benefits were suspended or terminated in or before the month indicated, as is true in a small minority of cases, the applicant is still counted as having entered SSD. The percentages ever having received an SSD award are plotted in Figure V.1.

For all cohorts with 72 months of data post-application, we found the overall percentage of VR applicants entering SSD after VR application (12 months to 72 months) ranged from 12.6 percentage points to 13.7 percentage points (Table V.1). There is a substantial positive trend across successive cohorts in the percentage having entered SSD as of VR application and a positive, but lower, increase in the percentage having entered as of closure. For each cohort, the largest 12-month increase in SSD awards occurred in the first 12 months after VR application. The cohorts for years 1998 through 2000 show the largest percentage increases as of the 12^{th} month. After 24 months, the percentage of new VR applicants receiving an SSD award in each cohort increases by approximately 1 to 2 percentage points per year.

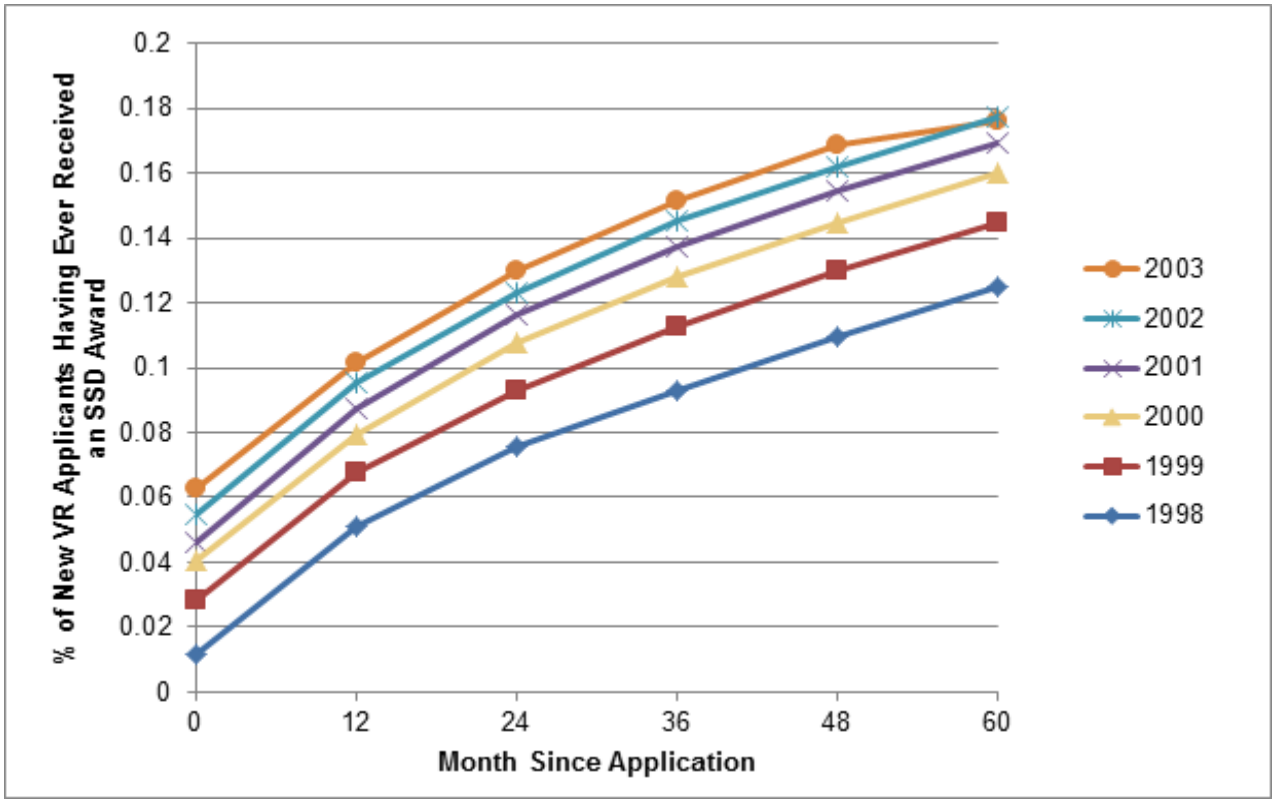
Figure V.1 plots data on the 1998 through 2003 cohorts over the 60 months after VR application. We exclude the later cohorts because incomplete processing of their SSD applications might affect their SSD entry statistics for later months. Using the 1999 trend line as an example, 2.8 percent (13,604) of the new VR applicants had entered SSD as of the month of application. The percentage having entered SSD increased rapidly during the first 36 months, rising to 14.5 percent by 60 months after VR application. Figure V.1 also shows an increase in the annual trend in the percentage having entered SSD by the time of VR application, from 1.2 percent for the 1998 cohort to 6.3 percent for the 2003 cohort, with an approximately equal increase as of 60 months after VR application (from 12.5 percent to 17.6 percent). The fact that the percentage at 60 months for the 2003 cohort is slightly lower than the corresponding value for the 2002 cohort might reflect longer than usual processing times for SSD applications following a recession-induced surge in applications that started in 2008.

Table V.1. The Number and Percentage of New VR Applicants Ever Having Received an SSD Award as of the VR Application Month; Months 12, 24, 36, 48, 60, and 72 Since Application; and at VR Closure, by Application Year

Application Year	At Application		At 12 Months		At 24 Months		At 36 Months		At 48 Months		At 60 Months		At 72 Months		At Closure	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
1998	5,945	1.2%	25,910	5.1%	38,373	7.6%	46,995	9.3%	55,548	11.0%	63,315	12.5%	70,167	13.8%	32,932	6.5%
1999	13,604	2.8%	33,024	6.8%	45,169	9.3%	54,852	11.3%	63,124	13.0%	70,430	14.5%	77,282	15.9%	39,363	8.1%
2000	19,306	4.0%	38,153	8.0%	51,484	10.7%	61,458	12.8%	69,314	14.5%	76,642	16.0%	83,244	17.4%	44,676	9.3%
2001	22,085	4.6%	42,015	8.8%	55,921	11.7%	65,836	13.7%	74,136	15.5%	81,293	17.0%	87,793	18.3%	48,279	10.1%
2002	26,344	5.5%	45,876	9.5%	59,215	12.3%	69,745	14.5%	77,971	16.2%	85,376	17.8%	88,696	18.5%	49,328	10.3%
2003	28,136	6.3%	45,569	10.2%	58,182	13.0%	67,835	15.1%	75,556	16.8%	78,965	17.6%			49,712	11.1%
2004	30,264	7.4%	45,750	11.2%	56,510	13.8%	65,284	15.9%	69,068	16.8%					48,479	11.8%
2005	28,879	7.9%	42,120	11.5%	51,277	14.1%	55,268	15.2%							42,791	11.7%

Sources: RSA 911 and TRF.

Figure V.1. Percentage of New VR Applicants Ever Having Received an SSD Award as of VR Application Month and Months 12, 24, 36, 48, and 60 Since Application, by Application Year



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VI. VR APPLICANT CHARACTERISTICS AND SSD STATUS

In this section, we present findings on the relationship between new VR applicant characteristics and SSD status at application, at closure, and 60 months after closure. We focus on the 2002 new applicant cohort because 2002 is the first year that changes in the RSA 911 data requirements were fully implemented (RSA 2002). Characteristics at VR application include socioeconomic and disability characteristics observed in the RSA data, SSI entry, state of application, disability insured status, and SSD entry.

Statistics on the demographic and socioeconomic characteristics of this cohort appear in Tables VI.1 and VI.2. For those with each characteristic, we also report the percentage ever awarded SSD at application, closure and 60 months after application. As Table VI.1 indicates, the majority of VR applicants were male (55 percent), most were non-Hispanic white (64.3 percent), and over 40 percent were under age 30. Among racial or ethnic groups, Hawaiians and Pacific Islanders were the least likely ever to receive SSD after VR application and non-Hispanic whites were the most likely. VR applicants ages 50 through 59 had the largest percentage increase in SSD entry between time of application and closure, and were most likely to receive SSD at 60 months. As anticipated, VR applicants employed at time of application were less likely to have entered SSD as of application, closure, or 60 months after application.

The higher the level of education at application, the more likely the applicant had already entered SSD, or had done so as of closure and at 60 months. For example, 5.8 percent of VR applicants with a high school diploma had already entered SSD compared to 9.8 percent of those with a bachelor's degree; at 60 months both figures are higher, and the difference is larger—19.2 percent for high school graduates and 26.2 percent for those with bachelor's degrees.[12]

Among those who entered SSI by the time of VR application, a large percentage (28 percent) had also entered SSD as of application (Table VI.2). That figure increases to 50 percent at closure and 94 percent at 60 months. Although some might have entered SSD as DAC or DWB, it seems likely that many earned enough to become disability insured; the fact that they applied for VR indicates intent to work. It might be that they attained disability insured status without achieving earnings above the SGA level or had a reduction in earnings after becoming disability insured.

Only a little over half of applicants were already disability insured, and a very large majority of applicants observed entering SSD at some point in our sample period are in this group. Some SSD entrants were not classified as disability insured at the time of VR application—including 2.9 percent who had been awarded SSD previously. DAC/DWB eligibility likely explains SSD entry for some of these applicants. One other explanation is that the algorithm used to determine disability insured status is based on earnings only, and some of those who had entered SSD as disabled workers in advance of VR entry might not have had sufficient earnings in recent years

[12] Given that education level might increase during the period of VR service, perhaps with the agency's support, the relationship of education at closure and SSD entry is also of some interest. We found that the higher the level of education at closure, the more likely the applicant had already entered SSD. For example, 5.1 percent of VR applicants with a high school diploma had already entered SSD compared to 8.7 percent of those with a bachelor's degree; at 60 months both figures are higher, and the difference is larger—17.7 percent for high school graduates and 22.8 percent for those with bachelor's degrees.

to maintain disability insured status. Those who enter SSD after application might have achieved disability insured status at a later date.

Table VI.1. Demographic Characteristics of the 2002 New VR Applicant Cohort and Percentage Ever Awarded SSD as of Application, Closure, and 60 Months After Application

	VR Applicants		SSD as of Application		SSD as of Close		SSD as of 60 Months	
	Number	%	Number	%	Number	%	Number	%
All Applicants	**480,566**		**26,344**	**5.5%**	**49,328**	**10.3%**	**85,376**	**17.8%**
Race/Ethnicity								
White	308,996	64.3%	17,237	5.6%	33,941	11.0%	59,018	19.1%
Black	106,671	22.2%	6,033	5.7%	10,080	9.4%	16,944	15.9%
Hispanic	5,649	1.2%	273	4.8%	473	8.4%	864	15.3%
American Indian	4,892	1.0%	329	6.7%	580	11.9%	882	18.0%
Asian	1,487	0.3%	102	6.9%	170	11.4%	234	15.7%
Hawaiian or Pacific Islander	19,079	4.0%	766	4.0%	1,084	5.7%	2,570	13.5%
Multiple race	32,393	6.7%	1,505	4.6%	2,868	8.9%	4,577	14.1%
Missing	1,399	0.3%	99	7.1%	132	9.4%	287	20.5%
Gender								
Male	265,677	55.3%	14,132	5.3%	27,253	10.3%	46,674	17.6%
Female	214,889	44.7%	12,212	5.7%	22,075	10.3%	38,702	18.0%
Age								
Under 18	43,033	9.0%	0	0.0%	1,283	3.0%	2,298	5.3%
18-29	151,169	31.5%	6,527	4.3%	11,117	7.4%	18,669	12.3%
30-39	98,542	20.5%	6,297	6.4%	10,875	11.0%	18,124	18.4%
40-49	112,121	23.3%	7,346	6.6%	13,871	12.4%	25,174	22.5%
50-59	58,362	12.1%	4,938	8.5%	10,365	17.8%	18,805	32.2%
60-FRA	17,339	3.6%	1,236	7.1%	1,817	10.5%	2,306	13.3%
Employment Status								
Employed	92,417	19.2%	2,040	2.2%	4,877	5.3%	11,073	12.0%
Not employed	381,941	79.5%	24,008	6.3%	44,094	11.5%	73,378	19.2%
Missing	6,208	1.3%	296	4.8%	357	5.8%	925	14.9%
Disability-Insured Status								
Yes	245,348	51.1%	19,639	8.0%	31,889	13.0%	48,321	19.7%
No	235,218	48.9%	6,705	2.9%	17,439	7.4%	37,055	15.8%
Education at Application								
No formal education	2,035	0.4%	89	4.4%	167	8.2%	341	16.8%
8th grade or less	20,889	4.3%	803	3.8%	1,645	7.9%	3,349	16.0%
9th-12th grade, no diploma	136,780	28.5%	4,251	3.1%	8,557	6.3%	15,997	11.7%
Special-education certificate	28,310	5.9%	1,371	4.8%	2,361	8.3%	4,341	15.3%
High school graduate or GED	173,439	36.1%	9,973	5.8%	18,792	10.8%	33,341	19.2%
Post-secondary education, no degree	63,084	13.1%	4,890	7.8%	8,778	13.9%	13,923	22.1%
Associate's or vocational/ technical certification	26,264	5.5%	2,197	8.4%	4,131	15.7%	6,709	25.5%
Bachelor's degree	20,248	4.2%	1,986	9.8%	3609	17.8%	5,306	26.2%
Master's degree or higher	6,177	1.3%	641	10.4%	1116	18.1%	1,613	26.1%
Missing	3,340	0.7%	143	4.3%	172	5.1%	456	13.7%
Education at Close								
No formal education	1,824	0.4%	77	4.2%	139	7.6%	304	16.7%
8th grade or less	16,406	3.4%	656	4.0%	1,344	8.2%	2,767	16.9%
9th-12th grade, no diploma	85,594	17.8%	3,046	3.6%	5,804	6.8%	11,233	13.1%
Special-education certificate	32,345	6.7%	1,470	4.5%	2,601	8.0%	4,826	14.9%
High school graduate or GED	183,465	38.2%	9,284	5.1%	17,815	9.7%	32,537	17.7%

Table VI.1 *(continued)*

	VR Applicants		SSD as of Application		SSD as of Close		SSD as of 60 Months	
	Number	%	Number	%	Number	%	Number	%
Post-secondary education, no degree	72,749	15.1%	5,123	7.0%	9,619	13.2%	14,954	20.6%
Associate's or vocational/ technical certification	39,359	8.2%	2,916	7.4%	5,557	14.1%	8,534	21.7%
Bachelor's degree	25,820	5.4%	2,244	8.7%	4,167	16.1%	5,895	22.8%
Master's degree or higher	7,276	1.5%	732	10.1%	1,301	17.9%	1,820	25.0%
Missing	15,728	3.3%	796	5.1%	981	6.2%	2,506	15.9%

Sources: RSA 911 2002, MEF, and TRF.

Note: There were no people who were both under age 18 and an SSD beneficiary at the time of VR application.

Table VI.2. Employment and Program Status of the 2002 New VR Applicant Cohort and Percentage Ever Awarded SSD as of Application, Closure, and 60 Months After Application

	VR Applicants		SSD as of Application		SSD as of Close		SSD as of 60 Months	
	Number	%	Number	%	Number	%	Number	%
All Applicants	**480,566**		**26,344**	**5.5%**	**49,328**	**10.3%**	**85,376**	**17.8%**
Employment Status								
Employed	92,417	19.2%	2,040	2.2%	4,877	5.3%	11,073	12.0%
Not employed	381,941	79.5%	24,008	6.3%	44,094	11.5%	73,378	19.2%
Missing	6,208	1.3%	296	4.8%	357	5.8%	925	14.9%
SSI Status (at VR application)								
Never	460,721	95.9%	20,711	4.5%	39,442	8.6%	66,732	14.5%
Current Pay	14,701	3.1%	4,154	28.3%	7,248	49.3%	13,837	94.1%
1619(b)	2,712	0.6%	774	28.5%	1,421	52.4%	2,533	93.4%
Other suspense/termination	2,432	0.5%	705	29.0%	1,217	50.0%	2,274	93.5%
Disability-Insured Status								
Yes	245,348	51.1%	19,639	8.0%	31,889	13.0%	48,321	19.7%
No	235,218	48.9%	6,705	2.9%	17,439	7.4%	37,055	15.8%
SSD Status (at VR application)								
SSD entered	26,344	5.5%	26,344	100.0%	26,344	100.0%	26,344	100.0%
Disabled worker[a]	23,542	4.9%	23,542	100.0%	23,542	100.0%	23,542	100.0%
DAC/DWB[a]	2,802	0.6%	2,802	100.0%	2,802	100.0%	2,802	100.0%
SSD not entered	454,222	94.5%	-	0.0%	22,984	5.1%	59,032	13.0%
Disabled worker[a,b]	-	0.0%	-	0.0%	21,362	4.7%	55,719	12.3%
DAC/DWB[a,b]	-	0.0%	-	0.0%	1,622	0.4%	3,313	0.7%

Sources: RSA 911, MEF, and TRF.

[a]Classification as DAC/DWB is based on most recent status reported in the TRF, and some VR applicants who were disabled workers as of the application month might have subsequently attained DAC/DWB status.

[b]The base for percentages in this row is the total number of applicants in the SSD Not Entered category.

To investigate this further, we produced descriptive statistics for the 46,348 individuals (1.3 percent) across all cohort years (1998 through 2005) who had received an SSD award but were not disability insured at time of VR application (Appendix A).[13] These statistics suggest that many are DAC. We would expect DAC entrants to be relatively young, and compared to the 2002 VR new applicants, these entrants are (nearly 50 percent are age 29 or younger compared to 40 percent in the 2002 cohort).

Figure VI.1 displays cumulative SSD entry statistics by state of VR application. The bottom bar for each state indicates the percentage ever awarded SSD at application, the middle bar shows the additional percentage awarded SSD by the closure month, and the top bar shows the additional percentage awarded SSD through month 60 after application. The states have been ordered according to the percentage ever awarded SSD through the month 60. Puerto Rico, South Carolina, Utah and the District of Columbia are at the low end of the spectrum, with under 15 percent having entered SSD through month 60. Maine, Massachusetts, and New Hampshire are at the high end, with approximately 30 percent—more than twice as high as those with the lowest percentages. Among the larger states, Texas and New York have relatively lower rates of SSD entry. Appendix B shows the detailed statistics for each state.

The final set of statistics in Table VI.2 is for SSD status as of VR application. Here we differentiate between disabled workers and DAC/DWB as of the most recent status in the TRF09. That status might have changed since VR application; specifically, some disabled workers might have become DAC/DWB.[14] The table shows that at most only a very small share of applicants had entered SSD already in DAC/DWB status (0.6 percent); over eight times as many (at least 4.9 percent) had already entered SSD as disabled workers. Those who entered SSD only after application were much more likely to be in the disabled worker category than in DAC/DWB status; for instance, at 60 months 0.7 percent of this group had entered as DAC/DWB at most (given the possible classification change), whereas at least 12.3 percent had entered as disabled workers.

Statistics for the primary impairment reported by the VR agency appear in Table VI.3. A majority of first-time VR applicants in 2002 were reported to have a cognitive impairment (22.6 percent), a psychosocial impairment (19.3 percent), or other mental impairment (10.4 percent). However, smaller groups were the most likely to receive SSD at each time point: those reported to have general physical debilitation, blindness, or mobility and/or manipulation impairments. Those in the various deafness/hearing loss categories were less likely than others to have entered SSD at each time point, although those reported to have deafness and communicate primarily by visual means were about twice as likely as others with deafness or hearing loss to have entered SSD by the 60th month after application.

[13] Authors calculation based on analysis file N= 3,656,105.

[14] Our understanding is that changes in the other direction do not occur, even if the beneficiary becomes disability insured.

Figure VI.1. Percentage of the 2002 New VR Applicant Cohort Ever Awarded SSD at Application, Closure, and 60 Months after Application, by State of Application

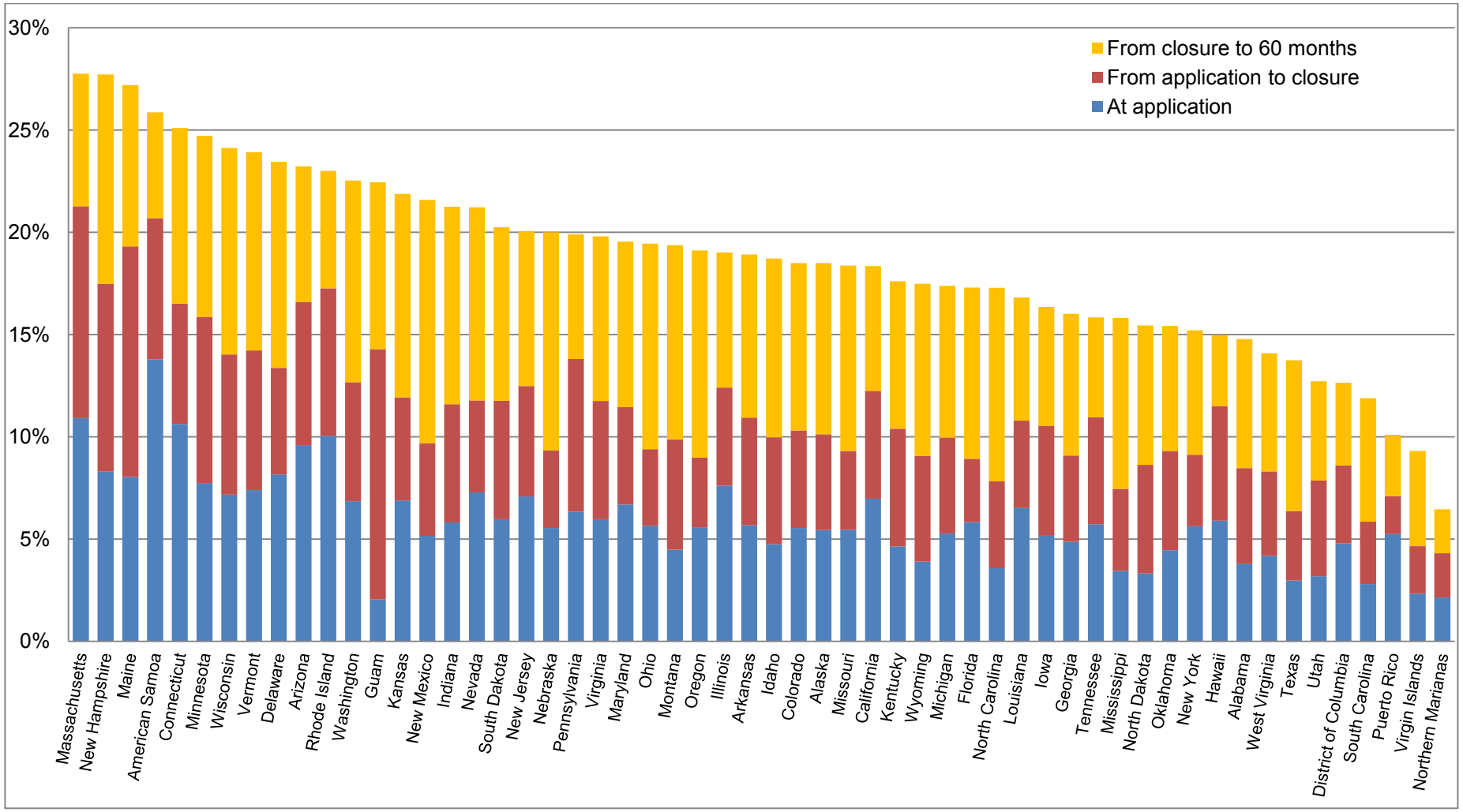

Table VI.3. Primary Disabilities of the 2002 New VR Applicant Cohort, by Ever SSD Award Status at Application, Closure, and 60 Months After Application

	VR Applicants		At Application		At Close		At 60 Months	
	Number	%	Number	%	Number	%	Number	%
All Applicants	**480,566**		**26,344**	**5.5%**	**49,328**	**10.3%**	**85,376**	**17.8%**
VR Disability Status								
No impairment	9,304	1.9%	263	2.8%	318	3.4%	1,118	12.0%
Blindness	9,923	2.1%	1,032	10.4%	2,098	21.1%	2,611	26.3%
Other visual impairment	10,769	2.2%	509	4.7%	1,259	11.7%	2,335	21.7%
Deafness, primary communication visual	4,083	0.8%	263	6.4%	648	15.9%	917	22.5%
Deafness, primary communication auditory	1,970	0.4%	42	2.1%	130	6.6%	241	12.2%
Hearing loss, primary communication visual	2,412	0.5%	56	2.3%	126	5.2%	265	11.0%
Hearing loss, primary communication auditory	12,770	2.7%	132	1.0%	353	2.8%	1,005	7.9%
Other hearing impairments	988	0.2%	21	2.1%	46	4.7%	89	9.0%
Deaf-blindness	255	0.1%	11	4.3%	24	9.4%	40	15.7%
Communicative impairments	3,486	0.7%	156	4.5%	319	9.2%	508	14.6%
Mobility orthopedic/neurological impairments	30,964	6.4%	2,415	7.8%	5,040	16.3%	8,324	26.9%
Manipulation/dexterity orthopedic/ neurological impairments	14,255	3.0%	685	4.8%	1,691	11.9%	3,163	22.2%
Both mobility and manipulation/dexterity/ orthopedic/neurological impairments	17,445	3.6%	1,777	10.2%	3,609	20.7%	5,559	31.9%
Other orthopedic impairments	29,651	6.2%	1,592	5.4%	3,575	12.1%	7,037	23.7%
Respiratory impairments	4,886	1.0%	392	8.0%	673	13.8%	1,128	23.1%
General physical debilitation	14,270	3.0%	1,500	10.5%	2,446	17.1%	3,851	27.0%
Other physical impairments	36,855	7.7%	2,930	8.0%	4,879	13.2%	8,234	22.3%
Cognitive impairments	108,579	22.6%	3,554	3.3%	6,856	6.3%	12,073	11.1%
Psychosocial impairments	92,544	19.3%	6,061	6.5%	10,573	11.4%	16,820	18.2%
Other mental impairments	50,150	10.4%	1,907	3.8%	3,354	6.7%	6,052	12.1%
Missing	25,007	5.2%	1,046	4.2%	1,311	5.2%	4,006	16.0%

Sources: RSA 911 2002 and TRF.

VII. POTENTIAL APPROACH TO ESTIMATING THE IMPACT OF VR SERVICES

In this section, we assess the theoretical impact of VR services on SSD award under current policy. We then consider the possibility of using exogenous variation in waiting time for VR services to estimate the impact of delay in VR service delivery on SSD award.

A. Theory

In this section, we review the theoretical effects of VR service delivery on SSD award. For reasons that are complex, the theoretical direction of the impact of VR service delivery on SSD award is ambiguous for those clients not receiving either SSI or SSD at the time they apply for VR services. In principle, VR services could help those VR applicants not on SSD who nonetheless meet SSD medical and non-medical eligibility criteria to engage in SGA instead of applying for and obtaining SSD benefits. Such an outcome seems likely if, in fact, the client is capable of engaging in SGA, is sufficiently motivated to do so, and receives services in a timely and efficacious manner.

Not all clients who might meet SSD eligibility criteria are sufficiently capable or motivated, however. Some will not be able to engage in SGA at all, even with assistance from a VR agency. Some able to engage in SGA might not be motivated to do so because they are not able to earn much above the minimum SGA amount in the local labor market, or because the opportunity cost of work might be very high. The opportunity cost of working could be high for many reasons: they might need extra time every day to take care of themselves because of an impairment or medical condition; they might face significant impairment-related work expenses, such as transportation costs or the need for special equipment; SGA might pose risks to their health; or they might also have attractive alternative uses for their time, such as caring for a family member. For such a client, receipt of SSD benefits, perhaps coupled with a job that does not constitute SGA, might be a better option than engaging in SGA and not receiving SSD benefits. In such situations, VR services might accelerate the client's entry into SSD, perhaps by helping the client understand SSD rules and obtain a job that does not represent SGA.

VR counselors could potentially help those on the margin between (1) engaging in SGA versus (2) not engaging in SGA and entering SSD to choose the latter option. VR agencies, however, have an incentive to help the client enter SSD and then help and encourage the client to engage in SGA. This is because SSA will potentially pay the VR agency for services provided to an SSD (or SSI) beneficiary, provided that the client engages in SGA for some period thereafter, but will not pay for services provided to non-beneficiaries. For the VR agency to be eligible for a payment from SSA, however, the client must first obtain eligibility for SSD (or SSI) benefits. Otherwise, the agency must pay for the services from federal Rehabilitation Act funds and matching state funds.

Under SSA's cost-reimbursement payment system, SSA will reimburse the VR agency for service costs, up to a limit, provided the client engages in SGA for 9 months. Because of the SSD 9-month TWP and 3-month grace period, this does not necessarily mean suspension of SSD benefits. VR agencies also have the option of using one of the recently established Ticket-to-Work (TTW) payment systems, rather than cost reimbursement. In 2012, VR agencies exclusively use the milestone-outcome payment system. Under this system, they may receive some milestone payments for months in which the client is working but not engaged in SGA.

Total milestone payments are limited, however, after which outcome payments are available only if the client earns enough for SSA to suspend the client's SSD benefits.

It is not obvious that the prospect of SSA payments actually induces VR agencies to encourage and help non-beneficiary clients to become beneficiaries. It is no simple matter to ensure that SSA will pay the agency for services delivered. Further, the VR agency's interest in obtaining SSA payments is likely to depend on the adequacy of Rehabilitation Act funding and the state's match.

VR services are perhaps much more likely to lead to SSD entry for VR clients who might meet SSD medical eligibility criteria but are not eligible for SSD because they are not disability insured—especially if they are young. This includes clients already receiving SSI and who are therefore known to meet the SSD medical eligibility criteria. The mechanism is simple: the VR agency might help the client become both fully insured and disability insured, after which the client would automatically be eligible for SSD. As described earlier, for those under age 24, this status can currently be achieved by earning the equivalent of $4,520 in one calendar year and $2,260 in a second calendar year—far less than the equivalent to the monthly SGA amount over the same period. Although meeting the fully insured and disability-insured requirements will be challenging for some VR clients who meet SSA's medical eligibility criteria, even if they are young, the very fact that they are applying for VR services suggests interest in and ability to achieve at least a low level of earnings. The fact that 94 percent of those 2002 new VR applicants who had already entered SSI also entered SSD as of month 60 after application is consistent with these observations.

There is another strong incentive for VR clients who are not disability insured to obtain SSD benefits—they will become eligible for Medicare 24 months after SSD entry. This is especially true for those who are not insured or who will lose their eligibility under a parent's plan in the near future. For those already receiving Medicaid—often by virtue of the fact they are receiving SSI—this incentive is not necessarily strong because Medicaid pays for a much broader range of services, including those that help the individual to maintain his or her functional ability. Medicare might, however, provide the individual with better access to specialty and acute care because of less restrictive payment rates and utilization controls.

Perhaps more important for VR clients who are enrolled in Medicaid, the state has a financial incentive to help the client obtain Medicare. The state pays a share of Medicaid expenditures, whereas Medicare is funded entirely by the federal government. As Medicaid is always the payer of last resort, the client's enrollment in Medicare will reduce the state's Medicaid expenditures. An analogous statement applies to state-funded mental health services.

Based on the above, we expect VR services to (1) reduce or delay SSD entry for those meeting SSD eligibility criteria but who are capable of earning well above the SGA amount with the assistance of VR services; (2) increase or accelerate SSD entry for those meeting SSD eligibility criteria but who are not capable of earning well above the SGA amount even with the assistance of VR services; and (3) increase or accelerate SSD entry for those meeting SSD medical eligibility criteria but not SSD non-medical eligibility criteria.

B. Impact Estimation

Estimation of the impact of VR service delivery on SSD entry is problematic because of the difficulty of establishing an appropriate comparison group for VR applicants. VR applicants are self-selected; that is, the applicants have made the decision to apply for services. Presumably, they are more motivated or able to work than individuals who might otherwise appear comparable. Some researchers have tried to address this challenge by comparing the VR group receiving services to VR-eligible clients whose cases are closed without receiving services (Dean et al. 1991).

Another strategy is to reframe the research question to focus on delays in service delivery that are beyond the VR applicant's controls. If VR services delay or accelerate SSDI participation, then exogenous delays in delivery of services to VR applicants presumably would have the opposite effect—to accelerate or delay SSD entry. Estimation of the effect of delay in service delivery on SSD entry requires data on VR applicants covering a period where substantial exogenous variation in a reliable measure of the duration from application to service delivery.

The best measure of duration from VR application to service delivery available in the RSA 911 data appears to be the duration from the application date to the date of completion of an IPE. The IPE is required by federal regulations and represents the first completed step in the service delivery process. Although available for all states, cross-state variation in the administrative use of the IPE likely reduces comparability of duration to IPE across states.

There are a number of sources of variation in duration to IPE, both within and across states. Within-state sources include variability over time in the availability of counselors and other agency resources relative to the number of applicants, variability in service delivery across offices and counselors, and variability in client characteristics and behaviors. When an agency is unable to serve all applicants, it operates under "order of selection," serving those with the most significant disabilities first (including those already receiving SSD or SSI) and serving those with less significant disabilities only after a delay, if ever. Many applicants have their cases closed without an IPE. For some, this is because the agency found them ineligible for services. Others fail to return to the agency even after they have been determined to be eligible for services, for reasons often not known to the agency.

The data for the 2002 new VR applicants demonstrate that, in fact, there is substantial total variation in duration to IPE within a single year (Table VII.1, first column). Almost 36 percent of applicants had an IPE within three months of application, and an additional 10 percent had one within six months. Another 11 percent received an IPE before closure, but some took longer than three years. Almost 43 percent of the cases were closed without completion of an IPE. The latter group includes applicants whom the agency determined were ineligible for services, as well as those who were eligible but whose cases were closed without receiving any services.

Table VII.1. Duration from Application to IPE for the 2002 New VR Applicant Cohort and Percentage Ever Awarded SSD, as of VR Application Month, Closure, and 60 Months After Application

	Not SSD as of Application		SSD as of Close		SSD as of 60 Months	
	Number	%	Number	%	Number	%
Total	**454,222**	**100.0%**	**22,984**	**5.1%**	**59,032**	**13.0%**
Months to IPE						
0 to 3	161,921	35.6%	8,813	5.4%	19,194	11.9%
4 to 6	47,304	10.4%	3,245	6.9%	6,147	13.0%
7 to 9	19,742	4.3%	1,525	7.7%	2,769	14.0%
10 to 12	9,869	2.2%	841	8.5%	1,423	14.4%
13 to 18	9,680	2.1%	887	9.2%	1,423	14.7%
19 to 24	4,300	0.9%	403	9.4%	594	13.8%
25 to 36	4,098	0.9%	444	10.8%	619	15.1%
37+	2,744	0.6%	324	11.8%	393	14.3%
Total with IPE	259,658	57.2%	16,482	6.3%	32,562	12.5%
No IPE	194,564	42.8%	6,502	3.3%	26,516	13.6%

Sources: RSA 911 2002 and TRF.

If delays in VR services accelerate (or decelerate) SSD entry, holding other things constant, we then would expect a positive (or negative) relationship between duration to IPE and entry into SSD in the period after VR application. Statistics in Table VII.1 (columns 2 and 3) show that, for those with an IPE at case closure, there is a positive relationship between duration to IPE and SSD entry following application, but clearly there is not enough evidence to attribute the observed relationship to the effect of VR service delay on SSD entry. At closure, the percentage having entered SSD increases monotonically with duration to IPE. Compared to those receiving an IPE within 3 months of application, those receiving an IPE more than 36 months after application are more than twice as likely to have entered SSD (11.8 percent versus 5.4 percent). At 60 months after application, the relationship months are less likely than others who received an IPE to have entered SSD, but differences are not large. While 11.9 percent of those receiving an IPE within 3 months of application had entered SSD, 14.3 percent of those receiving an IPE after 36 months had done so. The percentage having entered SSD as of 60 months does not increase monotonically with duration. One example of another factor that might lead to this positive relationship between duration to IPE and SSD entry is that it might systematically take VR agencies longer to develop IPE for applicants with more severe disabilities, and these are the applicants most likely to enter SSD.

If delay in VR service receipt accelerates (or decelerates) SSD entry, the impact presumably would be greatest for applicants who are never served. The direction of the relationship between closure without IPE and SSD entry depends on whether SSD entry is measured at closure or 60 months later. Applicants with closures without an IPE are less likely than all others to have entered SSD at closure (3.3 percent versus 6.3 percent) but are more likely than others to have entered SSD as of 60 months (13.6 percent versus 12.5 percent). This likely reflects the complex mix of cases closed without receiving services—including those determined ineligible because of insufficiently severe disabilities and those who decide they cannot pursue employment because of the severity of their condition, among others.

It is clear that applicant characteristics play a critical role in determining duration to IPE as well as SSD entry. Hence, any relationship between duration to IPE for an applicant and the likelihood of SSD entry will almost certainly reflect the applicants underlying characteristics. In econometric terminology, selection effects likely play a critical role in this relationship. Hence, the observed relationship between duration to IPE and SSD entry does not solely reflect the effect of duration on SSD entry.

One approach to addressing selection effects in this context is to create an instrumental variable for duration to IPE that affects applicant outcomes only through its effect on duration. If one or more such IV is available, an unbiased estimate of the impact of duration to IPE can be produced via IV regression.[15] We have identified one important, albeit imperfect, IV candidate that can be constructed from the RSA 911 data.

The IV for duration to IPE we identified reflects all factors that affect duration to IPE for those who initially apply for VR services in the same state and month as the applicant—*except for the applicant's own characteristics*. It is constructed by first grouping all new applicants in the sample period by state and month. To construct the value for an applicant, first remove the applicant's case from the applicant's state-month group, then order the duration to IPE for the remaining applicants from lowest to highest (with "no IPE" at the top), and find the value of duration to IPE below which a specified percentage all values lie (a percentile—for example, the median). By removing the applicant's own value for duration to IPE from the sample, we remove any effect the applicant's own characteristics might have on the selected percentile. Hence, the selected percentile is determined by factors that affect the duration to IPE for all applicants in the same state-month, but not the applicant's own characteristics.

For a separate study, we experimented with constructing this measure for VR applicants who were receiving SSD benefits at the time they applied for VR application, in 2005, except that we did not remove the applicant's own duration to IPE value when finding the relevant percentile.[16] We initially used the median for the percentile but found that almost one-third of applications were in state-month groups with a median of "no IPE"; that is, more the 50 percent of the applicants in these state-month groups had their cases closed without an IPE. For our 2002 sample in Table VII.1, it also seems likely that there would be a large share of state-month groups in which more than 50 percent of the applicants had their cases closed without an IPE, as 43 percent of all applicants in the sample had done so (Table VII.1). Our solution for the 2005 SSD applicant sample was to use the lower tertile—the percentile below which one-third of the values for duration to IPE lie—instead of the median. Although the choice of percentile is somewhat arbitrary, choosing a high percentile is problematic because of the large number of cases that close without an IPE, and choosing a very low percentile likely will lead to an IV with very limited variation—one not very reflective of the variation in factors that affect duration to IPE for all applicants in a state-month group.

Use of such an IV for duration to IPE would eliminate the effect of an applicant's individual characteristics on the estimated relationship between duration to IPE and SSD entry, it would not eliminate the effect of other factors that might affect duration to IPE for all applicants in a state-

[15] See, for instance, Greene (2012).

[16] See Honeycutt and Stapleton (2012).

month group *and* SSD entry—factors that will be confounded with the effect of waiting time on SSD entry in the simple relationship between duration to IPE and SSD entry. Of greatest concern is that the business cycle might appreciably affect both the duration to IPE and SSD entry. There is strong recent evidence that the business cycle affects SSD entry (Goss 2012). We are not aware of any systematic study of the impact of the business cycle on duration to IPE, but there are multiple reasons to expect a substantial relationship.

To illustrate, consider the effects of an economic downturn on VR application and service delivery. A downturn is likely to lead to job loss by some workers with disabilities (see Kaye 2010), and some of these are likely to seek help from state VR agencies in their efforts to return to work. In the absence of a timely capacity expansion, waiting times can be expected to increase. This effect would be exacerbated if government fiscal constraints brought on by the recession lead to a reduction in resources available to the VR agency. Unless the economy recovers very rapidly, the economic downturn is also likely to have an adverse impact on employment outcomes for VR clients, increasing the chance they will enter SSD. Hence, the business cycle could induce a positive relationship between the IV for duration to IPE and SSD entry, contrary to a requirement for an appropriate IV. If so, the IV estimate for the effect of duration to IPE on SSD entry would have a positive bias; that is, the estimate would reflect any effect of duration to IPE on SSD entry, compounded with a positive component reflecting the relationship between duration and SSD entry induced by the business cycle.

Thus, while the proposed IV likely would address bias due to individual characteristics that affect both duration to IPE and SSD entry, it might not be adequate to address bias due to other factors at the state-month level that affect both duration to IPE and SSD entry. Given the likely substantial effects of the business cycle on both duration to IPE and SSD entry, it is important to address the potential bias in some fashion.

One approach is to include measures for these factors as control variables. State fixed effects, the state's monthly employment rate, and measures of the size of an agency's fiscal year budget relative to the number of applicants over the same period are examples. If the proposed IV has no direct effect on SSD entry by VR applicants after controlling for such variables, it would be a suitable IV. Unfortunately, there is no way to test for the adequacy of such controls.

The 2007 recession and subsequent slow recovery might provide an excellent opportunity to study how the business cycle affects duration to IPE and SSD entry because of the extensive, observable state-level variation in other factors likely to affect both of these variables. It also might offer the opportunity to construct an additional IV. As mentioned earlier, we know from other research that the recession had a disproportionately large negative impact on employment of workers with disabilities and a substantial impact on SSD entry. We also know that the severity of the recession varied substantially across states, reflecting the uneven distribution of high-risk mortgages around the country among other things. In addition, the federal response included substantial new funding for VR services that was distributed unevenly across states, and in a manner not highly correlated with the extent of the state's recession.

We provide more information in Appendix C and discuss options for using the rich variation in the business cycle and VR funding during this period to help isolate the effects of exogenous delays in VR services on SSD entry. One important limitation in conducting an analysis for the period following the 2007 recession is that data will not be available until several years in the future. The RSA 911 data become available about 18 months after the end of the fiscal year. To

capture records for all applicants in 2008, it would be necessary to wait for the fiscal year 2013 data, which likely will not be available until early in 2015. It would be worthwhile to conduct an analysis of earlier periods now.

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VIII. SUMMARY AND CONCLUSION

Using matched RSA and SSA data, this study has produced longitudinal statistics on the percentage of VR applicants who enter SSD, and the timing of that entry relative to VR application. For the most recent annual applicant cohort for which there were data for 60 months after application (2003), we found that 6.3 percent of first-time applicants had received an SSD award before VR application, that the percentage having entered SSD had approximately doubled by VR closure (12.6 percent), and that 17.6 percent had entered SSD as of the 60th month following VR application. For earlier cohorts (as early as 1998), the percentage of first-time applicants having already received an SSD award was lower but grew by approximately the same amount over the next 60 months.

We also produced extensive statistics on how SSD entry varies with the characteristics of first-time VR applicants at the time of VR application. This analysis focused on the 2002 cohort, again followed for 60 months. Groups with relatively high SSD entry include non-Hispanic whites, those not employed at application, those with more than a high school education and, especially, those who had entered SSI as of the VR application date. For those in the 2002 cohort who entered SSI, 28 percent had also entered SSD as of VR application, 50 percent had entered SSD as of VR closure, and 94 percent had entered SSD as of 60 months after VR application. We also found wide variation in SSD entry across states; the percentage having entered SSD as of 60 months was about 15 percent for several states at the low end but was approximately twice as large for several states at the high end.

We also found that a small share of VR applicants who were not disability insured already had entered SSD. It appears that these applicants were either DAC beneficiaries or disability insured when they entered SSD but, based on earnings alone, no longer disability insured.

Finally, we produced statistics on a measure of VR waiting times for applicants in the 2002 cohort who had not yet entered SSD, and we considered the potential of the data to support an evaluation of the impact of waiting time on SSD entry. We measured waiting time as duration from application month to IPE and found wide variation in waiting time for the 2002 cohort; only 36 percent had an IPE within three months of application, another 10 percent had an IPE within six months, and 43 percent closed without an IPE (including those found ineligible for services). We also found a positive relationship between duration to IPE and entry into SSD, but there are many possible explanations of this relationship in addition to the effect of waiting time on SSD entry. We have described an approach to estimation of the impact of waiting time on SSD entry and other outcomes designed to eliminate bias from the confounding effects of unobserved individual applicant characteristics on waiting times and outcomes, as well as an approach that reduces, but does not necessarily eliminate, the confounding effects of factors pertinent to all applicants in a given state and month—most notably, the strength of the economy and the size of the VR agency's federal grant.

Our results show that VR agencies are already offering what might reasonably be called early intervention services to substantial numbers of potential SSD entrants in each year. For the 2003 cohort of new VR applicants, 50,829 entered SSD after VR application. Although this is a large number, it is modest by comparison to the total of 829,831 individuals who received SSD awards in 2003 (SSA 2004). Of course, we do not know whether VR services helped these

individuals delay or hasten SSD entry, nor do we know how services affected SSD entry for those who had not entered as of 60 months after application.

Despite the likely small size of any current impact of VR services on SSD entry relative to the number of SSD entrants, the impact on SSD and Medicare expenditures could be in the billions of dollars annually. Based on 2003 benefit amounts, a new beneficiary in 2003 who received the average benefit amount for new beneficiaries every month for 10 years would receive total benefits of about $108,000.[17] Medicare benefits, which start after 24 months, would be on the order of $65,000 per year, based on comparison of Medicare expenditures for all under-65 enrollees and total SSD benefit expenditures.[18] Combined, SSD and Medicare expenditures for the average awardee over 10 years are on the order of $173,000. If VR services in each year increase/decrease SSD entry by the equivalent of 10,000 individuals for an average period of 10 years, the size of the impact on SSD and Medicare expenditures combined would be on the order of $1.7 billion. Of course, there might be effects on expenditures for other programs (notably Medicaid and SSI), as well as tax revenues, that would increase or decrease this amount. By comparison, federal expenditures for VR services in fiscal year 2008 were $3.1 billion (Appendix C).

In the current policy environment, the potential for VR services to reduce or delay SSD entry is perhaps much more important than the extent to which VR services currently delay or accelerate SSD entry. As discussed earlier, under current policy there are incentives for VR agencies to help their applicants enter SSD; doing so may increase the chance that SSA will pay for services provided and reduce the cost of Medicaid to the state. Changes in these incentives might reduce SSD entry by VR applicants. Perhaps a more aggressive effort to have VR agencies help workers with disabilities stay in the labor force rather than enter SSD would also pay for itself through reduced SSD and Medicare expenditures, although there is no guarantee. Increases in federal funding for VR services tied to VR outreach efforts to workers who experience disability onset before they lose their jobs, perhaps via their employers (following the Alabama model), or tied to other approaches for targeting workers who might otherwise enter SSD, have the potential to pay for themselves through SSD and Medicare savings. SSA once developed a plan to conduct a test of early intervention services provided by state VR agencies as part of a broader early intervention test (Berkowitz 2002), but that plan was not pursued. Our findings suggest that such a test deserves further consideration.

[17] The mean monthly benefit for new awardees in 2003 was $897.45. The $100,000 figure is based on 10 x 12 x $897.15 = $107,658 (SSA 2004, Table 2). These amounts do not include a relatively small average benefit amount for beneficiary dependents.

[18] Livermore et al. (2011) report SSD expenditures totaling $103,762 million (exclusive of benefits for non-disabled dependents), and $62,920 million in Medicare expenditures for those under age 65 (all SSDI beneficiaries, except a very small share who are eligible because of end-stage renal disease) for fiscal year 2008. The Medicare figure is 60.64 percent of the SSD figure. We multiplied the SSD benefit expenditure estimate in the previous footnote ($107,658) by 0.6064 to obtain $65,283.

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APPENDIX A

CHARACTERISTICS OF INDIVIDUALS WHO RECEIVED AN SSD AWARD BUT WERE NOT DISABILITY INSURED AT TIME OF VR APPLICATION

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Table A.1. Demographic Characteristics of 2002 VR Applicants Who Had Received an SSD Award as of Application but Were Not Disability Insured

	Number	Percent
All Applicants	**46,348**	**100.0%**
Age		
Under 18	1	0.0%
18-25	18,770	40.5%
26-29	4,179	9.0%
30-39	8,410	18.1%
40-49	8,415	18.2%
50-59	5,243	11.3%
60-FRA	1,330	2.9%
Gender		
Male	24,305	52.4%
Female	22,043	47.6%

Sources: RSA 911 2002, MEF and TRF.

Table A.2. Socioeconomic Characteristics of 2002 VR Applicants Who Had Received an SSD Award as of Application but Were Not Disability Insured

	Number	Percent
All Applicants	**46,348**	**100.0%**
SSDI Status		
Pre-award	0	0.0%
Current pay	37,693	81.3%
STW	471	1.0%
Other S/T	8,184	17.7%
Employed at Time of VR Application		
Employed	2,724	5.9%
Not employed	41,859	90.3%
Missing	1,765	3.8%
Highest Education Level at VR Application		
8th grade or less	1,717	3.7%
9th-12th grade, no diploma	11,481	24.8%
Special-education certificate	5,472	11.8%
High school graduate or GED	16,881	36.4%
Post-secondary education	10,585	22.8%
Missing	212	0.5%

Sources: RSA 911, MEF and TRF.

Table A.3. Health and Disability Characteristics of 2002 VR Applicants Who Had Received an SSD Award as of Application but Were Not Disability Insured

	Number	Percent
All Applicants	**46,348**	**100.0%**
VR Disability Status		
No impairment	323	0.7%
Blindness	1,155	2.5%
Other visual impairment	542	1.2%
Deafness, primary communication visual	494	1.1%
Deafness, primary communication auditory	77	0.2%
Hearing loss, primary communication visual	93	0.2%
Hearing loss, primary communication auditory	183	0.4%
Other hearing impairments	21	0.0%
Deaf-blindness	22	0.0%
Communicative impairments	200	0.4%
Mobility orthopedic/neurological impairments	2,567	5.5%
Manipulation/dexterity orthopedic/neurological impairments	786	1.7%
Both mobility and manipulation/dexterity orthopedic/neurological impairments	2,106	4.5%
Other orthopedic impairments	1,897	4.1%
Respiratory impairments	352	0.8%
General physical debilitation	1,510	3.3%
Other physical impairments	3,410	7.4%
Intellectual/cognitive impairments	10,021	21.6%
Psychosocial impairments	10,494	22.6%
Other mental impairments	3,167	6.8%
Missing	6,928	14.9%
SSA Primary Disabling Condition Group		
Major affective disorders	8,420	18.2%
Other psychiatric disorders	10,337	22.3%
Intellectual/cognitive disorders	8,815	19.0%
Back disorders	2,486	5.4%
Musculoskeletal system	1,814	3.9%
Other physical disabilities	12,822	27.7%
Missing	1,654	3.6%

Sources: RSA 911, MEF and TRF.

APPENDIX B

PERCENTAGE OF THE 2002 NEW VR APPLICANT COHORT EVER AWARDED SSD AT APPLICATION, FROM APPLICATION TO CLOSURE, AND FROM CLOSURE TO 60 MONTHS AFTER APPLICATION, BY STATE OF APPLICATION

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Table B.1. Percentage of the 2002 New VR Applicant Cohort Ever Awarded SSD at Application, from Application to Closure, and from Closure to 60 Months After Application, by State of Application

State Agency	SSD at Application	From Application to Closure	From Closure to 60 Months	At Close	At 60 Months
Alabama	4%	5%	6%	8%	15%
Alaska	5%	5%	8%	10%	18%
American Samoa	14%	7%	5%	21%	26%
Arizona	10%	7%	7%	17%	23%
Arkansas	6%	5%	8%	11%	19%
California	7%	5%	6%	12%	18%
Colorado	6%	5%	8%	10%	18%
Connecticut	11%	6%	9%	17%	25%
Delaware	8%	5%	10%	13%	23%
District of Columbia	5%	4%	4%	9%	13%
Florida	6%	3%	8%	9%	17%
Georgia	5%	4%	7%	9%	16%
Guam	2%	12%	8%	14%	22%
Hawaii	6%	6%	3%	12%	15%
Idaho	5%	5%	9%	10%	19%
Illinois	8%	5%	7%	12%	19%
Indiana	6%	6%	10%	12%	21%
Iowa	5%	5%	6%	11%	16%
Kansas	7%	5%	10%	12%	22%
Kentucky	5%	6%	7%	10%	18%
Louisiana	7%	4%	6%	11%	17%
Maine	8%	11%	8%	19%	27%
Maryland	7%	5%	8%	11%	20%
Massachusetts	11%	10%	6%	21%	28%
Michigan	5%	5%	7%	10%	17%
Minnesota	8%	8%	9%	16%	25%
Mississippi	3%	4%	8%	7%	16%
Missouri	5%	4%	9%	9%	18%
Montana	4%	5%	9%	10%	19%
Nebraska	6%	4%	11%	9%	20%
Nevada	7%	4%	9%	12%	21%
New Hampshire	8%	9%	10%	17%	28%
New Jersey	7%	5%	8%	12%	20%
New Mexico	5%	5%	12%	10%	22%
New York	6%	3%	6%	9%	15%
North Carolina	4%	4%	9%	8%	17%
North Dakota	3%	5%	7%	9%	15%
Northern Marianas	2%	2%	2%	4%	6%
Ohio	6%	4%	10%	9%	19%
Oklahoma	4%	5%	6%	9%	15%

Table B.1 *(continued)*

State Agency	SSD at Application	From Application to Closure	From Closure to 60 Months	At Close	At 60 Months
Oregon	6%	3%	10%	9%	19%
Pennsylvania	6%	7%	6%	14%	20%
Puerto Rico	5%	2%	3%	7%	10%
Rhode Island	10%	7%	6%	17%	23%
South Carolina	3%	3%	6%	6%	12%
South Dakota	6%	6%	8%	12%	20%
Tennessee	6%	5%	5%	11%	16%
Texas	3%	3%	7%	6%	14%
Utah	3%	5%	5%	8%	13%
Vermont	7%	7%	10%	14%	24%
Virgin Islands	2%	2%	5%	5%	9%
Virginia	6%	6%	8%	12%	20%
Washington	7%	6%	10%	13%	23%
West Virginia	4%	4%	6%	8%	14%
Wisconsin	7%	7%	10%	14%	24%
Wyoming	4%	5%	8%	9%	17%

Sources: RSA 911 2002 and TRF.

APPENDIX C

USE OF RECESSION-INDUCED VARIATION IN EMPLOYMENT AND VR FUNDING TO ISOLATE THE IMPACT OF DELAYS IN VR SERVICE DELIVERY ON SSD ENTRY

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As discussed in Section VII, the 2007–2009 recession and its effects on VR funding might offer an opportunity to isolate the impact of delays in VR service delivery on SSD entry. This is because the recession induced rich exogenous variation in two other factors that seem likely to affect both variables—employer demand for labor and VR funding. State-level statistics on employment during this period are available from the Bureau of Labor Statistics and other sources. Here, we focus on the harder-to-find information on VR funding.

The American Recovery and Reinvestment Act (ARRA) included $540 million in grant funds for VR agencies to be spent in fiscal years 2010 and 2011, waiving the usual state match. Table C.1 shows the (fiscal year) 2008 initial allocation to each state, ARRA funding for each state, and actual allocations for 2009 through 2011, in millions. The total ARRA allocation was approximately 20 percent of the 2008 allocation, distributed equally across states. Although the funding was motivated by the severe recession, the allocation reflected the formula historically used to allocate federal funding, and did not reflect the severity of the recession or the shortfall of available funds in individual states. Hence, we would expect the correlation between changes in labor market measures and changes in funding to be modest, at most.

Despite the ARRA allocation mechanism, some states took much greater advantage of the ARRA funding than others, leading to widely disparate increases in funding in 2009 and, especially, 2010 and 2011, relative to the 2008 allocation. This disparity occurred because some states did not use all of their allocations, and in some cases because state matching funds were not available for their base grants; other states were able to obtain the unused funds. In 2010, West Virginia experienced a doubling of its grant funding relative to its 2008 allocation. Connecticut, Massachusetts, Rhode Island, and Vermont each experienced an increase of more than 50 percent relative to the 2008 allocation in at least one year, and Arkansas and Hawaii each experienced an increase of at least 25 percent in at least one year. Nine states received less than their 2008 allocation in at least one year (Georgia, Indiana, Kentucky, Louisiana, New Mexico, Ohio, Pennsylvania, South Carolina, and Wyoming). These patterns likely reflect how the severity of the recession in a particular state affected its ability to pay its share, but no doubt many other considerations played a role.

The extensive variation in the recession and increases in federal funding for VR services observed over this period should facilitate efforts to isolate the effect of exogenous changes in duration to IPE on SSD entry from the effects of other factors that might be correlated with that both. For instance, a future researcher could use VR applicant cohorts for 2007 and 2008 to estimate a linear probability model for SSD entry as of a fixed number of months after application (for example, 36), as a function of duration to IPE (using the IV for duration to IPE described earlier) and control variables for individual characteristics observed in the RSA 911 data. In addition, a researcher possibly could use multiple state-month-level variables to describe the state of the labor market over the observation period (that is, from the application month through the fixed number of months used in the specification). The large amount of variation in the economy over this period likely would support a fairly rich specification.

Table C.1. Federal VR Grants to States, Fiscal Years 2008 to 2011

State Agency	2008 Allotment	ARRA	2009 Actual	2010 Actual	2011 Actual	ARRA as % of 2008	2009 as % of 2008	2010 as % of 2008	2011 as % of 2008
Alabama	10	56	61	60	59	18%	109%	107%	106%
Alaska	2	9	10	11	12	19%	108%	118%	123%
Arizona	13	58	61	64	65	23%	106%	111%	112%
Arkansas	7	36	40	44	46	18%	110%	123%	128%
California	56	276	285	290	289	20%	103%	105%	105%
Colorado	7	36	38	40	40	20%	105%	111%	112%
Connecticut	3	20	23	31	24	17%	117%	**156%**	121%
Delaware	2	9	11	11	10	19%	117%	114%	110%
District of Columbia	2	13	13	13	15	15%	103%	106%	118%
Florida	32	153	159	159	156	21%	104%	104%	102%
Georgia	19	92	76	77	65	20%	83%	83%	70%
Hawaii	2	11	13	15	13	20%	117%	133%	117%
Idaho	3	16	16	16	15	21%	101%	100%	98%
Illinois	20	105	113	118	115	19%	108%	112%	109%
Indiana	12	67	69	63	64	19%	103%	94%	96%
Iowa	6	31	32	27	26	18%	103%	88%	84%
Kansas	5	27	28	29	29	19%	103%	108%	108%
Kentucky	9	52	53	47	46	18%	103%	91%	89%
Louisiana	10	56	33	31	33	18%	59%	56%	59%
Maine	3	15	16	17	16	17%	105%	111%	110%
Maryland	7	38	46	47	47	18%	120%	123%	124%
Massachusetts	7	46	53	67	69	16%	117%	147%	**151%**
Michigan	18	97	100	102	99	19%	103%	105%	101%
Minnesota	8	43	45	47	47	18%	104%	109%	110%
Mississippi	7	41	43	45	44	17%	105%	108%	108%
Missouri	11	62	65	63	65	18%	104%	101%	105%
Montana	2	11	12	12	12	19%	109%	112%	109%
Nebraska	3	17	19	20	20	18%	110%	114%	115%
Nevada	4	18	10	17	19	24%	57%	97%	104%
New Hampshire	2	11	12	12	12	18%	113%	109%	112%
New Jersey	9	55	59	59	58	17%	107%	108%	104%
New Mexico	4	23	24	24	22	20%	106%	106%	97%
New York	26	147	156	177	169	17%	106%	120%	115%
North Carolina	18	93	97	107	103	19%	105%	115%	112%
North Dakota	2	9	10	10	10	19%	104%	107%	107%
Ohio	22	120	121	99	106	18%	101%	82%	88%
Oklahoma	8	41	42	41	43	19%	104%	101%	107%
Oregon	7	35	44	39	39	20%	125%	111%	111%
Pennsylvania	21	121	124	129	99	17%	103%	106%	82%
Rhode Island	2	10	11	13	16	17%	106%	129%	**159%**
South Carolina	10	51	54	55	50	19%	106%	109%	98%
South Dakota	2	9	10	10	10	19%	106%	107%	107%
Tennessee	12	66	68	73	73	19%	104%	111%	111%
Texas	45	218	227	236	234	21%	104%	108%	108%
Utah	6	28	32	38	38	21%	113%	134%	135%
Vermont	2	9	10	13	15	19%	109%	140%	**157%**
Virginia	12	62	67	71	73	19%	108%	115%	118%
Washington	10	51	53	52	54	20%	104%	102%	105%
West Virginia	4	25	26	55	48	17%	102%	**216%**	**189%**
Wisconsin	10	55	57	56	57	18%	103%	101%	103%
Wyoming	2	9	9	9	9	19%	93%	94%	94%
Total	**540**	**2,761**	**2,975**	**3,085**	**3,085**	**20%**	**108%**	**112%**	**112%**

Sources: Values in first five columns are millions of dollars, not inflation adjusted. 2008 allotment is from GAO (2010). Remaining figures are from on-line tables available from the U.S. Department of Education at http://www2.ed.gov/about/overview/budget/statetables/index.html, accessed July 15, 2012. Percentages in the last four columns were calculated by the authors from the values in the first five columns.

Researchers could also use ARRA-induced changes in federal funding for VR services as an additional IV. These changes presumably had an effect on duration to IPE. It is possible that they are correlated with the strength of the state's economy, but the effect of the latter presumably will be captured by the state-month variables for the strength of the economy. That is, conditional on the variables for the state of the economy, changes in VR funding presumably affect SSD entry for VR applicants only through their effect on duration to IPE. It is also possible, however, that changes in VR funding have effects on the quantity or quality of services received beyond the effect on duration to IPE, and those effects might also affect SSD entry. Hence, a reasonable alternative to using the VR funding variable as an additional IV is to use it as an additional control variable. One weakness of any VR funding variable is that it will vary across fiscal years and states only; there will be no monthly variation within years.

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APPENDIX D

VARIABLES USED IN STUDY

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As noted in the research design of this study, the variables used come from three sources—the RSA 911, the TRF, and the MEF. They are either taken directly from the data sets or constructed from variables available in the data sets. Table D.1 provides names and descriptions of these variables.

Table D.1. Variables Used in Study

Variable	Description
SSD Program-Related Variables	
DI insured date	• This variable indicates the date an individual achieves disability-insured status. It is derived from MEF, using an algorithm provided by SSA.
Date of SSDI entitlement	• This variable is taken from the TRF. It indicates the date of SSDI entitlement.
Date of SSDI award	• This variable is taken from the TRF. It indicates the DI award date for each beneficiary.
SSDI at time of VR application	• This variable indicates SSDI status at time of VR application [SSDI = 0 (no), 1 (yes)]. It is constructed using the RSA 911 and TRF.
SSDI at or before time of VR application	• This variable indicates SSDI status at time of VR application [SSDI = 0 (no), 1 (yes)]. It is constructed using the RSA 911 and TRF.
SSDI at time of VR case closure	• This variable indicates SSDI status at time of VR closure [SSDI = 0 (no), 1 (yes)]. It is constructed using the RSA 911 and TRF.
Date of SSI entitlement	• This variable is taken from the TRF. It indicates the date of SSI entitlement.
Date of SSI award	• This variable is taken from the TRF. It indicates the SSI award date for each beneficiary.
SSI at time of VR application	• This variable indicates SSI status at time of VR application [SSI = 0 (no), 1 (yes)]. It is constructed using the RSA 911 and TRF.
SSI at time of VR closure	• This variable indicates SSI status at time of VR closure [SSI = 0 (no), 1 (yes)]. It is constructed using the RSA 911 and TRF.
Months from VR application to SSDI entitlement	• This variable is constructed using the RSA 911 and the TRF to indicate the number of months between month of VR application and month of SSDI entitlement or award.
DAC at time of VR Application	• This variable indicates disabled adult child beneficiary status in December 2009 or as of the beneficiary's last month on the rolls if earlier.
DWB at time of VR application	• This variable indicates disabled widow(er) beneficiary status in December 2009 or as of the beneficiary's last month on the rolls if earlier.

Table D.1 *(continued)*

Variable	Description
VR Program-Related Variables	
State VR agency	• State VR agency to which a client applies for services. Prior to 2002, the RSA agency variable was a 2-position field; starting in 2002, it was changed to a 3-position field for general VR agencies and blind services. We created a common designation and assigned a value label for each state (e.g., Alabama = 1, Alaska = 2, etc.).
VR application date	• As noted in the research design, our annual cohorts consist of first-time VR applicants. An individual may have multiple VR application dates, however. This variable is taken from the RSA 911 and used to indicate the client's first VR application date, if there is no record of a previous case closure.
Previous VR closure	• This variable is used to exclude clients with multiple VR applications from inclusion in more than one cohort.
VR eligibility	• This variable indicates date of VR eligibility.
Number of months from VR application to IPE	• This variable is constructed using the RSA 911 to indicate the number of months between a client's VR application and signed IPE.
VR closure date	• This variable establishes the client's first VR case closure date.
Sociodemographic Variables	
Age	• Age in years at time of VR application is based on RSA date of birth data, validated with the NUMIDENT. Dates of births that do not match are excluded from the analysis.
Gender	• Gender is determined by RSA data validated with the NUMIDENT.
Race or ethnicity	• This variable describes racial or ethnic categories. – American Indian or Alaska Native – Asian – Black – Hispanic – Native Hawaiian or Pacific Island American – White – Multiple Race/Ethnicity
Highest education level at VR application	• This variable is taken from the RSA 911. Education levels reported include the following: – No formal education – 8th grade or less – Grades 9–12, no diploma – Special education certificate – High school graduate or GED – Postsecondary education, no degree – Associate's degree or vocational/technical certification – Bachelor's degree – Master's degree or higher

Table D.1 *(continued)*

Variable	Description
Highest education level at closure	• This variable is taken from the RSA 911. Education levels reported include the following: – No formal education – 8th grade or less – Grades 9–12, no diploma – Special education certificate – High school graduate or GED – Postsecondary education, no degree – Associate's degree or vocational/technical certification – Bachelor's degree – Master's degree or higher
Employment status at VR application	• Employed at time of VR application is defined as employment with or without supports, unpaid family worker, homemaker, or self-employment.
Disability and Impairment Status Variables	
VR Primary disability area of impairment	• This variable, taken from the RSA 911, indicates primary disability area of impairment. There are 19 categories for area of impairment: 1. Blindness 2. Other Visual Impairment 3. Deafness, Primary Communication Visual 4. Deafness, Primary Communication Auditory 5. Hearing Loss, Primary Communication Visual 6. Hearing Loss, Primary Communication Auditory 7. Other Hearing Impairments 8. Deaf-Blindness 9. Communicative Impairments 10. Mobility Orthopedic/Neurological Impairments 11. Manipulation/Dexterity Orthopedic/Neurological Impairments 12. Both Mobility and Manipulation/Dexterity Orthopedic/Neurological Impairments 13. Other Orthopedic Impairments 14. Respiratory Impairments 15. General Physical Debilitation 16. Other Physical Impairments 17. Cognitive Impairments 18. Psychosocial Impairments 19. Other Mental Impairments
SSA Primary Disabling Condition Group	• This variable is constructed from the TRF. It indicates seven categories for disability group. 1. Major Affective Disorders 2. Other Psychiatric Disorders 3. Intellectual Disability 4. Back Disorders 5. Musculoskeletal System 6. Other Physical Disabilities 7. Missing

Table D.1 *(continued)*

Variable	Description
Sources of Support Variables	
TANF at time of VR application	• This variable indicates TANF status at time of VR application [TANF = 0 (no), 1 (yes)].
TANF at time of VR closure	• This variable indicates TANF status at time of VR closure [TANF = 0 (no), 1 (yes)].
General assistance (GA) at time of VR application	• This variable indicates GA (state or local government) status at time of VR application [GA = 0 (no), 1 (yes)].
General assistance at time of VR closure	• This variable indicates GA (state or local government) status at time of VR closure [GA = 0 (no), 1 (yes)].
Veterans' disability benefits at time of VR application	• This variable indicates Veterans Administration benefits status at time of VR application [VA = 0 (no), 1 (yes)].
Veterans' disability benefits at VR closure	• VA benefits status at time of VR closure [VA = 0 (no), 1 (yes)].
Workers' compensation at time of VR application	• This variable is used for the 2002 cohort. It indicates workers' compensation support at time of VR application [WC = 0 (no), 1 (yes)].
Workers' compensation at time of VR closure	• This variable is used for the 2002 cohort. It indicates workers' compensation support at time of VR case closure [WC = 0 (no), 1 (yes)].
Other public support at time of VR application	• This variable is used for the 2002 cohort. It indicates other supports at time of VR application [Other = 0 (no), 1 (yes)].
Other public support at time of VR case closure	• This variable is used for the 2002 cohort. It indicates other supports at time of VR closure [Other = 0 (no), 1 (yes)].