

Employment outcomes for individuals with spinal cord injuries: 2011–2013

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Abstract.

BACKGROUND: Employment for individuals with spinal cord injury (SCI) varies by demographic, educational, and preinjury occupational characteristics. Individuals with SCI also face a number of physical and structural barriers to returning to work postinjury. Vocational Rehabilitation (VR) services through the use of the federal and state vocational rehabilitation programs is one option for obtaining the needed supports that lead to successful competitive employment outcomes.

OBJECTIVE: This information is for those individuals with SCI whose cases were closed by VR in one of the four case closure codes: Status 08, Status 28, Status 30, or Status 26. The intent of this research is to profile participation, services received, and outcomes achieved by individuals with SCI who were participants in State Vocational Rehabilitation programs.

METHODS: Using the Federal Rehabilitation Services Administration's (RSA) 911-database, individuals with a primary physical disability of spinal cord injury who had their cases closed in Federal Fiscal Years 2011–2013 ($n = 9,205$) were selected to understand general demographic, education, SSI/SDI, and reasons for case closure information. More detailed analyses of data of services received, employment outcomes, and costs for individuals for whom an Individual Plan for Employment (IPE) also were completed.

RESULTS: Nationally, state VR agencies reported closing 3,217 cases in FY 2011, 3,098 cases in FY 2012, and 2,890 cases in FY 2013 in the four case closure codes: Status 08, Status 28, Status 30, and Status 26. Status 26 closure represents those cases closed successfully. In this study, 991 individuals with SCI were closed in Status 26 during FY 2011, 972 in FY 2012, and 936 in FY 2013. The majority of cases closed successfully were for individuals who were white/Caucasian, and rates were slightly higher for individuals with an associate's degree or more.

CONCLUSIONS: The findings in this study are consistent with previous findings on the demographic characteristics of individuals with SCI and return to work. More research is needed on the relationship between certain demographic characteristics and successful employment postinjury, the impact of rehabilitation technology services on successful case closures, the types of jobs that individuals with SCI obtain, and what makes state VR programs in some areas more successful than others.

Keywords: Spinal cord injury, SCI, employment, return to work, Vocational Rehabilitation, Rehabilitation Services Administration

1. Introduction

The prevalence of people living with a spinal cord injury (SCI) in the United States has been estimated to be 270,000 individuals (Spinal Cord Injury Facts and

Figures at a Glance, 2012). The reported employment rate of people with SCI varies widely due to differences in the definition of employment and point in time post injury that is used to measure the outcome (Ottomanelli & Lind, 2009). One source for the employment rate of individuals with SCI is the National Spinal Cord Injury Database (NSCID). Since 1973, NSCID has collected information from the federally funded SCI Model Systems. As of 2011, the database contained information

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on 28,450 individuals with SCI. More than half of these individuals (57.1%) were employed at the time of their injury. One year post injury, 11.7% were employed; however, by 20 years post injury, 35.2% were employed (Spinal Cord Injury Facts and Figures at a Glance, 2012).

A multitude of factors must be considered when understanding employment for individuals with spinal cord injury. In a recent work by Krause and his colleagues focusing on employment after the onset of spinal cord injury, participants included adults with a traumatic SCI of at least one year duration and under 65 years of age at the time of injury (Krause, Terza, Erten, & Focht, 2012). Almost 52% of the participants worked at some point in time postinjury. Demographic variables such as race and gender seemed to have an effect on employment after SCI as nonwhites and women were found to have spent less time working postinjury (Krause et al., 2012). These findings are consistent with previous literature on race and gender and return to work for individuals with SCI (Ottomanelli & Lind, 2009; Phillips, Hunsaker, & Florence, 2012; Yasuda, Wehman, Targett, Cifu, & West, 2002). Previous studies have found that minorities with SCI are disadvantaged in returning to work postinjury, which likely mirrors employment patterns found among the general population (Ottomanelli & Lind, 2009). An earlier study by Krause found racial differences even when controlling for education (Krause, Sternberg, Maides, & Lottes, 1998).

Educational attainment has been found to be perhaps the strongest predictor of return to work for individuals with SCI, as individuals with college level backgrounds are most likely to return to work (Blackwell, Leierer, Haupt, & Kampotsis, 2003; Hess, Ripley, McKinley, & Tewksbury, 2000; Marini, Lee, Chan, Chapin, & Romero, 2008; Ottomanelli & Lind, 2009; Tomassen, Post, & van Asbeck, 2000; Yasuda et al., 2002). Possibly even more important than education attainment prior to the injury is the further education or retraining after the onset of SCI. Krause et al. (2012) found that postinjury educational milestones were important to postinjury employment. Obtaining more education, vocational training, or retraining after SCI has been associated with a greater likelihood of employment and availability. In addition, having a 4-year degree or graduate degree prior to injury was associated with a greater time worked after SCI (Krause et al., 2012).

Phillips, Hunsaker, and Florence (2012) analyzed longitudinal data on secondary outcomes from individuals with SCI in a large southeastern rehabilitation

hospital in the United States. The study began collecting data from newly injured individuals participating in an educational intervention post discharge ($n = 111$), who were then followed for up to 2 years. The focus was on the time and ability to return to productive activities, defined as vocational training or informal work, and employment (Phillips et al., 2012). Results indicated that increased age and Medicaid assistance significantly decreased the likelihood of return to productive activities, while being white and having a higher median income significantly increased the return to productive activities. Age, race, and income also affected the return to employment in the same ways (Phillips et al., 2012). Being in the 75th income percentile compared with the 25th percentile shortened return time to employment by nearly 7 months (Phillips et al., 2012). These findings suggest that age, income, race, and insurance all play important roles in post-injury productivity and employment.

In addition to the importance of demographic factors in labor force participation, employment characteristics play a significant role in both entering and maintaining employment after SCI (Krause, Terza, & Dismuke, 2010). Using survey data mentioned in their 2012 study, Krause et al. found that there are distinct advantages in having worked in managerial or professional and sales or office occupations prior to injury (2010). Employment in one of these areas was significantly associated with a greater probability of employment after SCI. Managerial and sales positions post-injury were also associated with higher job stability (Krause et al., 2010). The type of work after SCI can be influenced by the severity of the injury, as physical constraints on the body may limit the employment opportunities available (Anderson, Dumont, Azzaria, Le Bourdais, & Noreau, 2007). Some studies have found that individuals who had greater physical abilities were more likely to be employed (Ottomanelli & Lind, 2009). In addition, this can be further linked to education as highly educated individuals with SCI have a wider access to less physically demanding employment positions (Krause, 1992; Marini et al., 2008).

Vocational Rehabilitation (VR) through the use of the federal and state vocational rehabilitation programs is one option for obtaining the needed supports that lead to successful competitive employment outcomes. VR services work to reduce barriers and return individuals with SCI to work (Ottomanelli & Lind, 2009). Annually, each Vocational Rehabilitation Agency funded by the Rehabilitation Act of 1973, as amended, submits to the Federal Rehabilitation Services Administration

(RSA) a report, The RSA 911 Closure Report¹. Each 911 Report contains information on individuals who terminated VR services during an identified Fiscal Year. Termination of VR Services is reported as one of four Case Closure codes by a VR agency to include the following:

- Status 08: An individual was found to be not eligible for services
- Status 28: Unsuccessful, case closed after implementing an Individualized Plan for Employment (IPE)
- Status 30: Unsuccessful, case closed after eligibility determination but before implementing an IPE
- Status 26: Successful rehabilitation.

The purpose of the present paper is to analyze data reported from the RSA 911 Closure Reports for Federal Fiscal Years 2011, 2012, and 2013 for individuals whose primary disability is spinal cord injury. The information is for those individuals with SCI whose cases were closed by VR in one of the four case closure codes: Status 08, Status 28, Status 30, or Status 26. The intent of this research is to profile participation, services received, and outcomes achieved by individuals with SCI who were participants in State Vocational Rehabilitation programs.

2. Methods

2.1. Source of data

The data for the present study originated from the Federal Rehabilitation Services Administration's (RSA) 911-database. The RSA 911-database contains detailed information regarding demographic and other data for each individual whose case is closed by a Vocational Rehabilitation Agency throughout the United States and its territories. There are 215 data items captured by the RSA-911 including but not limited to type of disabilities, services provided through the VR program, providers and costs of services provided, and employment outcomes achieved at time of case closure. Data are entered into the 911-database by certified rehabilitation counselors and are checked by two computer programs for potential errors.

¹Detail on the RSA 911 Closure Report format for the Fiscal Years covered by this Research Brief can be viewed at <http://www2.ed.gov/policy/speced/guid/rsa/pd/2012/pd-12-05.pdf>

2.2. Accessing data for the study

Information contained in the RSA 911-database is within the public domain. A request was made to RSA for the data included in this study, which was provided in SPSS format. All personal identifiers such as dates of birth and Social Security Numbers were removed prior to providing the data to the researchers. The data elements selected for this study were copied from the SPSS format into Excel spread sheets for analysis. As noted earlier, the RSA 911-database includes approximately 215 data elements. The present study focused attention primarily on general demographic, education, and SSI/SDI, and reasons for case closure information for all applicants with a primary disability of SCI closed by VR during the report period. A more detailed analysis of data of services received, employment outcomes, and costs for individuals for whom an Individual Plan for Employment (IPE) was initiated and completed.

2.3. Selection of participants

Data utilized for the present study included individuals who had their cases closed in Federal Fiscal Years 2011, 2012, and 2013 with a primary physical disability of spinal cord injury. From 2011 to 2013, 1,758,487 applicants had their cases officially closed by VR. To be included in this study, applicants must: (a) have had spinal cord injury as their primary disability, (b) have been age 25 to 64 years at the time they applied for services, and (c) have applied for services from a general or combined VR agency located throughout the United States and its territories. Over the three-year period investigated, 9,205 participants met this criterion:

Demographic data categories	FY 2011	FY 2012	FY 2013
Number of applicants closed in FY	<i>n</i> = 3,217	<i>n</i> = 3,098	<i>n</i> = 2,890
Male	68.5%	69.0%	69.2%
Female	31.5%	31.0%	30.8%
White/Caucasian	75.8%	73.8%	76.2%
African American	21.9%	23.6%	22.0%
Native American	1.9%	2.3%	2.0%
Asian	0.9%	1.2%	1.4%
Pacific Islander	0.6%	0.6%	0.5%
Hispanic or Latino	8.0%	8.2%	10.4%
Percent with secondary disabilities	39.6%	39.5%	41.1%
Mean age at application	42.5	43.5	42.6
Standard deviation: Age at application	9.8%	9.9%	10.0%

3,217 in 2011, 3,098 in 2012, and 2,890 in 2013. Their demographics may be found in Table 1. The age range of 25–64 at time of application was chosen for this study, because a separate study is being done by the authors on youth in transition, age range 18–24 at time of application for VR serves with a primary physical disability to include spinal cord injury.

3. Results

3.1. Demographic information on all VR participants with SCI for FY 2011, 2012, 2013

Vocational Rehabilitation Agencies closed a total of 9,205 cases for individuals with SCI during the three-year period covered by federal FYs 2011, 2012, and 2013. The demographic characteristics of these individuals at time of application for VR services are presented in Table 1. From 2011 to 2013, there was a decrease each year in the number of cases closed by VR for individuals with SCI. The 2,890 applicants closed in FY 2013 represent approximately a 10% reduction from the 3,217 applicants closed in FY 2011.

The number of cases VR closed for males versus females remained fairly consistent across the three years. In each year, almost 70% of the cases closed were male. The age range of the individuals was 25 to 64, at the time of application with a mean age of 43 for FY 2011, 2012, and 2013. The majority of the individuals whose cases were closed during this time period were white/Caucasian with approximately 75% of the sample each year. This was followed by individuals who were African American: 21.9% in FY 2011, 23.6% in FY 2012, and 22% in FY 2013. Very few cases were closed for individuals reported as Native American, Asian, or Pacific Islander during this time period. Ten percent or less of the sample for each of the three years was identified as Hispanic or Latino. Specific demographic information is presented in Table 1.

3.2. Education at application

Information on the educational levels for individuals with SCI at the time of application whose cases were closed during FY 2011, 2012, and 2013 can be found in Table 2. Individuals with SCI having a Bachelor's degree, Master's degree, or higher accounted for 16.9% of the sample in FY 2011, 17.7% in FY 2012, and 17.5% in FY 2013. If all individuals who had an Associate's degree (two year degree) or higher are combined into

Table 2
Level of education at application

Education level completed	FY 2011	FY 2012	FY 2013
No formal schooling	0.3%	0.1%	0.1%
Grades 1–8	1.7%	2.0%	1.6%
Grades 9–12	11.0%	9.6%	9.7%
SPED certificate	0.7%	0.6%	0.5%
HS graduate	37.3%	36.0%	33.5%
Post-secondary, no degree	19.2%	19.6%	22.1%
Associate's degree	13.1%	14.2%	15.0%
Bachelor's degree	11.7%	12.6%	12.2%
Master's degree or higher	5.2%	5.1%	5.3%

one category, 30% of the sample in FY 2011; 31.9% of the sample in FY 2012; and 32.5% of the sample in FY 2013 had achieved a degree past high school at the time of application. The educational level achieved by the largest number of individuals in this sample for any one category was high school: 37.3% in FY 2011, 36% in FY 2012, and 33.5% in FY 2013.

3.3. Receipt of Supplemental Security Income (SSI) and Social Security Disability Income (SSDI) at application

Tables 3 and 4 present information on receipt of Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) for individuals with SCI whose cases were closed during the study period. Table 3 presents information on individuals with SCI at application for all cases closed in Status 08, 28, 30, and 26 during this time period. The percentage of individuals who were receiving SSI at time of application was

Table 3
SSI and SSDI receipt status at application for all case closure codes

SSI/SSDI	FY 2011 (n = 3,217)	FY 2012 (n = 3,098)	FY 2013 (n = 2,890)
SSI receipt at application	16.2%	18.1%	18.9%
SSDI receipt at application	38.7%	39.4%	41.2%

Table 4
SSI and SSDI receipt status at application and closure for individuals with SCI whose cases were closed in status 26 (employment)

	FY 2011 (n = 991)	FY 2012 (n = 972)	FY 2013 (n = 936)
<i>SSI receipt status</i>			
SSI receipt at application	9.1%	10.4%	12.7%
SSI receipt at closure	7.4%	9.8%	10.7%
<i>SSDI receipt status</i>			
SSDI receipt at application	37.0%	38.6%	39.4%
SSDI receipt at closure	41.2%	42.7%	41.3%

less than 20% for each of the three years, with a slight increase noted from FY 2011 to FY 2013. Individuals receiving SSDI at application showed a slight increase in percentage of people receiving SSDI at application for all case closure codes for FY 2011, 2012, and 2013. However, it should be noted that the number of individuals whose cases were closed in 2013 represents approximately a 10% decrease from 2011.

Table 4 presents information on SSI and SSDI recipients at application and at case closure for Status 26, closed in employment. The percentage of SSI recipients at application increased slightly from 9.1% in FY 2011 to 10.4% in 2012, and to 12.7% in FY 2013. SSI receipt decreased from point of application to point of closure for individuals closed in employment from 9.1% to 7.4% in FY 2011, from 10.4% to 9.8% in FY 2012, and from 12.7% to 10.7% in FY 2013. Information is not available for this report on reductions in SSI payment amounts from point of application to point of termination in employment.

The percentage of individuals with SCI receiving SSDI at application shows a slight increase from 37% in FY 2011, to 38.6% in FY 2012, to 39.4% in FY 2013. This is an increase of 2.4% at the time of application for individuals with SCI from 2011 to 2013. When comparing receipt of SSDI at application to receipt at closure in employment, there is an increase across all three years with more individuals with SCI receiving SSDI at closure than at application. In FY 2011, the increase was from 37.0% to 41.2%; in FY 2012, from 38.6% to 42.7%; and in FY 2013, from 39.4% to 41.3%.

3.4. *VR applicants who signed an individualized plan for employment*

Table 5 presents the number and percent of VR applicants with SCI who signed an Individualized Plan for Employment (IPE) prior to case closure in Status 28 and Status 26. Approximately two-thirds of the applicants signed an IPE across the three Fiscal Years. Although the number cases closed in FY 2013 decreased from FY 2011, the percentage of individuals with a SCI who had a signed IPE at case closure increased from 63% to almost 67%.

3.5. *Status of participants at point of case closure by VR*

Table 6 presents information on participants with SCI whose cases were closed by VR during the study time period. A very small percentage of the individuals with

Table 5
Number and percent of VR applicants who signed an IPE

Individuals with a signed IPE prior to case closure	FY 2011	FY 2012	FY 2013
Total number of case closures for the fiscal year	3,217	3,098	2,890
Number of applicants closed with an IPE	2,027	1,959	1,929
Percent of applicants closed with an IPE	63.0%	63.2%	66.7%

Table 6
Summary of exit categories of VR case closures

Reasons for case closure	FY 2011	FY 2012	FY 2013
Number of individuals closed by VR (All Closure Categories)	3,217	3,098	2,890
Exited as an applicant	7.4%	7.2%	5.4%
Exited during or after a trial work experience	1.2%	1.1%	0.6%
Exited from an order of selection waiting list	0.5%	1.3%	1.6%
Exited without an employment outcome, after eligibility, but before an IPE was signed	27.9%	27.2%	25.7%
Exited without an employment outcome, after a signed IPE but before receiving services	2.6%	1.8%	2.1%
Exited without an employment outcome, after signing an IPE and receiving services (Status 28)	29.6%	30.0%	32.2%
Successfully exited with an employment outcome (Status 26)	30.8%	31.4%	32.4%
Successfully exited Status 26 in supported employment	3.6%	2.1%	2.6%

SCI who applied for services exited as an applicant, exited during or after a trial work experience, or exited from an order of selection waiting list. In addition, the percentage for individuals who had a signed IPE but exited before receiving services was very small.

VR case closures for individuals who had been found eligible for services but did not sign an IPE decreased slightly from FY 2011 to FY 2013. Approximately 28% of the individuals whose cases were closed in 2011 exited after eligibility without a signed IPE as compared to approximately 26% in FY 2013; or, approximately one in every four VR applicant terminated after being found eligible but before an IPE was signed.

The majority of participants with SCI whose cases were closed in FY 2011, 2012, and 2013 were closed after a signed IPE was implemented. This includes individuals who exited without an employment outcome, Status 28; and those who exited with an employment outcome, Status 26. In FY 2011, 991 (30.8%) of the

3,217 VR case closures were for individuals whose cases were closed in Status 26. In FY 2012, 972 (31.4%) of the 3,098 case closures were closed in Status 26. In 2013, 936 (32.4%) of the 2,890 case closures in FY 2013 were closed in Status 26. These individuals were considered a successful rehabilitation by VR agencies. For all three years, approximately 3 out of 10 individuals with a primary disability of SCI exited the VR system with an employment outcome consistent with their IPE. Conversely, approximately 7 out of 10 individuals with SCI exited the VR system without an employment outcome.

Table 7 presents the information on the Rehabilitation Rate for individuals with SCI for the study time period. The Rehabilitation Services Administration calculates a “Rehabilitation Rate” to measure outcome performance for VR Agencies. The Rehabilitation Rate is calculated by dividing the total number of Status 26 Closures (individuals closed with an employment outcome) by the sum total of the Status 26 and Status 28 closures (individuals closed without an employment

outcome after signing an IPE). The Rehabilitation Rate for individuals with a primary disability of spinal cord injury in FY 2011 was 51.0%; in FY 2013, it was 51.2%; and in FY 2013 the Rehabilitation Rate was 50.2%.

3.6. Reasons for VR case closure: All applicants

Table 8 presents information on the reasons that cases were closed for individuals with SCI who were terminated from VR services during FY 2011, 2012, or 2013. Percentages of closures remained fairly consistent over the three Fiscal Years. The most frequent reasons for closure included 1) employment outcome achieved, 2) refused services, 3) unable to locate, or the 4) failure to cooperate. A very small percentage of cases were closed as being too disabled to benefit from services or less than 3% for each year.

3.7. Reasons for case closure: Individuals found eligible for services but exited BEFORE IEPs were signed

Table 9 provides information on the reasons for these case closures for individuals with SCI who were found eligible for services but exited before their IPEs were signed. Approximately 28% of all case closures in 2011 were individuals who exited after eligibility without a signed IPE as compared to approximately 26% in FY 2013. The most frequent reasons for closure were 1) refused services, 2) unable to locate, and 3) failure to cooperate. A very small percentage of cases were closed with the reason as too disabled or 3% or less for this time period. All percentages remained fairly consistent across the three Fiscal Years.

Table 7

Status at case closure for participants who had an IPE implemented	FY 2011	FY 2012	FY 2013
Status at case closure for individuals with SCI			
Exited without an employment outcome, after signing an IPE and receiving services (Status 28)	n=952	n=929	n=931
Successfully exited with an employment outcome (Status 26)	n=991	n=972	n=936
Rehabilitation rate (Status 26 divided by the sum of Status 26+28)	51%	51.2%	50.2%

Table 8
Reasons for VR Case Closure: All Applicants

Reasons for VR case closure	FY 2011 (n=3,217)	FY 2012 (n=3,098)	FY 2013 (n=2,890)
Employment outcome achieved	30.8%	31.4%	32.4%
Refused services	20.2%	18.6%	19.3%
Unable to locate	17.5%	18.3%	18.0%
Failure to cooperate	12.9%	13.3%	11.9%
Too disabled	2.4%	2.0%	2.6%
Death	1.6%	1.4%	1.6%
Institutionalized	0.4%	0.4%	0.3%
Transferred to another agency	0.6%	1.0%	0.9%
No disabling condition	0.4%	0.2%	0.2%
No impediment to employment	0.5%	0.5%	0.3%
Transportation not available	0.3%	0.3%	0.2%
Does not require VR services	0.4%	0.4%	0.2%
Extended services not available	0.1%	0%	0%
All other reasons	11.7%	12.3%	12.0%
Sheltered employment	0%	0%	0%

Table 9

Reasons for case closure: Individuals who exited without an employment outcome, after eligibility, but before an IPE was signed

Reasons for VR case closure	FY 2011 (n=898)	FY 2012 (n=843)	FY 2013 (n=743)
Number individuals who exited after eligibility without a signed IPE			
Refused services	28.3%	27.7%	29.5%
Unable to locate	25.7%	26.1%	26.0%
Failure to cooperate	22.2%	21.9%	19.9%
Too disabled	3.0%	2.0%	2.8%
Transferred to another agency	1.0%	1.4%	0.8%
Death	0.2%	1.0%	0.4%
Institutionalized	0.6%	0.4%	0.7%
Transportation not available	0.4%	0.7%	0.4%
All other reasons	18.4%	18.9%	19.4%

3.8. Demographic information on VR participants with SCI closed in employment (Status 26)

The demographic characteristics of individuals with SCI whose cases were closed in Status 26 during FY 2011, 2012, and 2013 are presented in Table 10. Approximately 70% of the participants who successfully achieved an employment outcome during this time period were male. This finding is fairly consistent with the information presented in Table 1 with the percentage of males whose cases were closed during these years exceeding females. The majority of the individuals whose cases were closed in Status 26 during this time period were white/Caucasian. This was followed by individuals who were African American with 17% be the highest percentage during FY 2012 and 15% being the lowest in FY 2011. Very few cases were closed successfully in Status 26 for individuals reported as Native American, Asian, or Pacific Islander during this time period. Eleven percent or less of the sample for each of the three years was identified as Hispanic or Latino. Specific demographic information is presented in Table 10.

3.9. Comparison of services for participants closed in Status 26 or 28

Table 11 presents the primary services received through VR for participants whose cases were closed in Status 26 during FY 2011, 2012, or 2013. Table 12 presents the services received by participants closed unsuccessfully in Status 28 for this same time period. Assessment, VR counseling and guidance, and rehabilitation technology were the three most frequent services received for individuals whose cases were closed successfully. Assessment, VR counseling and guidance, and diagnosis and treatment were the three most frequent services received for individuals whose

Table 10
Demographic information for VR participants with SCI closed in Status 26

Demographic data categories	FY 2011 (n = 991)	FY 2012 (n = 972)	FY 2013 (n = 936)
Male	66.1%	70.4%	69.9%
Female	33.9%	29.6%	30.1%
White/Caucasian	83.7%	80.3%	81.8%
African American	14.5%	17.2%	16.3%
Native American	1.4%	1.6%	1.4%
Asian	1.0%	1.6%	1.1%
Pacific Islander	0.5%	0.8%	0.5%
Hispanic or Latino	6.9%	6.8%	11.3%

Table 11
Services received by participants closed successfully in Status 26

VR services received	Status 26		
	FY 2011 (n = 991)	FY 2012 (n = 972)	FY 2013 (n = 936)
Assessment	66.8%	65%	65.2%
VR counseling and guidance	66.3%	67.9%	65%
Rehabilitation technology	47.8%	47.5%	48.8%
Diagnosis and treatment	40.8%	40%	37.8%
Other services	34.5%	34%	34%
Transportation	31.6%	35%	31.8%
Job placement assistance	29.5%	31.2%	31.2%
Information and referral	23.7%	20.6%	19.7%
Job search assistance	18.6%	20%	18.8%
College or university training	14.4%	15.8%	14.1%
Maintenance	14.2%	14.6%	16.1%
On-the-job supports	13.9%	13.6%	14.5%
Occupational/vocational training	10.4%	10.2%	12.1%
Misc. training	10.1%	13.1%	12.6%
On-the-job training	3.2%	2.8%	2.6%
Job readiness training	7.8%	7.7%	7%
Technical assistance	4.1%	3.8%	4.2%
Disability related augmentative training	2.2%	3.2%	2.1%
Personal attendant	1.6%	1.2%	2.6%
Interpreter	1.6%	0.4%	0.5%
Basic academic remedial training	0.6%	0.4%	0.7%
Reader	0.1%	0%	0.9%

cases were closed unsuccessfully during the same time period.

A larger percentage of individuals whose cases were closed in Status 26 received rehabilitation technology services than those whose cases were closed unsuccessfully. The Rehabilitation technology service category includes rehabilitation engineering, assistive technology devices, and assistive technology services. In FY 2011, 47.8% of the individuals closed in Status 26 received this service as compared to 22.9% whose cases were closed in Status 28. This finding remained consistent across the time period with 47.5% of successful cases receiving rehabilitation technology services in 2012 versus 22% who were unsuccessful. In 2012, 48.8% of those cases closed successfully received rehabilitation technology services as compared to 24.3% whose cases were closed unsuccessfully. In other words, almost 50% of all successful case closures received rehabilitation technology services during FY 2011, 2012, and 2013.

The percentage of individuals who received job placement assistance was slightly higher for those whose cases were closed successfully. This was approximately 30% across all three years for individuals closed in Status 26 versus less than 25% for individuals closed in Status 28. The difference in job search assistance

Table 12

Services received by participants closed unsuccessfully in Status 28

VR services received	Year		
	FY 2011 (n = 952)	FY 2012 (n = 929)	FY 2013 (n = 931)
Assessment	58.9%	63.9%	57.5%
VR counseling and guidance	57.8%	63.5%	59.5%
Diagnosis and treatment	39.7%	40.6%	43.5%
Transportation	32.2%	32%	36.4%
Other services	27.9%	30.6%	30.3%
Job placement assistance	24.7%	21.6%	21.7%
Rehabilitation technology	22.9%	22%	24.3%
College or university training	21.1%	21.3%	24.1%
Information and referral	16.2%	16.5%	18.7%
Job search assistance	15.5%	18%	19.1%
Maintenance	12.8%	14%	14.3%
Misc. training	11.9%	9%	9.8%
Occupational/vocational training	10.8%	13.5%	12.6%
Job readiness training	7.8%	8.9%	8.3%
On-the-job supports	7%	8.2%	6.9%
Technical assistance	2.8%	1.9%	1.9%
On-the-job training	2.1%	1.4%	1.7%
Personal attendant	1.6%	1.3%	2.5%
Disability related augmentative training	1.5%	1.5%	1.2%
Basic academic remedial training	0.8%	0.9%	1.2%
Interpreter	0.2%	0.4%	0.8%
Reader	0.1%	0.2%	1.2%

services received by two groups is also small. In 2011, approximately 19% of the cases closed successfully received job search assistance versus 16% of the cases closed unsuccessfully. In 2013, the percentage of cases closed in Status 26 receiving job placement services remained at approximately 19% while the percentage of those cases closed in Status 28 increased slightly to 19%. For both Status 26 and 28, the percentages are low for individuals who received these services from vocational rehabilitation.

The percentages of participants who received college or university training as a service were less than 25% for both Status 26 and 28 during this time period. Individuals whose cases were closed in Status 28 or unsuccessful received this as a service at a higher percentage than those whose cases were closed successfully. For instance, in FY 2011, 14.4% of the individuals whose cases were closed in Status 26 received this service as opposed to a slightly higher percentage of 21.1% for individuals whose cases were closed unsuccessfully. In 2013, the percentage of cases closed successfully receiving college or university training as a service was 14.1% as opposed to a slight increase to 24.1% for those individuals whose cases were closed unsuccessfully.

Differences in percentages for other services vary slightly between the two groups. For instance, trans-

portation as a service was in the top five services received for both groups. In FY 2011, 31.6% of the individuals whose cases were closed in Status 26 received this service as opposed to a slightly higher percentage of 32.2% for individuals whose cases were closed unsuccessfully. In 2013, the percentage of cases closed successfully receiving transportation as a service remained fairly consistent at 31.8% as opposed to a slight increase to 36.4% for those individuals whose cases were closed unsuccessfully. Please refer to Tables 11 and 12 for services received by participants closed in Status 26 and 28.

3.10. Educational level for Status 26 closures at application and closure

For those individuals whose cases were closed successfully in Status 26, less than 16% of these closures for all three years received college or university training as a VR funded service. Of the 991 participants who were closed successfully in 2011, 14.4% received this service. In 2012, 15.8% of the 972 Status 26 closures received this service. Finally in 2013, 14.1% of the 936 Status 26 closures received college or university training as a service. This information is provided in Table 11.

3.11. Employment outcomes for individuals closed in Status 26

Table 13 presents information on hours worked per week and weekly earnings for individuals with SCI who terminated VR services in employment. The average number of hours worked per week by individuals with SCI was approximately 29 hours, which was consistent across the three year time period. Weekly earnings averaged \$468.56 in FY 2011, \$499.59 in FY 2012, and \$481.09 in FY 2013. Table 14 shows the percentage of participants closed who worked full time versus part time with part time employment defined as less than 35 hours per week. Slightly more than half of the participants worked less than 35 hours per week with the

Table 13

Earnings and hours of employment outcomes for individuals closed successfully in Status 26

Employment Outcome	FY 2011 (n = 991)	FY 2012 (n = 972)	FY 2013 (n = 936)
Hours worked per week	29.1	29.4	29.3
Weekly earnings	\$468.56	\$499.59	\$481.09

Table 14
Full versus part-time employment outcomes

Hours worked at closure	FY 2011 (n=991)	FY 2012 (n=972)	FY 2013 (n=936)
<35 hours per week	51.8%	52.4%	52.2%
>35 hours per week	48.2%	47.6%	47.8%

remaining working full time or more than 35 hours per week.

3.12. Cost of services for VR participants

Table 15 presents the total VR expenditures for services provided to all individuals with SCI as well as the expenditures for individuals closed in Status 26 and 28. Total expenditures for all terminations increased from approximately \$20.1 million FY 2011 to \$23.87 million in FY 2013. The number of individuals whose cases were closed during this time period decreased as the total expenditures increased.

Total expenditures for terminations in employment, Status 26, increased from approximately \$13.29 million FY 2011 to \$16.12 million in FY 2013. Approximately two thirds of the total VR expenditures for all individuals with SCI during this time period were spent on individuals closed successfully in employment. Specifically, the percentage of total expenditures for Status 26 closures was 66.1% in FY 2011, 68.3% in FY 2012, and 67.5% in FY 2013. The average VR

expenditure per participant with SCI who was closed *successfully* in employment, Status 26, increased from \$13,411 in FY 2011 to \$17,228 in FY 2013, a 28.5% increase.

Total expenditures for individuals terminated unsuccessfully, Status 28, after an IPE was implemented increased from approximately \$6.56 million FY 2011 to \$7.5 million in FY 2013. Approximately one third of the total VR expenditures during this time period were spent on individuals with SCI whose cases were closed unsuccessfully in Status 28. Specifically, the percentage of total expenditures for Status 28 closures was 32.7% in FY 2011, 31.4% in FY 2012, and 31.4% in FY 2013. The average VR expenditures per participant with SCI closed *unsuccessfully* after an IPE was implemented, Status 28, increased from \$6,896 in FY 2011 to \$8,060 in FY 2013, a 16.9% increase.

3.13. State VR Agencies employment outcomes

Nationally, the percentage of individuals with SCI closed in Status 26 with an employment outcome achieved relative to all closures with SCI was 30.8% in FY 2011, 31.4% in FY 2012, and 32.4% in FY 2013. This information is found in Table 9. Table 16 presents the states who had a higher percentage of cases closed in Status 26 than the national outcomes at or above 50% of terminations. State VR Agencies with a higher percentage of individuals closed with an employment

Table 15
Cost of VR services for individuals with SCI

Closure status	FY 2011	FY 2012	FY 2013
Total VR expenditures (All Applicants)	\$20,099,816 (n=3,217)	\$21,843,998 (n=3,098)	\$23,874,290 (n=2,890)
Total VR expenditures Status 26 closures	\$13,290,301 (n=991)	\$14,923,116 (n=972)	\$16,125,408 (n=936)
% of Total VR expenditures for Status 26 closures	66.1%	68.3%	67.5%
Average cost of services per participant closed in Status 26	\$13,411	\$15,353	\$17,228
Total VR expenditures Status 28 closures	\$6,564,992 (n=952)	\$6,866,610 (n=929)	\$7,503,860 (n=931)
Average cost of services per participant closed in Status 28	\$6,896	\$7,090	\$8,060
% of Total VR expenditures for Status 28 closures	32.7%	31.4%	31.4%

Table 16
Percent and number of individuals with SCI that were closed successfully in employment

State	FY 2011	State	FY 2012	State	FY 2013
Missouri	n = 96 58.3%	Missouri	n = 96 55.2%	New York	n = 127 49.6%
Alabama	n = 42 50%	Oklahoma	n = 37 48.6%	Missouri	n = 81 53.1%
Iowa	n = 41 53.7%	Nebraska	n = 19 57.9%	Oregon	n = 18 50%
Vermont	n = 14 57.1%	West Virginia	n = 15 46.7%	Nebraska	n = 11 54.5%
Nebraska	n = 13 53.8%	Delaware	n = 8 50.0%	South Dakota	n = 10 60%
Delaware	n = 8 50%				
Rhode Island	n = 6 50%				

outcome ranged from states with larger populations to smaller.

4. Discussion

Nationally, state VR agencies reported closing 3,217 cases in FY 2011, 3,098 cases in FY 2012, and 2,890 cases in FY 2013 in the four case closure codes: Status 08, Status 28, Status 30, and Status 26. This represents approximately a 10% drop in the number of case closures from 2011 to 2013. For each year in this time period, approximately three individuals with SCI exited VR with an employment outcome consistent with their IPEs while seven individuals exited unsuccessfully. Specifically, 991 individuals with SCI were closed in Status 26 during FY 2011, 972 in FY 2012, and 936 in FY 2013. Status 26 closure represents those cases closed successfully including the following outcomes: competitive employment (including supported employment), self-employment, state agency managed business enterprise, homemaker, and unpaid family worker. Very few individuals with SCI were closed in supported employment for Status 26 with less than 4% for each year of this time period.

A number of state VR agencies had success rates at or above 50%. The national success rates for individuals with SCI ranged from 30.8% in FY 2011 to 32.4% in FY 2013. The state VR agencies for Missouri and Nebraska were in the top 3 percentile positions in each of the three Fiscal Years. Both small and large states achieved higher than the national success rates during this time period. This current data does not provide information on why some states have a greater success rate with individuals with SCI than others. Future research should focus on these higher achieving states to determine what services and supports are resulting in higher outcomes.

The demographics of individuals whose cases were closed during this time period are consistent with the national statistics for spinal cord injury in the four Case Closure Codes. There were more males than females who terminated VR services during each of the three years with approximately 70% of the cases male versus females (30%). This information is consistent with data showing that there is a greater incidence of males with SCI (80.6 to 82%) than females (CDC, 2010; National Spinal Cord Injury Database, 2012). Other demographics found in this sample of individuals with SCI are consistent with the findings from the National Spinal Cord Injury Statistical Center (NSCISC). The NSCISC found that the average age at injury is 41.0 years; 66%

are Caucasian, 26.2% are African American, 0.9% are Native American, and 8.3% are Hispanic in origin. In comparison this sample found that the average age at application for VR services was 43 and approximately 75% were Caucasian, 25% were African American; 2% were Native American and 10% were identified as Hispanic or Latino. In addition, the majority of the individuals whose cases were closed in Status 26 during this time period were white/Caucasian, consistent with previous findings that minorities are less likely than whites to return to work after SCI (Krause et al., 1998; Ottomanelli & Lind, 2009; Phillips et al., 2012; Yasuda et al., 2002).

Total expenditures for all terminations increased from approximately \$20.1 million FY 2011 to \$23.87 million in FY 2013. Approximately two thirds of VR expenditures were expended on individuals closed successfully in employment during this time period. Average cost per participant was \$13,411 in FY 2011, \$15,353 in FY 2012, and \$17,228 in FY 2013. It should be noted that the number of individuals whose cases were closed successfully in Status 26 during this time period decreased as the total expenditures increased.

The top three services received by individuals who exited VR with an employment outcome consistent with their IPEs, were assessment, VR counseling and guidance, and rehabilitation technology. While the top three services received by individuals whose cases were closed unsuccessfully were assessment, VR counseling and guidance, and diagnosis and treatment. The most noticeable difference for these two groups was the difference in percentages for receiving rehabilitation technology as a service. Approximately 50% of the successful closures across all three years received this service as compared to less than 25% of those who were unsuccessful. While this report does not provide information on whether there is a relationship between successful employment outcomes and receipt of rehabilitation technology services, this finding suggests a need for further research in this area.

A small percentage of individuals with SCI had a bachelor's degree or higher at the time of application. College or university training is one of the primary services that can be received by participants in the VR program. However, the percentages of participants who received college or university training as a service were less than 25% across all three years for individuals whose cases were closed unsuccessfully in Status 28 and less than 16% for those closed successfully in Status 26. For those individuals whose cases were closed successfully, there was a slight increase

in the number of individuals existing services with an associate's, bachelors, master's degree, or higher, consistent with previous literature that suggests having a higher educational level impacts employment after injury (Blackwell et al., 2003; Hess et al., 2000; Marini et al., 2008; Ottomanelli & Lind, 2009; Tomassen et al., 2000; Yasuda et al., 2002). This is important to note given that some researchers have shown that postinjury educational milestones are important to postinjury employment (Krause et al., 2012).

There was a slight decrease in the percentage of SSI receipts from application to closure during this time period. However, there was a slight increase in the percentage of individuals who were receiving SSDI at closure than at application for individuals closed in Status 26. There are a variety of potential influences that could be impacting the reported increase in percent of SSDI recipients for individuals closed by VR in employment. For example, some individuals who start out on SSI are only working part time. They are earning under the Substantial Gainful Activity (SGA) guideline for the Title II SSDI programs (currently \$1,070 per month) and they are generating "credits" or quarters of coverage by working. These people were not eligible for this benefit when they first went to work. Since SSI is a federal welfare program, it is the payer of last resort. When eligibility for SSDI is established, SSA switches the person over to the DI program and either terminates SSI or reduces the SSI cash payment depending on how much in DI is payable. Another potential example is that individuals who were not eligible for DI on their own work record when they applied for VR services earn enough quarters of coverage to then establish eligibility for SSDI by the time they are closed in employment by Vocational Rehabilitation (O'Mara & Miller, Work Incentives Planning and Assistance National Training Center (WIPA-NTC). Personal Communication, July 18, 2014).

Information on employment outcomes including hours worked per week and earnings for individuals with SCI closed in Status 26 also are reported for this time period. Hours of weekly employment for individuals closed in employment held steady at approximately 29 hours for each of the three years. Approximately one half of the individuals were working part time as defined by working less than 35 hours per week. While the other half were working full time. This outcome also remained fairly steady during this time period with a very small percentage difference in those working full time versus part time. Average weekly earnings ranged from a low of \$468.56 in FY 2011 to a high of \$499.59 in

FY 2012. If this average wage is converted to an annual income across 52 weeks, individuals closed successfully in employment would be making approximately \$26,000 annually. For comparison, the 2014 poverty guidelines for four individuals living in the same household is \$23,850 (US Department of Health & Human Services, 2014). Future research is needed on the types of jobs that individuals with SCI are finding and potential ways to increase the outcomes of this group of individuals.

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