Economic Impacts of West Virginia Division of Rehabilitation Services on Consumers with Significant Disabilities:

A Realistic Return-on-Investment Model for State-Federal VR Programs

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Return on Investment

- Introduction
- Previous ROI Models
- WVDRS ROI Methodology
  - Step 1: Sampling
  - Step 2: Measures and Data Sources
  - Step 3: Data Collection
  - Step 4: Modeling Return on Investment
  - Step 5: Results
- Conclusion

Introduction

‣ Overview of WVDRS

‣ Uses for Return on Investment

‣ ROI in the VR Context

West Virginia Division of Rehabilitation Services (WVDRS)

‣ <u>Mission</u>: Promote quality employment outcomes and independence for persons with significant disabilities in the state

◦ <u>Primary Goal</u>: To optimally utilize fiscal and human resources to vocationally rehabilitate consumers with significant disabilities through effective and efficient management practices by providing qualified consumers the necessary VR and related services

Uses for Return on Investment

- ROI is a prominent factor in national level discussions about public vocational rehabilitation services
  - Impact on society
  - Funding decisions
  - Accessibility issues
  - Impact on the employment of individuals with significant disabilities

Uses for Return on Investment

▶ WVDRS uses the ROI model to:

◦ Empirically validate a strong and continuous return on investment for its VR program

◦ Annually measure the efficiency and accountability of the program

ROI in the VR Context

▸ The basic ROI is a ratio of administrative and service costs to benefits reflected in current and potential earnings of DRS consumers after receiving services and exiting the VR system

▸ Additional considerations
  ◦ Tax revenue from post-VR earnings for the state and federal government

  ◦ Reduction in Social Security payments

  ◦ Social benefits

Previous ROI Studies

▸Previous ROI Models

• Measures

• Data Sources

▸WVDRS ROI Models

Previous ROI Models

▸ Previous research has yielded a variety of useful ROI approaches that vary in:

- Sample selection

- Defining costs and benefits

- Use of a control group

- Types of measurements

- Data sources

- Length of time after case closure

Previous ROI Models (continued)

▸ Several ways of calculating benefits have been utilized:

  ◦ Wages (Cimera, 2009; Dean, 1991; Dean, Ashley, Schmidt, & Rowe, 2006; Dean & Rowe, 2010)

  ◦ Wages with Social Security savings (Greenblum, 1975)

  ◦ Wages, Social Security savings, and tax revenues (Hemenway & Rohani, 1999; Rogers , Sciarappa, Macdonald-Wildon, & Danley, 1995; Uvin, Karaaslani, & White, 2004)

▸ In addition, the sources of each one of these benefits vary from study to study

West Virginia Division of Rehabilitation Services 10

Previous ROI Models (continued)

▶ Data Sources for Wages

  ◦ SSA data linked to RSA data (Greenblum, 1975)

  ◦ Self-reported data (Rogers, et al., 1995)

  ◦ Survey instruments (Kenyon, Koshy, & Wills-Johnson, 2005)

  ◦ Existing RSA-911closure data (Cimera, 2009)

  ◦ Unemployment Insurance data (Dean, 1991; Dean et al., 2006; Dean & Rowe 2010; Hemenway & Rohani, 1999; Hollenbeck, 2008; Uvin et al., 2004; Wilhelm & Robinson, 2010)

Previous ROI Models (continued)

▶ Social Security Benefits and Sources

  ◦ SSA database (Greenblum, 1975)

  ◦ Self-reporting before and after services (Rogers et al., 1995)

  ◦ RSA-911 closure data (Hemenway & Rohani, 1999; Uvin et al., 2004)

  ◦ Include a Social Security Administration cost savings of 10% per benefit earnings (Hemenway & Rohani, 1999; Uvin et al., 2004)

Previous ROI Models (continued)

▸ Tax Revenues

◦ Generally estimated at a set percentage of gross wages for federal and state taxes combined, often 23% (Hemenway & Rohani, 1999; Rogers et al., 1995; Uvin et al., 2004)

◦ Past research has also estimated Social Security taxes as 6.2% of gross wages, Medicare taxes as 1.45% of gross wages, state taxes at a flat rate, and federal taxes at a 10% marginal rate (Hollenbeck,2008; Uvin et al., 2004)

West Virginia Division of Rehabilitation Services 13

Previous ROI Models (continued)

▸ Additional Benefits

- ◦ Kenyon et al. (2005) examined social benefits, including self-esteem, independence, health benefits, community integration, and worker skills, of consumers

- ◦ Hollenbeck (2008) and Uvin et al. (2004) attempted to estimate "fringe" benefits in addition to earnings in their model

Previous ROI Models (continued)

▶ Control Group Selection

◦ Collect information pre- and post-services from consumers through self-reporting (Rogers et al., 1995)

◦ Compare accepted applicants who received services with those who did not (Dean, 1991; Hemenway & Rohani, 1999; Uvin et al., 2004; Wilhelm & Robinson, 2010)

◦ Gibbs (1991) noted that pre-program information is inadequate by itself because of the nature of the VR system
  · Consumers often have rapid decline in wages or the ability to work because of significant disabilities, so it may be difficult or impossible to see these changes looking at pre-program data

West Virginia Division of Rehabilitation Services 15

Previous ROI Models (continued)

▸ Work-Life Estimates

◦ Future return on investment benefits (Misra, Bua-Iam, & Majumder, 1992)

◦ 30 year work-life estimate (Hemenway & Rohani, 1999; Uvin et al., 2004)

◦ The number of years between the average applicant's closure age and an expected retirement age of 65 (Wilhelm & Robinson, 2010)

West Virginia Division of Rehabilitation Services 16

Previous ROI Models (continued)

▸ Multiple Closures

- An estimated 33% of consumers have two or more cases (Dean & Rowe, 2010)

- It is important to include all consumers who received services, regardless of rehabilitation status
  - Dean and Rowe (2010) found 30 to 40% consumers who were closed "unsuccessfully" were actually working after they received rehabilitation services

Previous ROI Research– Summary

Greenblum (1975)	Used a linked database between SSA and RSA and presented wage and public benefit changes for approximately two years after closure.
Rogers et al. (1995)	Used a self-reporting sample of those with psychiatric disabilities to present wages and social security benefit changes over time. Estimated taxes using 23% of gross income. The cost-benefit ratio compared all this information to the total costs of a supported employment program.
Gibbs (1991)	Discussed different methodological approaches to outcome measures within vocational rehabilitation. Noted that using pre-program data is inadequate, as those who seek vocational rehabilitation may have a sudden need for services not reflected in wage or benefit data prior to application.
Kenyon et al. (2003)	This research utilized a survey instrument to determine wages for clients who closed from the Australian vocational rehabilitation program. It included taxes, public assistance, and wages in benefits for the cost-benefit analysis. The study also approached the issue of other non-quantifiable social benefits such as self-esteem.
Cimera (2009)	Used the RSA-911 application and closure data to examine VR clients with mental illness and their performance at closure using national data. Cimera made the important note that findings for one state cannot be generalized to other states because of economic and administrative differences.

Previous ROI Research–Summary (continued)

Hemenway & Rohani (1999) and Uvin et al. (2004)	These studies (for the states of Florida and Massachusetts) used U/I data for 8 years and compared wages, social security (from RSA-911 and carried forward in time), taxes (estimated as 23% of gross income) between those who received services (Status 26 and 28) and those who did not (Status 30). Using the difference between the two groups as the "benefit," they projected a 30 year work-life of benefits and savings to the public and compared to costs of service.
Hollenbeck (2008) and Uvin et al. (2004)	Assumed a constant growth model of wages from the U/I data for 10 to 20 years and compared to costs of services. This study also compared Status 30 to Status 26 and 28. Taxes were estimated (6.2% for social security, 1.45% Medicare, and 25% for state and federal taxes in the case of Massachusetts). It also included "fringe benefits" of 25%.
Dean & Rowe (2006 and 2010)	Noted that Status 28 should be used for costs and benefits because a large percentage of Status 28s actually generate wages after closure. Using U/I data, this looks at all application and closures back to 1998. Social Security was briefly discussed, but neither it nor taxes were included in the ROI.
Dean (1991)	Compared Status 26 and 28 to Status 30 using U/I data.
Wilhelm & Robinson (2010)	Used U/I data to compare Status 26 and 28 to Status 30 in order to estimate the differences and calculate economic impact similar to Hemenway and Rohani (1999). This study excluded all federal contributions to create a cost-benefit ratio for the state of Utah. It also assumed each client would work 24 years after closure (using a calculation between average client age and the age of retirement.)

WVDRS ROI Models

▸ The WVDRS ROI models bring together the key elements of many of these studies, and advocate a new strategy for estimating Social Security savings and state and federal tax revenues

WVDRS ROI Models (continued)

▸ Using a combination of existing techniques and new strategies to estimate benefits, this study offers two realistic and accessible ROI models for a public VR program

◦ Utilize efficient and accessible information

◦ Reduce reliance on estimates

◦ Broad scope of economic impact

◦ Replicable methodology for other state-federal VR programs

WVDRS ROI Models (continued)

▸ The following is a step-by-step guide to replicate the WVDRS ROI models using existing and accessible data readily available to all public VR agencies

Step-by-Step WVDRS ROI Methodology

‣ <u>Step 1</u>: Sampling Methodology

‣ <u>Step 2</u>: Measures and Data Sources

‣ <u>Step 3</u>: Data Collection

‣ <u>Step 4</u>: Modeling Return on Investment

‣ <u>Step 5</u>: Results

Step 1: Sampling Methodology

‣Sample Selection

‣Population Comparison

Sampling Methodology

- A total of 2,521 WVDRS cases were closed after services in Fiscal Year 2007*

  - 370 cases were selected at random for a margin of error of +/- 4.71% at a 95% confidence interval

    - "Unsuccessful" cases were also included

    - Due to the nature of the VR system, a control group was excluded from the research design

*(Status 26– Rehabilitated and Status 28– Closed after Services without Employment)

Population Comparison

	Population	Sample
Total Cases	2521	370
Closed Rehabilitated	1587 (63.0%)	236 (63.8%)
Mean Age at Application	28.0	26.7
Female	47.6%	50.8%
Minority	6.4%	8.1%
Less than High School Graduate at Application	50.5%	53.0%
High School Graduate and Above at Application	49.5%	47.0%
Mean Hours Worked per Week at Application	6.61	7.54
Mean Weekly Earnings at Application	$54.42	$62.65
Transitional Youth (Age <25 at application)	58.3%	63.5%
Primary Disability Sensory/Communicative	11.0%	14.1%
Primary Disability – Physical	34.9%	28.9%
Primary Disability – Mental	54.1%	57.0%
Primary Source of Support – Personal Income	15.4%	18.1%
No Medical Insurance at Application	27.8%	29.7%
Counties in WV represented	55 of 55	55 of 55

Step 2: Measures and Data Sources

▶Costs

- Administrative and Services

▶Benefits

- Wages

- Taxes

- Social Security Savings

Costs

▶ Administrative and service costs

  ◦ Extracted from RSA and WVDRS fiscal databases

    • Included all preceding and subsequent cases each client had on record

    • Administrative costs for years prior to 2001 were conservatively estimated at 2001 values

West Virginia Division of Rehabilitation Services 28

Data Sources- Costs

Data	Measurement	Source
Administrative Costs	$ per Quarter client was served at WVDRS. Value for each client was found by taking the average cost for all clients served in a given year and summing them for each year client was in the WVDRS electronic case management system (iECM). This included all preceding and subsequent cases the client had on record.	RSA-2 iECM at WVDRS
Cost of Services	$ for total services in each case (including preceding and subsequent) the client had with WVDRS. The actual amount for each individual client was reported.	RSA-911

Note. The RSA-911 is the Rehabilitation Services Administration summary of all cases closed in a fiscal year. The RSA-2 is the Rehabilitation Services Administration summary of all costs for a state VR program.

Benefits

- Wages
  - Derived from Unemployment Insurance (U/I) data
    - The most promising method of matching consumers to post VR wages
      - Ability to track wages over time
      - Data are typically available for 5 years prior to when it is accessed
      - Includes quarterly wages for each individual

    - When U/I data were unavailable, RSA wage data at closure were used (only for the closure quarter)

West Virginia Division of Rehabilitation Services 30

Benefits (continued)

▸ Medicare and Social Security Taxes
  ◦ Calculated using U/I wage data using standard deductions

▸ State and Federal Taxes
  ◦ Calculated using U/I wage data with 2009 withholding tables
    · Clients were assumed to be single and have one tax exemption for purposes of parsimony

▸ Social Security Savings
  ◦ A new method using U/I data and substantial gainful activity (SGA) limits

West Virginia Division of Rehabilitation Services 31

Social Security Savings

▸ To estimate discontinued SSI and SSDI payments:

1. Identify each client's SGA limit (based on blind or non-blind status)
2. Using U/I wages, determine the number of quarters the SGA was exceeded
3. Sum the quarterly savings

◦ Clients who had received payments at application but had stopped by closure were assumed to have benefited from WVDRS services

◦ Partial decreases in benefits were not included, making this a conservative estimate of the savings

Data Sources- Benefits

Data	Measurement	Source
Wages	Gross wages in $ per quarter for 3 years (12 quarters) including the quarter in which the case was closed. When U/I data were unavailable, this was supplemented by reported wages at closure data to determine the wages received in the closure quarter (but not in any subsequent quarters).	Unemployment Insurance (U/I) Data RSA-911
Social Security Savings	$ in SSI or SSDI benefit payments received by client at Closure or Application if the client stopped receiving Social Security benefits during services by achieving the SGA level.	RSA-911
Social Security Taxes	6.2% of Gross wages up to $106,800 annually	U/I Data
Medicare Taxes	1.45% of Gross wages annually	U/I Data
Federal Taxes	$ annually calculated using the federal employer withholding tables	U/I Data 2009 Federal Withholding Tables
State Taxes	$ annually calculated using the WV state employer withholding tables	U/I Data 2009 State Withholding Tables

Note. The RSA-911 is the Rehabilitation Services Administration summary of all cases closed in a fiscal year. The RSA-2 is the Rehabilitation Services Administration summary of all costs for a state VR program.

West Virginia Division of Rehabilitation Services 33

Step 3: Data Collection

‣Costs

• Sample → Extrapolation

‣Benefits

• Sample → Extrapolation

West Virginia Division of Rehabilitation Services 34

Data Collection

▸ Using the most accessible and available information:

◦ Find the cost for going through rehabilitation services for each closure in FY 2007

◦ Determine quarterly wages generated for three years after closure

◦ Estimate tax revenue and Social Security savings

Data Collection (continued)

▸ Total WVDRS Administrative and Service Costs

Sample	Population Extrapolation
$1,954,899	$13,312,865

Data Collection (continued)

▸ Cumulative Gross Wages

Year	Sample	Population Extrapolation
1	$3,633,491	$24,758,605
2	$7,337,226	$49,995,856
3	$10,780,033	$73,445,147

o 80.3% of all sample cases had U/I wage data in the system

Data Collection (continued)

- Cumulative Tax Estimates
  - Sample

Year	Federal Income Taxes	State Income Taxes	Social Security	Medicare
1	$232,517	$112,261	$225,276	$52,686
2	$489,338	$230,335	$454,908	$106,390
3	$750,276	$342,881	$668,362	$156,310

West Virginia Division of Rehabilitation Services 38

Data Collection (continued)

- Cumulative Tax Estimates
  - Extrapolation

Year	Federal Income Taxes	State Income Taxes	Social Security	Medicare
1	$1,584,368	$764,944	$1,535,034	$359,000
2	$3,334,346	$1,569,503	$3,099,743	$724,940
3	$5,112,383	$2,336,391	$4,554,219	$1,065,100

West Virginia Division of Rehabilitation Services 39

Data Collection (continued)

▸ Social Security Savings Estimates

Year	Sample	Population Extrapolation
1	$169,491	$1,154,912
2	$327,162	$2,229,282
3	$465,867	$3,174,418

West Virginia Division of Rehabilitation Services 40

Step 4: Modeling Return on Investment

‣Streamline Model

‣Inclusive Model

West Virginia Division of Rehabilitation Services 41

Modeling Return on Investment

▶ Two WVDRS–ROI Models

◦ Streamline Model
  • Uses actual administrative and service costs and gross wages from state unemployment insurance data

◦ Inclusive Model
  • Additionally incorporates estimates of state and federal taxes paid, as well as reduced Social Security payments

Streamline ROI Model

▸ Defined as a ratio of costs to benefits where:

◦ **Costs**= Administrative costs + costs of services

◦ **Benefits**= Gross wages for 12 quarters*

*includes the quarter in which the case was closed

Streamline ROI Model (continued)

- A simple formula to determine an actual three-year figure

- Minimize estimations of benefits

- Conservative method

Inclusive ROI Model

▸ Defined as a ratio of costs to benefits where:

◦ **Costs**= Administrative costs + costs of services

◦ **Benefits**= Net wages for 12 quarters*, tax
benefits, and Social Security savings

*includes the quarter in which the case was closed

West Virginia Division of Rehabilitation Services 45

Inclusive ROI Model (continued)

- Includes a broader societal scope of economic impact

- More realistic return estimates

- Enhances the current evaluative approach

West Virginia Division of Rehabilitation Services 46

Step 5: Results

▸Streamline Model

•Sample → Extrapolation

▸Inclusive Model

•Sample → Extrapolation

▸Short-Term Work Patterns

Streamline Model Results

$$\text{ROI} = \frac{\text{Total Cost of VR Services}}{\text{Gross Wages}}$$

Year	Total Costs	Cumulative Gross Wages	ROI
Sample			
1st Year	$1,954,899	$3,633,491	$1:$1.86
2nd Year	$1,954,899	$7,337,226	$1:$3.75
3rd Year	$1,954,899	$10,780,033	$1:$5.51
Extrapolation			
1st Year	$13,312,865	$24,758,605	$1:$1.86
2nd Year	$13,312,865	$49,995,856	$1:$3.75
3rd Year	$13,312,865	$73,445,147	$1:$5.51

Streamline ROI

3-year Extrapolation
ROI= $1:$5.51

$13,312,865 Investment
Total Cost of VR Services

$73,445,147 Return
3-year Cumulative Gross Wages

Inclusive Model Results

$$ROI = \frac{\text{Total Cost of VR Services}}{\text{Net Wages} + \text{Tax Benefits} + \text{Social Security Savings}}$$

Year	Total Costs	Total Benefit	ROI
Sample			
1st Year	$1,954,899	$3,802,982	$1:$1.95
2nd Year	$1,954,899	$7,664,388	$1:$3.92
3rd Year	$1,954,899	$11,245,900	$1:$5.75
Extrapolation			
1st Year	$13,312,865	$25,898,305	$1:$1.95
2nd Year	$13,312,865	$52,194,481	$1:$3.92
3rd Year	$13,312,865	$76,584,581	$1:$5.75

Inclusive ROI

3-year Extrapolation
ROI= $1:$5.75

$13,312,865 Investment
Total Cost of VR Services

$76,584,581 Return
3-year Cumulative Net Wages, Tax Benefits, and Social Security Savings

Short-Term (3-year) Work Patterns of WVDRS Sampled Cases

▸ Consumer work patterns after exiting the VR program are interesting to note

　◦ Each "year" is a combination of four quarters, so clients showing wages for one or more quarters were considered working for that year

Range	Still Working	More $	Less $	Not Working
1st Year to 2nd Year	88.7%	59.1%	29.6%	11.3%
2nd Year to 3rd Year	79.6%	50.5%	29.0%	20.4%

Conclusion

▸WVDRS-ROI Methodology

▸Replicating in Other States

▸Further Reading

▸Special Thanks

Conclusion

▸ Based on ROI data presented, the estimated cost of human capital investment on DRS consumers with significant disabilities is more than fully recovered in less than one-year of estimated earnings generated by DRS consumers after exiting the VR system

▸ The $1:$1.95 ROI after the first year clearly validates DRS program as being efficient and accountable state–federal VR program

WVDRS ROI Methodology

▶ This research on ROI at WVDRS presents a conservative and sophisticated methodology that is consistent with the latest literature and/or applications of ROI for public VR programs

◦ Well-grounded

◦ State and federal impact

◦ Reasonable

◦ Empirically tested

West Virginia Division of Rehabilitation Services 55

Advantages of the WVDRS ROI Model

▸ The DRS-ROI methodology also enhances the current evaluative approach by using realistic and precise definitions, data elements, and measurements for computing benefits and costs

◦ All data and information is readily available

◦ A new method for estimating Social Security savings

◦ Tax estimates based on state and federal withholding tables

West Virginia Division of Rehabilitation Services 56

Advantages of the WVDRS ROI Model (continued)

▶ Conservative estimates of costs and benefits
  ◦ Pre-2001 administrative costs are based on 2001 levels which are expected to be higher
  ◦ Reduction in Social Security payments were excluded, thus underestimating the actual level of savings
  ◦ Out of state wages were not included

▶ Precise measures
  ◦ Social Security savings based on individual SGAs and wages
  ◦ Quarterly wage information for each individual from the U/I database
  ◦ Costs include all previous and subsequent cases for each client

West Virginia Division of Rehabilitation Services 57

Advantages of the WVDRS ROI Model (continued)

- Readily available data sources
  - The ROI models rely on data that is available to all state-federal VR agencies

- Sample selection
  - Includes both "successful" and "unsuccessful" case closures

- Short-term return period
  - The WVDRS model demonstrates an ROI of $1:$5.75 within three years
  - Reduced dependence on work-life estimates

Replicating the WVDRS ROI Model

▸ By following the step-by-step instructions presented, other state-federal VR agencies can clearly replicate the DRS-ROI model to realistically measure and validate the efficiency and accountability of their VR programs

West Virginia Division of Rehabilitation Services 59

Further Reading on WVDRS ROI Models

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