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Improving vocational rehabilitation services for injured workers in Washington State

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ABSTRACT

Workers who incur permanent impairments or have ongoing medical restrictions due to injuries or illnesses sustained at work may require support from vocational rehabilitation programs in order to return to work. Vocational rehabilitation programs implemented within workers' compensation settings are costly, and effective service delivery has proven challenging. The Vocational Improvement Project, a 5.5-year pilot program beginning in 2008, introduced major changes to the Washington State workers' compensation-based vocational rehabilitation program. In the evaluation of this pilot program, set within a large complex system characterized by competing stakeholder interests, we assessed effects on system efficiency and employment outcomes for injured workers. While descriptive in nature, this evaluation provided evidence that several of the intended outcomes were attained, including: (1) fewer repeat referrals, (2) fewer delays, (3) increased choice for workers, and (4) establishment of statewide partnerships to improve worker outcomes. There remains substantial room for further improvement. Retraining plan completion rates remain under 60% and only half of workers earned any wages within two years of completing their retraining plan. Ongoing communication with stakeholders was critical to the successful conduct and policy impact of this evaluation, which culminated in a 3-year extension of the pilot program through June 2016.

1. Introduction

This paper reports on an evaluation of the Vocational Improvement Project (VIP), a pilot program that introduced major changes to the Washington State workers' compensation-based vocational rehabilitation program. These changes were designed to increase accountability and efficiency and to improve employment outcomes for injured workers. We conducted a process and impact evaluation of the VIP in order to provide information to stakeholders regarding whether the VIP should be extended on a permanent basis. This multifaceted evaluation is illustrative of the difficulties inherent in implementing and evaluating quality improvement programs within a complex system characterized by competing stakeholder priorities.

1.1. Background

While a substantial majority of injured workers are able to return to work (RTW) fairly soon after injury, others incur permanent impairments or have ongoing medical restrictions that require longer-term and more intensive support via vocational rehabilitation programs (MacEachen, Kosny, Ferrier, & Chambers, 2010; Washington State Department of Labor and Industries, 2012a). While representing a small proportion of injured workers, these claims are generally the most complex and costly, with the highest potential to result in permanent disability (Washington State Department of Labor and Industries, 2012a). The purpose of workers' compensation-based vocational rehabilitation programs is to facilitate RTW for workers who have been unable to return to their previous job after an occupational injury. Most states authorize some vocational rehabilitation benefits for injured workers via workers' compensation programs, but eligibility and covered services vary widely (Tanabe, 2012).

Vocational rehabilitation programs implemented within workers' compensation settings are costly, and substantial service delivery problems have been identified (Barth, Grob, Harder, Hunt, & Silverstein, 2008; KPMG LLP, 2009; MacEachen et al., 2010, 2012, 2013; McPherson, 2007; Sears & Wickizer, 2012). Despite the

Abbreviations: VIP, Vocational Improvement Project; RTW, return to work; L&I, Washington State Department of Labor and Industries; EI, Early Intervention; AWA, Ability-to-Work Assessment; PD, plan development; PI, plan implementation; OJT, on-the-job training; ESD, Washington State Employment Security Department.

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importance of vocational rehabilitation programs and the costs involved, e.g., nearly $50 million in Washington State in 2006 (Barth et al., 2008), there has been little workers' compensation-specific research regarding the efficiency and effectiveness of vocational rehabilitation in returning injured workers to work. However, several studies suggest that, despite widespread quality improvement efforts, there remains a great deal of room for vocational rehabilitation system improvement internationally (MacEachen et al., 2010, 2012, 2013; McPherson, 2007).

1.2. Vocational rehabilitation services for injured workers in Washington State

The goals of the vocational rehabilitation program managed by the Washington State Department of Labor and Industries (L&I) are to determine the worker's ability to RTW, develop a plan for retraining the worker if needed, and support the training effort once initiated (Washington State Department of Labor and Industries, 2012b). To accomplish these goals, L&I makes several types of referrals to private-sector vocational rehabilitation counselors. Early Intervention (EI) referrals, the most frequent type, are intended to assist an injured worker to RTW for the employer of injury or current employer. EI referrals include services such as discussing early RTW options with the employer, worker, and health care provider, identifying potential barriers to RTW, performing job analysis, and facilitating job modifications or accommodations if needed. Ability-to-Work Assessment (AWA) referrals provide L&I with information regarding a worker's employability or eligibility for further vocational rehabilitation services, including vocational retraining. A worker may be eligible for retraining if found: (1) not employable due to the effects of the industrial injury or occupational disease, (2) physically able to participate in training, and (3) in need of training to become employable. About 2% of all injured workers or 6% of those entitled to time-loss compensation are found eligible for vocational retraining annually (Washington State Department of Labor and Industries, 2012a). L&I makes plan development (PD) referrals for workers found eligible for retraining, bringing the vocational rehabilitation counselor and the worker together to develop a retraining plan that is submitted to L&I for approval. The plan must address the worker's medical conditions and restrictions and other barriers to RTW, such as lack of education and experience, lack of skills, language difficulties, and availability of employment in the worker's labor market. After a retraining plan has been approved by L&I, a plan implementation (PI) referral is made to initiate retraining activities. Fig. 1 depicts how a claimant might progress through the vocational rehabilitation process and the expected order of the various referral types.

1.3. Description of the Vocational Improvement Project (VIP)

Like many workers' compensation-based vocational rehabilitation programs, the program managed by L&I has faced a number of challenges and has evolved over time. L&I has a long history of collaborative efforts with stakeholders to improve program performance (Barth et al., 2008; Sears & Wickizer, 2012). According

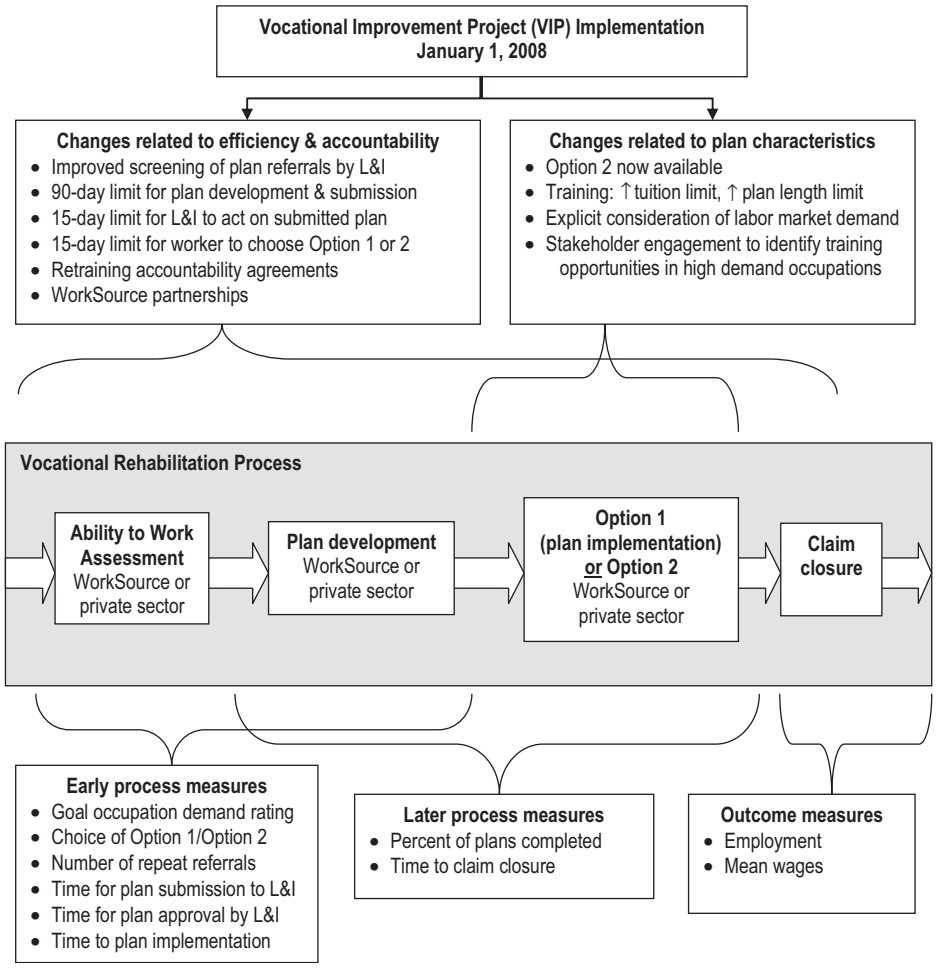

Fig. 1. Diagram of programmatic changes and evaluation measures. L&I, Washington State Department of Labor and Industries.

to L&I, the legal framework that existed prior to the VIP presented several challenges to successful RTW (Washington State Department of Labor and Industries, 2012a). First, training programs for workers were capped at one year and $4000. This limited benefit did not allow access to the majority of programs available at community and vocational technical colleges. Second, there were no mechanisms to allow workers to decline participation, although anecdotal evidence suggested that at least some workers would prefer not to undertake retraining. Third, the system experienced unnecessary costs related to delays and unproductive attempts at plan development and retraining. And finally, L&I had no established links to other organizations in the state that were also focused on helping people with employment and training needs.

In response to these issues, legislation was passed in 2007 to implement the VIP on a pilot basis from January 1, 2008 through June 30, 2013. This legislation, Engrossed Substitute Senate Bill 5920, directed the implementation and evaluation of a number of fundamental changes in the design and operation of vocational rehabilitation services. The stated goal of the VIP was to "allow opportunities for eligible workers to participate in meaningful retraining in high demand occupations, improve successful return to work and achieve positive outcomes for workers, reduce the incidence of repeat vocational services, increase accountability and responsibility, and improve cost predictability." This legislation also directed L&I to create a VIP subcommittee with both business and labor membership that would be responsible for making recommendations to L&I and the Legislature regarding program implementation and any additional statutory changes needed. Finally, the legislation mandated an independent evaluation of the VIP. The VIP imposed changes to many aspects of the vocational rehabilitation process, and was complex to evaluate. As shown in Fig. 1 and described in detail below, the changes fell into two basic areas: (1) changes related to efficiency and accountability, and (2) changes related to plan characteristics, including enhancement of retraining benefits and choices.

A major focus of the pilot program was on moving workers through the vocational rehabilitation process more efficiently while reducing repeat referrals. Although repeat vocational referrals are not always unwarranted, the presence of repeat referrals for the same service is a potential indication of inefficiency and other problems with the progress of a claim. Several new time limits were established, including a 90-day limit for vocational rehabilitation counselors to develop retraining plans and submit them to L&I, and a 15-day limit for L&I to act on (approve/reject) a submitted plan. Other changes included screening of vocational referrals by specialized L&I staff, requiring accountability agreements for the retraining plan, and defining acceptable reasons for interrupting a plan. These changes were intended to reduce delays, reduce repeat referrals, lead to faster development of viable retraining plans, increase accountability, and improve retraining plan completion rates.

The VIP required L&I to establish new partnerships with WorkSource, a joint venture of state and local government and community agencies that provides services such as free use of computers and other career resources, job and training referrals, workshops on how to get a job, and translation services. Prior to the VIP (and since 1981), L&I had been sending vocational referrals exclusively to private sector vocational rehabilitation service providers. Under the VIP, L&I hired vocational rehabilitation counselors that were stationed at six existing WorkSource locations. Vocational referrals can now be made either to WorkSource-based or private-sector vocational rehabilitation counselors, at the discretion of L&I staff (based on service history, availability, location, etc.).

The pilot program enhanced retraining benefits and choices in several ways. It doubled the maximum allowable length of a retraining plan from 12 months to 24 months. The maximum tuition allotment was tripled to $12,000 in 2008, and subsequently indexed to changes in Washington's community college tuition rates. One anticipated outcome of the increased retraining duration and cost limits was that workers would be able to obtain higher wage jobs. In addition, the VIP was intended to provide better support to workers involved in on-the-job training (OJT) and to increase marketing of OJT training opportunities with employers.

The VIP legislation also stated that the pilot program was intended to allow opportunities for participation in meaningful retraining in high demand occupations. The Washington State Employment Security Department (ESD) posts a list of occupations and their associated demand ratings, developed and updated by Local Workforce Development Councils. Occupations for which there are sufficient data are grouped into the following categories based on local labor market conditions: (1) demand, (2) balanced, or (3) not in demand. For each particular occupation, the demand rating can vary by geographic location and over time. Labor market demand is not the only important or necessary criterion for vocational rehabilitation counselors to consider when identifying goal occupations; however, under the VIP, demand was to be explicitly considered, with the goal of improving employment outcomes.

In addition, the VIP provided a new option for workers to elect self-directed training (Option 2) as an alternative to participating in an identified formal retraining plan (Option 1). Option 2 provided a mechanism for workers to choose not to participate in the specific retraining plan approved by L&I. Workers have 15 days after plan approval to decide whether to participate in the approved plan or choose Option 2. When workers choose Option 2, their claim is closed, time-loss benefits end, and a vocational award is paid. The vocational award, equivalent to six months of time-loss benefits, is meant to provide a financial cushion during the transition to self-directed retraining and/or employment. In addition, vocational retraining funds are set aside, which the worker can access for tuition, training fees, and certain related expenses for up to five years. The worker can seek training at any licensed, accredited, or L&I approved program or course. The retraining goal does not need to be approved by L&I.

2. Methods

2.1. Data sources and sample

Washington State has a single payer workers' compensation system (the State Fund) that covers approximately 70% of workers specified by the Industrial Insurance Act (State of Washington), and is one of only four states with an exclusive state fund (Tanabe, 2012). Self-insured employers account for the balance; no private workers' compensation insurers operate in Washington. L&I performs the functions of an insurer for State Fund claims and administers the state workers' compensation system for both State Fund and self-insured employers, allowing for population-based research (Franklin & Fulton-Kehoe, 1996; Franklin, Wickizer, Fulton-Kehoe, & Turner, 2004).

The scope of this evaluation included both State Fund and self-insured claims. L&I maintains detailed administrative data regarding vocational services utilization and outcomes for State Fund claims. Data for self-insured claims are much more limited, particularly prior to 2008. Rules to implement the VIP addressed this by identifying new reporting requirements for self-insured claims. However, due to the lack of historical data, self-insured claims were excluded from pre-post analyses. These two populations are quite distinct; all self-insured employers are large

employers, and injured workers in the self-insured group are more likely to be female, older, reside in an urban county, and have higher pre-injury wages on average (Sears & Wickizer, 2012).

The complete sample included State Fund and self-insured workers' compensation claims that had any relevant vocational rehabilitation referrals between January 1, 2006 and December 31, 2011. Injured workers who were under 18, who were L&I employees, or who were known to reside outside Washington State were excluded. There were a total of 57,048 claims, for which L&I provided all relevant claim and ESD wage data through December 31, 2012. Subsamples were selected as appropriate for each analysis. The Washington State Institutional Review Board approved this study.

All measures of pre-injury and RTW wages were based on earnings reported to ESD. L&I has a contract with ESD allowing the use of wage files for specific research purposes; these wage files are delivered quarterly by ESD to L&I. L&I linked wage files to claims data and transmitted these files to our research group, providing data regarding quarterly wages and hours worked. ESD wage data includes those workers covered by unemployment insurance, representing over 86% of total employment in Washington (Washington State Employment Security Department, July 2012). Non-covered employment includes self-employment and a variety of narrowly defined exceptions.

2.2. Evaluation plan

This evaluation was conducted using a population-based pre-post (baseline-VIP) design (with no comparison group) along with descriptive post-only (VIP-only) comparisons between groups exposed to various features of the VIP. Fig. 1 depicts the programmatic changes that were implemented under the VIP and the measures we used to capture the effects of those changes. This evaluation approach was developed in collaboration with L&I and stakeholders and was designed to address the elements required by Engrossed Substitute Senate Bill 5920 and supplementary elements requested by L&I.

Although the legislation required that an evaluation be conducted, it did not contain language which would facilitate the construction of a comparison group. The legislation set January 1, 2008 as the date for statewide implementation, and there was no staggered roll-out of most features or randomization of any kind. In addition, the near-simultaneous impact of the severe economic recession (which occurred very shortly after VIP implementation and after the evaluation had been designed) posed challenges to the pre-post design for employment outcomes in particular. Despite our efforts, no adequate comparison group could be identified to support a natural experiment-based design or to enable control for self or system-based selection into various new features of the VIP.

Our primary motivation in identifying baseline and VIP periods for the pre-post analyses was to ensure to the extent feasible that the baseline and VIP samples were comparable, both in terms of having been exposed only to baseline or only to VIP practices and in terms of the amount of time available to observe specific events. The event(s) used to assign workers to baseline or VIP periods (or to exclude them) were specific to each analysis (e.g., plan approval date, first start date of a specific type of referral).

The baseline period for all pre-post comparisons presented here was January 1, 2006 through June 30, 2007. The baseline period was set to begin after the implementation of an earlier vocational improvement initiative in 2005, in order to minimize confounding. The baseline period excluded July 1, 2007 through December 31, 2007 because there were anticipatory practice changes during the transitional six months leading up to implementation of the VIP.

Two separate VIP time periods were used to create samples for the pre-post analyses. The samples for plan completion and employment outcomes included plans approved from January 1, 2008 through June 30, 2009, to ensure adequate follow-up time for plans to complete and employment outcomes to be observed prior to December 31, 2012. The samples for shorter-term efficiency measures included referrals with start dates from January 1, 2010 through June 30, 2011. For the efficiency measures, the primary interest was in observing processes after the transition to VIP had stabilized and long-term observation was not required.

2.3. Stakeholders

Because this evaluation was mandated in statute and would contribute to decisions about program extension, its design and findings held potential for political repercussions. Thus, it was important to establish early and ongoing communication with stakeholders, including employers, worker representatives, and vocational rehabilitation professionals (Franche, Baril, Shaw, Nicholas, & Loisel, 2005; Franklin et al., 2004; Sears & Hogg-Johnson, 2009; Young et al., 2005). This was accomplished in part through frequent communications with L&I staff and quarterly briefings to the VIP subcommittee regarding the substance and progress of the evaluation. The L&I Vocational Technical Stakeholders Group, which includes vocational rehabilitation professionals and serves as a resource for L&I's policy and program decision-making, was also involved in discussions about implementation and evaluation of the VIP. The authors reported evaluation findings annually to the Legislature. The final evaluation report is available online (Sears & Wickizer, 2012). However, many of the analyses presented in this paper, particularly those involving employment outcomes, are based on more recent and complete data.

2.4. Data analysis

All statistical tests were two-tailed, with statistical significance defined as $p \leq .05$. All regression models incorporated robust variance estimates. All analyses were conducted using Stata/SE 11.2 for Windows (StataCorp LP, College Station, TX).

2.4.1. Repeat referrals

The likelihood of repeat referrals was analyzed separately for each distinct referral type (AWA, PD, and PI), comparing the VIP with baseline. To construct comparable samples for each referral type, we assigned each State Fund claim to the baseline or VIP period (or excluded it) based on the start date for the very first referral of the referral type being assessed. (Note that a claim might fall into different categories for each of the three referral types and therefore be variously included or excluded for each of the three analyses.) We then counted the number of repeat referrals for each claim that occurred within the same 18-month baseline or VIP time window. Although this strategy limited the length of time each claim could be observed, it ensured that the samples were comparable in terms of having been exposed either to only baseline or to only VIP practices. We calculated the observation period available for each included claim by counting the number of days remaining in the allotted time window after the first referral, and then subtracting the number of days that the claim was in closed status after the first referral (when no referrals were possible). We used this claim-level observation time as an offset in Poisson count models to produce the incidence rate ratio (IRR) for repeat referrals under VIP compared with baseline, which provided the basis for estimates of percent change in repeat referrals.

Retraining plans exist in one of three states once initiated: (1) ongoing, (2) completed and terminated, or (3) terminated prior to

completion (incomplete). Incomplete plans often lead to repeat retraining plan referrals. We assessed the percentage of plans completed, comparing VIP to baseline. For this comparison, it was necessary to construct samples for which all or nearly all plans had terminated (whether completed or not). Survival analysis was not suitable because the VIP doubled the maximum allowable plan length from 12 months to 24 months, making direct comparison of time from start date to completion date untenable. One baseline State Fund plan and six VIP State Fund plans were excluded because they had not yet been terminated. (As a sensitivity analysis, we included the ongoing plans by assuming that all were terminated as incomplete, which had negligible impact on the findings.)

2.4.2. Efficiency

We assessed several efficiency measures that might have been affected directly or indirectly by the VIP and that would affect overall claim duration: (1) time from PD referral to plan submission to L&I, (2) time from PD referral to retraining, (3) time from plan completion to claim closure, and (4) the percentage of plans not approved by L&I within 15 days. Cox proportional hazards regression including a VIP (vs. baseline) indicator was used for the first three measures listed. A Chi^2 test of independence was used to test VIP vs. baseline differences for the fourth measure.

The samples constructed for the first two analyses listed above consisted of those State Fund claims with a first-time PD referral occurring within either the baseline or the VIP period. Time to plan submission was calculated by subtracting the first PD referral date from the first subsequent plan submission date occurring within the same baseline or VIP time window. Later plan submissions were treated as unobserved and censored. Time to retraining was calculated by subtracting the first PD referral date from the first subsequent PI referral date occurring within the same baseline or VIP time window. Later PI referrals were censored. Option 2 plans were excluded from the analysis of time to retraining, because claim closure occurs before any worker-directed retraining.

In order to assess time from plan completion to claim closure, samples were constructed based on the completed plan termination date occurring within either the baseline or the VIP period. Time to claim closure was calculated by subtracting the completed plan termination date from the first subsequent claim closure date occurring within the same baseline or VIP time window. Later claim closures were censored. Plans were included only if the retraining plan was completed and the worker was determined employable, since other scenarios might not call for claim closure. By definition, Option 2 plans were also excluded.

2.4.3. Employment outcome models

Employment outcome models fell into two basic categories: (1) assessing VIP-only differences based on the presence or absence of various plan or referral features related to the VIP, in which case both State Fund and self-insured claims were included, along with an indicator for the feature of interest, and (2) assessing differences between VIP and baseline claims, in which case only State Fund claims were included and a VIP-baseline indicator was set for each observation. Although these comparisons included the many covariates described below, they were essentially descriptive in nature, since there were no predetermined comparison groups and the influence of various selection factors was unknown. We used employment outcome models to make comparisons between the following categories of interest: (1) retraining plans with job goals that were rated high demand vs. those rated balanced or not in demand, (2) OJT plans vs. formal retraining plans, (3) longer plans (1–2 years) vs. plans under 1 year,[1] (4) WorkSource referrals vs. private sector referrals for State Fund claims (separate models for EI and AWA referrals),[2] and (5) Option 1 vs. Option 2. The pre-post models (comparing VIP with baseline) only included State Fund claims, since much of the necessary information was not available for baseline self-insured claims. We used three different samples for the pre-post models: (1) just those workers who completed retraining plans (to focus on changes in plan characteristics/quality), (2) all workers undertaking plans regardless of plan outcome, but excluding Option 2 (which included effects on employment outcomes related to plan completion rates), and (3) all workers regardless of plan outcome or option choice (for an overall assessment of the VIP). Employment outcomes were followed until December 31, 2010 for the baseline group, and until December 31, 2012 for the VIP group, an equivalent length of time (later outcomes were censored). To avoid contamination from baseline to VIP, we only included those workers with a first-time retraining plan approval in either the baseline or VIP window and compared outcomes for the first plan undertaken by each worker.

All pre-injury and RTW wage measures were based on earnings reported to ESD by the end of 2012, providing up to 20 quarters (5 years) of observation time, depending on the particular analysis. Wages were standardized to January 2008 using the Consumer Price Index. Workers who had an invalid Social Security number or who were injured prior to 1999 were excluded due to unavailable ESD data, as were deceased workers and workers with total permanent disability.

Employment outcomes were assessed using the following five modeling approaches. Multiple measures were used because stakeholders had varied and somewhat conflicting perspectives about what would constitute an acceptable employment outcome.

2.4.3.1. Timely RTW (any wages in quarter that referral/plan ended). This approach used logistic regression to estimate the presence of any ESD wages in the same quarter that the relevant referral or plan ended. This model estimates an odds ratio, or the odds of timely RTW for the group of interest relative to the reference group (an odds ratio of precisely 1 would signify no difference between groups). In addition to the other covariates described below, these models included the number of days between the first day of the quarter in which the referral/plan ended and the date that observation of ESD wages began (0–91), because workers with referrals ending later in the quarter would have less time to RTW before that quarter ended than would workers with referrals ending early in the quarter.

2.4.3.2. Sustained RTW (any wage level). This approach used negative binomial regression to estimate the number of quarters with any ESD wages. This model estimates an incidence rate ratio, or the "rate" of the number of quarters with observed ESD wages given the number of quarters available to observe ESD wages (exposure), for the group of interest relative to the reference group. (An incidence rate ratio of precisely 1 would signify no difference between groups.)

2.4.3.3. Sustained RTW (at or above pre-injury wage). This approach was the same as the previous approach, with one exception: the

[1] Approved plan length was not available in the administrative data extract. For the purposes of this evaluation, L&I staff individually looked up the initial approved plan length for each plan approved in 2008 only; thus plan length-related analyses were restricted to plans approved in 2008.

[2] There were too few PD or PI referrals to WorkSource to enable comparison with private vocational rehabilitation counselors regarding employment outcomes for plan-related activities. Instead, we compared employment outcomes for workers with EI or AWA referrals that were found "ready to work" (they had been assigned a referral outcome code of either "able to work" or "returned to work").

employment measure was the number of quarters with adjusted ESD wages that were at least 100% of the average quarterly adjusted pre-injury ESD wages, given the number of quarters exposed. This is a much harder standard to meet, especially in the face of the severe economic recession.

2.4.3.4. Ever RTW (first occurrence of any wages). This approach used Cox proportional hazards regression to estimate time (measured in quarters after the relevant referral or plan ended) to the first occurrence of any ESD wages. This model estimates a hazard ratio, or the average probability over time of the occurrence of any ESD wages for the group of interest relative to the reference group.

2.4.3.5. Post-RTW mean wages. This approach used linear regression to estimate mean wages (measured as average quarterly wage over the four quarters after the first RTW quarter). One expected outcome of the increased retraining duration and cost limits was that workers would be able to obtain higher wage jobs. Only workers who returned to work were included in these models; thus differences in the proportion of workers returning to work were not captured. We used this approach only when there was an a priori hypothesis that mean wages were an important outcome measure for a particular feature of the VIP. Specifically, we estimated mean RTW wages for longer plans (>1 year) compared with shorter plans, and for workers undergoing OJT plans compared with those undergoing formal retraining plans.

Covariates used in the employment outcome models included: (1) age, (2) gender, (3) married, (4) any dependents, (5) preferred language not English, (6) occupational disease (vs. injury), (7) adjusted pre-injury ESD wages (quarterly ESD wages averaged over the four quarters prior to the injury quarter), (8) North American Industry Classification System (NAICS) industry sector of injury (set of nine indicators), (9) large employer (employer of injury employed 50+ full time equivalents), (10) unemployment rate for county of residence and month/year of labor market re-entry, (11) rural/urban residence county, (12) number of quarters since injury, (13) number of months since referral start date or plan approved, and (14) State Fund/self-insured (models that included both SF & SI claims). Preferred language and occupational disease were unavailable for self-insured claims and were included only in models that excluded self-insured claims. More detailed descriptions of each data field and variable construction can be found online (Sears & Wickizer, 2012).

3. Results

3.1. Repeat referrals

As shown in Table 1, State Fund workers were substantially less likely to have one or more repeat referrals of the same type (AWA, PD, and PI) under the VIP compared with baseline. We found that 58.7% of baseline State Fund plans had been completed at plan termination, compared with 56.0% of VIP State Fund plans (difference not significant; $N = 3363$). There was no evidence for an association between initial approved plan length and plan completion rates.

Table 1
Percent change in repeat referrals for VIP compared with baseline (State Fund only).

Referral type	*N*	% change	95% CI	*p*-Value
Ability to work assessment (AWA)	19,895	↓39%	↓34%–↓43%	<.001
Plan development (PD)	5436	↓28%	↓16%–↓39%	<.001
Plan implementation (PI)	3903	↓36%	↓19%–↓49%	<.001

VIP, Vocational Improvement Project.

Table 2
Efficiency measures for VIP compared with baseline (State Fund only).

Measure	*N*	Hazard ratio	95% CI	*p*-Value
Time from PD referral to plan submission to L&I	5410	2.22	2.05, 2.40	<.001
Time from PD referral to retraining	4792	1.42	1.30, 1.55	<.001
Time from plan completion to claim closure	1619	1.40	1.24, 1.58	<.001

VIP, Vocational Improvement Project; PD, plan development; L&I, Washington State Department of Labor and Industries.

3.2. Efficiency

As shown in Table 2, efficiency was significantly improved under the VIP compared with baseline for three separate duration-based measures: (1) time from PD referral to plan submission to L&I for approval, (2) time from PD referral to retraining, and (3) time from plan completion to claim closure (for completed plans that resulted in a determination that the worker was employable). Under the VIP, plans were more than twice as likely to be submitted to L&I at any point in time after PD referral, on average, compared with baseline plans. Fig. 2 depicts the instantaneous probability of a plan having been submitted to L&I as a function of time since PD referral. The difference in probability of plan submission between VIP and baseline increased sharply beginning about 30 days after the PD referral and peaked at about 130 days, with VIP and baseline probabilities appearing to converge after about 330 days. This observed pattern suggests that the VIP's new 90-day submission requirement was the mechanism encouraging timelier plan submissions. In addition, there was a significant reduction in the percentage of State Fund plans that took more than 15 days to be approved by L&I, from 6.6% in the baseline period to 1.7% in the VIP period ($p < .001$; $N = 4469$).

3.3. Employment outcome models

3.3.1. Plan characteristics

The percentage of State Fund and self-insured plans with high demand goal occupations gradually rose over time (see Fig. 3). There was no evidence that high demand goal occupations resulted in significantly better employment outcomes, using any of the four RTW measures (see Table 3).

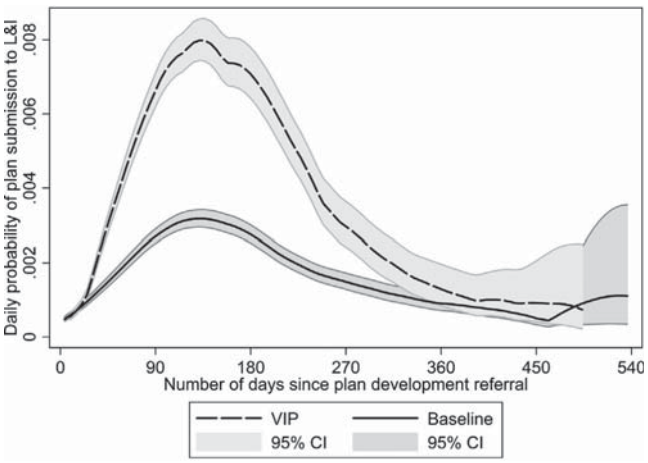

Fig. 2. Probability of plan submission after plan development referral, comparing the Vocational Improvement Project (VIP) to baseline (State Fund only). L&I, Washington State Department of Labor and Industries.

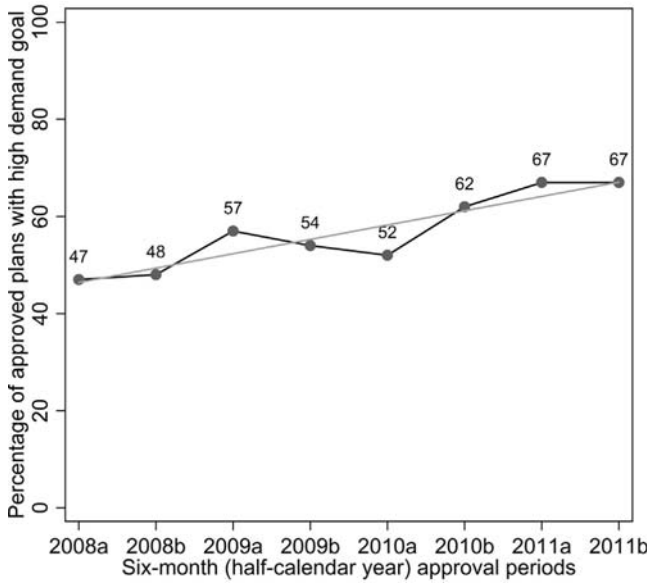

Fig. 3. Percentage of Vocational Improvement Project (VIP) retraining plans with high demand goal occupations, over time (State Fund and self-insured).

A significantly lower percentage of State Fund plans involved OJT under the VIP; 2.7% compared with 9.8% at baseline ($p < .001$). Although there were only 52 completed OJT plans eligible for the post-VIP analysis, OJT was strongly associated with better employment outcomes using three of the four RTW measures; sustained RTW at/above pre-injury wage exhibited the same direction of effect but was not statistically significant (see Table 3).

In contrast, there was no evidence that longer plans were associated with better RTW outcomes (Table 3). In fact, timely RTW was significantly less likely for plans lasting 1–2 years compared with plans of 1 year or less. To further investigate plan length, we examined RTW patterns for four plan length subgroups. Table 4 presents the number of completed plans approved in 2008 in each of the four subgroups as well as the distribution of plan length for that subset of OJT plans. Fig. 4 shows the estimated probability of the first occurrence of any ESD wages at various points in time for each of the four plan length subgroups. These data suggest that the shortest plans (up to six months in length) were the driver of the observed difference in timely RTW between longer and shorter plans. The RTW patterns for the other three plan length groups appear very similar.

We compared average adjusted quarterly wages during the year after first RTW for those who completed retraining plans lasting longer than one year to wages for those completing shorter plans (just among the 242 workers who did RTW and for whom we had at least a year of ESD data available; 175 longer plans and 67 shorter plans). Adjusted quarterly wages were an estimated $1274 higher for longer plans (95% CI: $88, $2461; $p = .035$). We also compared average adjusted quarterly wages for the year after first RTW for those who completed OJT plans to wages for those completing formal retraining plans (just among the 420 workers who did RTW and for whom we had at least a year of ESD data available; only 23 of those were OJT plans). Although the difference was not statistically significant, adjusted quarterly wages were an estimated $471 lower for OJT plans (95% CI: −$2115, $1172).

3.3.2. Option 2

Option 2 was chosen by 28% of workers with State Fund claims and 31% of workers with self-insured claims. As shown in Table 3, there were no significant differences in average employment outcomes between Option 1 (measured after retraining) and Option 2 (measured after option choice), except that Option 2 workers were less likely to RTW immediately.

3.3.3. WorkSource

The planned rollout of L&I vocational staff to be based at six WorkSource locations was slowed due to the state hiring freeze, staff turnover, and recruitment challenges. There were relatively few WorkSource referrals (involving only 1.3% of State Fund claims) and EI referrals comprised the vast majority. There were too few PD or PI referrals to enable comparison between

Table 3
Adjusted employment outcome models (wage data).

Model	Timely RTW Odds ratio	Sustained RTW any wage Incidence rate ratio	Sustained RTW ≥ pre-injury wage Incidence rate ratio	Ever RTW Hazard ratio
VIP-only (post-only) models				
High demand[a]	0.98	0.99	0.75*	0.98
On-the-job training (OJT)[b]	4.78*	1.51*	2.07	1.51*
Longer plans (>1 year)[c]	0.39*	0.97	0.86	0.99
Option 2[d]	0.72*	0.95	1.00	0.92
WorkSource: EI[e]	1.73*	1.07	1.24*	1.07
WorkSource: AWA[f]	1.15	1.24	1.41	1.16
VIP-baseline (pre-post) models				
VIP (completed plans)[g]	0.96	0.97	0.67	1.06
VIP (all plans, not Option 2)[h]	0.60*	0.71*	0.49*	0.78*
VIP (all plans and Option 2)[i]	0.43*	0.70*	0.57*	0.70*

Note: All models included the covariates listed in the last paragraph of Section 2.4.3. Roughly speaking, an estimate above 1 means a higher odds/likelihood of better employment outcomes for plans/referrals with the particular characteristic relative to others (for VIP-only models), or for VIP workers relative to workers at baseline (for VIP-baseline models).

VIP: Vocational Improvement Project; RTW: return to work; OJT: on-the-job training; EI: Early Intervention; AWA: Ability-to-Work Assessment.

[a] 815 workers with high demand plans and 692 workers with other plans were included in these models.
[b] 52 workers with OJT plans and 1518 workers with formal retraining plans were included.
[c] 408 workers with plans >1 year and 120 workers with shorter plans were included.
[d] 1679 Option 2 workers and 2841 Option 1 workers were included.
[e] 165 WorkSource referrals and 4243 private referrals were included.
[f] 45 WorkSource referrals and 8757 private referrals were included.
[g] 962 baseline workers and 650 VIP workers were included.
[h] 1509 baseline workers and 1065 VIP workers were included.
[i] 1509 baseline workers and 1449 VIP workers were included.
* Statistically significant at $p \leq .05$.

Table 4
Distribution of approved plan length (for retraining plans approved in 2008 and completed by December 31, 2012).

Approved plan length	All plans		OJT plans	
	N	Percent	*N*	Percent
Up to 6 months	48	8%	4	24%
Over 6–12 months	80	14%	8	47%
Over 12–18 months	69	12%	0	0%
Over 18–24 months	375	66%	5	29%
Total	572	100%	17	100%

OJT, On-the-job training.

WorkSource-based and private vocational rehabilitation counselors regarding employment outcomes for plan-related activities. Instead, we compared employment outcomes for workers with EI or AWA referrals who were found "ready to work" (meaning they had been assigned a referral outcome code of either "able to work" or "returned to work"). Table 3 presents the results of these models. There was some evidence, particularly for EI referrals, that those workers referred to WorkSource had better employment outcomes. There were very few AWA referrals ($N = 45$), which likely contributed to the lack of statistical significance for those models.

3.3.4. Comparison of VIP with baseline

Results for the three different VIP-baseline models are presented in the last three rows of Table 3. Among workers with completed plans, there were no significant differences in any of the four employment outcome measures for VIP workers compared with baseline workers. However, when the models were broadened to also include workers who had not completed their plans and/or workers who chose Option 2, VIP workers fared significantly worse on all four employment outcome measures compared with baseline workers.

3.4. Proportion of workers who RTW over time

Fig. 5 depicts the proportion of workers having any ESD wages by the number of quarters since retraining plan termination. Roughly 30% of workers had RTW by about six months after retraining plan completion, 40% by about one year, and 50% by about two years, leveling off to 60% after three years. An even lower percentage of workers with incomplete plans had ever RTW, remaining under 45% nearly five years later. (RTW is defined here as having earned any ESD wages, no matter how few or how briefly.)

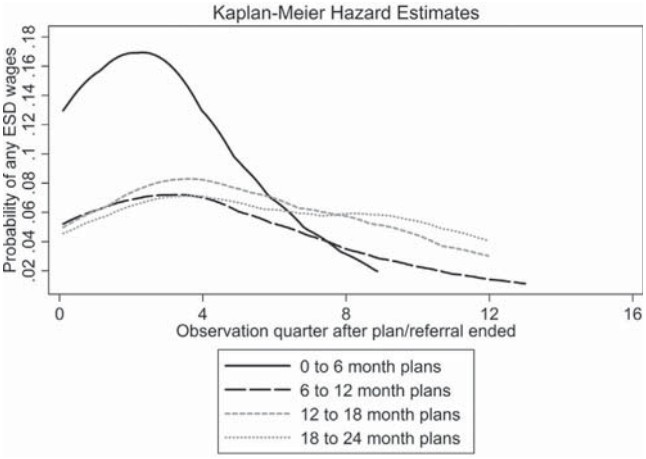

Fig. 4. Probability of first occurrence of any wages over time by plan length category (for retraining plans approved in 2008 and completed by December 31, 2012). ESD, Washington State Employment Security Department.

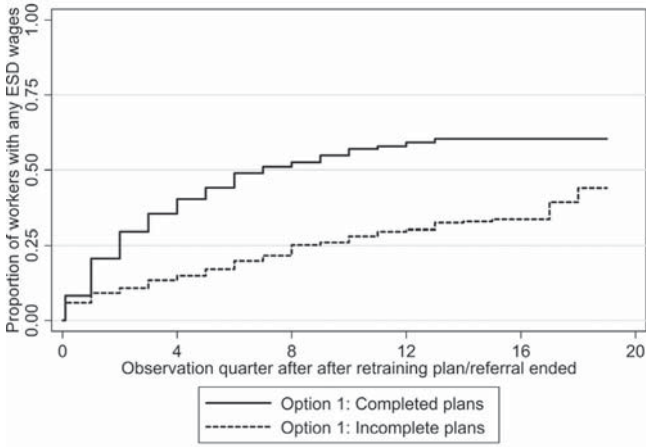

Fig. 5. Proportion of Vocational Improvement Project (VIP) workers who return to work over time, by retraining plan completion. ESD, Washington State Employment Security Department.

4. Discussion

The VIP was intended to reduce delays, reduce repeat referrals, lead to faster development of viable retraining plans, and improve retraining plan completion rates. We found significant reductions in delays at several key points in the process, including significant reductions in inefficient and costly repeat referrals, all plausibly related to the new timelines and accountability features of the VIP. For example, the observed pattern of plan submissions suggests that the VIP's new 90-day submission requirement was the mechanism encouraging timelier plan submissions. In fact, all three repeat referral measures and every time-dependent process measure we assessed were significantly more efficient under the VIP compared with baseline. However, contrary to expectations, the percentage of plans completed did not improve under the VIP. There was no evidence for an association between initial approved plan length and plan completion rates.

OJT plans had very favorable employment outcomes relative to formal retraining (with the exception of mean wages). This is likely due in part to job offers by the training employer once the worker has demonstrated capability for the work. Research suggests that supportive work environments are key to successful RTW (Young, 2010). OJT arrangements may be especially conducive to a successful RTW transition, since both the employer and worker have invested energy into the worker's success. Although one goal of the VIP was to facilitate OJT plans, the percentage of plans involving OJT dropped markedly under the VIP (from 10% at baseline to 3% under the VIP). The shorter plan development timelines in combination with the complexity of identifying appropriate OJT plans may provide a possible explanation. In several qualitative studies in other countries, strict timelines have been associated with increasingly passive vocational service providers, as well as an increased burden on both injured workers and service providers (MacEachen et al., 2013; Stahl, Mussener, & Svensson, 2012). As a result of these findings, L&I is gathering input from vocational rehabilitation counselors and assessing avenues for supporting the development of OJT plans when appropriate.

There were also preliminary indications of benefit related to the WorkSource feature of the pilot. Although the WorkSource pilot locations had a slower than expected roll-out, and consequently there have been relatively few referrals so far, there is preliminary evidence that RTW outcomes for those referred to WorkSource may be better than for those referred to the private sector. In a related survey, workers reported a high degree of satisfaction with services received via WorkSource (Sears & Wickizer, 2012). There may be

favorable effects related to direct exposure to the WorkSource environment and resources, including workshops on resume writing, interviewing techniques and using the computer for job searches. The statistical models controlled for many worker and employment-related factors, but it is not possible to determine whether unmeasured selection bias contributed to these effects (i.e., it is possible that certain workers were referred to WorkSource because it was thought they would particularly benefit from that avenue).

Under the VIP, there was gradual improvement over time in the percent of plans having goal occupations with a high labor market demand rating. However, it does not appear that labor market demand ratings are associated with better employment outcomes. This may in part be due to the long delay between rating assignment and the worker's completion of retraining and labor market re-entry. There was also no evidence that longer plans were associated with better employment outcomes, with the exception that longer plans were associated with significantly higher mean wages. There is likely some benefit to having a wider variety of training options available in order to enable the best fit between plans and workers' needs. However, formal retraining plans may actually confer potential disadvantages to some workers if they were placed into an academic program that was not a good fit for them.

There were no significant differences in average employment outcomes between Option 1 and Option 2, except that Option 2 workers were less likely to RTW immediately (possibly because they had not yet undergone retraining for re-employment, and had just received six months of time-loss compensation). Because plan completion status was considered an outcome, workers were not excluded from the Option 1 group if they did not complete vocational retraining. Thus, employment outcomes for Option 2 workers were compared to those for all workers who chose Option 1, not solely to those who completed retraining (and workers who did not complete Option 1 retraining had poorer employment outcomes than those who did, as shown in Fig. 5). In addition, it was unclear at what point Option 2 employment outcomes could be reasonably compared with those for Option 1 since Option 2 workers are not considered able to work immediately after claim closure and may delay use of their retraining funds for up to five years. Although the statistical models controlled for many worker and employment-related factors, selection bias remained a challenge and an in-depth understanding of the impact of Option 2 on employment outcomes will require further study. In addition to the administrative data analyses described herein, we also collected survey data used in further study of this particular VIP feature (Sears, Wickizer, & Schulman, 2013).[3]

Employment outcomes overall appeared to be worse under the VIP, likely due to a combination of factors that could not be disentangled given the near simultaneous impact of all features of the VIP along with the economic recession. There were also substantial dips in both employment rates and wages for workers involved in other state workforce training programs after 2008 (Workforce Training and Education Coordinating Board, 2012). Option 1 workers who did not complete retraining accounted for most of the poorer RTW outcomes for the VIP relative to baseline; however, we could not identify any specific feature of the VIP that might be responsible. Mediating factors, such as fewer OJT plans or the availability of Option 2, did not account for the entire decrement. However, when the models were restricted only to workers who had completed retraining, there were no significant differences in employment outcomes between the VIP and baseline. Although evidence is lacking, it is possible that workers who completed vocational retraining under the VIP might actually have benefited from some of its features (such as longer retraining plans), but that the recession prevented such benefits from fully materializing into better employment outcomes.

This evaluation had several strengths, perhaps foremost being the ongoing collaboration with L&I and stakeholders. The data related to this major initiative were quite rich and we were able to identify several areas worthy of further investigation. We used a variety of process measures, as well as several different approaches to measuring employment outcomes. However, there were also major challenges to this evaluation. This study was not contracted or designed until the VIP program was well underway. Most VIP-related changes were implemented simultaneously, making it difficult or impossible to separate the effects of various changes. There were methodological challenges related to including Option 2 workers in the employment outcome models. At the point that employment outcomes were measured, baseline workers and VIP Option 1 workers had their chance to finish training and RTW, but most Option 2 workers had not yet started any retraining. The most serious challenge facing this evaluation was the lack of a suitable concurrent comparison group that would enable adequate control for (1) self or system-based selection into various new features of the VIP, and (2) secular trends, including the near-simultaneous impact of the severe economic recession. Ideally, we would have been able to construct a comparison group similar with respect to all important characteristics except for VIP exposure, which would have enabled a natural experiment-based design, but we were unable to identify/obtain the necessary data. Although we have compared the VIP with a baseline period and taken great care to make our samples for each analysis as comparable as possible, we cannot say with certainty whether the differences we observed were due only to the VIP. L&I has implemented process changes and improvements in an ongoing way, not all of which were related to the VIP, which may also have contributed to some of the changes we observed.

The economic recession hit very shortly after the VIP began, which was a major threat to the pre-post design. Although we controlled for unemployment rate in the employment outcome models, that may not have captured the recession's full impact on injured workers. We tried many variations, including squaring the unemployment rate (weighting higher unemployment more heavily), creating various lags, and using other unemployment measures available from the Bureau of Labor Statistics, such as those including part-time or underemployed workers. None resulted in substantially different findings. Difference-in-difference models using workers found "able to work" (workers who did not RTW with the same employer but who did not require retraining) as a non-equivalent comparison group provided some evidence that labor market conditions did have some residual effect on injured workers over and above that of the unemployment rate, but that effect did not substantially mitigate the decrement in employment outcomes observed under the VIP. In summary, we implemented numerous approaches to control for the severe economic recession, but none appeared to strengthen the employment outcome models beyond using the local unemployment rate. It seems unlikely that the economic recession in and of itself was wholly responsible for the decline in employment outcomes observed under the VIP, given the robustness of these findings to all approaches.

5. Conclusions and lessons learned

In summary, we did find evidence that several intended outcomes of the VIP were attained: (1) fewer repeat referrals, (2) faster development of viable retraining plans, (3) increased choice for workers regarding training alternatives, (4) the establishment of partnerships with WorkSource to improve worker outcomes, and (5) workers being retrained for higher demand occupations (although increased prevalence of higher demand goal occupations

[3] A manuscript currently under review describes and compares Option 1 and Option 2 at more length (Sears, Wickizer, & Schulman, unpublished results).

did not seem to improve actual employment outcomes). However, there was no measurable change in the percentage of workers who successfully completed vocational retraining. The percentage of plans involving OJT decreased by two-thirds under the VIP, despite evidence that OJT plans were associated with favorable RTW outcomes. We also found no evidence that the VIP returned more workers to higher wage jobs, except that longer plans were associated with significantly higher mean wages. It was noteworthy that employment outcomes were not worse for the subset of workers who completed retraining under the VIP compared with baseline, even though the VIP was implemented in the midst of a severe economic recession.

Though descriptive in nature, this evaluation provided evidence that there have indeed been a number of improvements in efficiency under the VIP. There remains substantial room for further improvement, particularly in the areas of facilitating OJT plans, making full use of WorkSource resources, and developing better ways to assist workers to RTW more quickly and in employment approaching pre-injury wages. Although the VIP was designed to improve outcomes for injured workers, retraining plan completion rates remain under 60%, and only half of workers with completed plans earn any ESD wages within two years of plan completion. Further investigation into the causes and potential solutions for these issues should receive high priority.

House Bill 1726, enacted in 2011, addressed recommendations of the VIP subcommittee to clarify and improve some minor aspects of the original VIP law. Substitute Senate Bill 5362 was signed into law in 2013 after receiving overwhelming support in both the House and the Senate, and extended all aspects of the VIP (including the VIP subcommittee) through June 30, 2016. This extension will allow time for further study and adjustments, and demonstrates the successful policy impact of this evaluation.

This evaluation touched on many issues that may be of interest to researchers, evaluators, and workers' compensation policymakers nationally. We evaluated a multifaceted piece of legislation that was implemented within a large complex system characterized by competing stakeholder interests. The central lesson was the importance of establishing early and ongoing communication and collaboration with stakeholders, including employers, worker representatives, and vocational rehabilitation professionals. The successes attained during the implementation of the VIP, as well as the successful policy impact of the evaluation, were due in large part to the early establishment of the VIP subcommittee. Although members held differing opinions and perspectives, over time they developed what appeared to be respectful and effective working relationships based on a deep investment in making improvements to the system. Another important lesson was the need to develop multiple measures of the same concept (employment outcomes in this case), which addressed the differing stakeholder priorities and laid the groundwork for more robust findings. Finally, this evaluation involved a very complex and dynamic system, and it was essential to maintain close working relationships with L&I staff who were knowledgeable about the meaning of various data fields, the data generating processes, and agency procedures. These lessons are broadly generalizable to complex evaluations conducted in political or otherwise contentious environments.

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References

Barth, P., Grob, H., Harder, H., Hunt, A., & Silverstein, M. (2008). *Washington Pension System Review, Upjohn Institute Technical Report No. 08-025. Prepared for State of Washington, Department of Labor & Industries, Contract No. K1018*. Retrieved from http://www.upjohninst.org/publications/tr/tr08-025.pdf.

Franche, R. L., Baril, R., Shaw, W., Nicholas, M., & Loisel, P. (2005). Workplace-based return-to-work interventions: Optimizing the role of stakeholders in implementation and research. *Journal of Occupational Rehabilitation, 15*(4), 525–542.

Franklin, G. M., & Fulton-Kehoe, D. (1996). Outcomes research in Washington state workers' compensation. *American Journal of Industrial Medicine, 29*(6), 642–648.

Franklin, G. M., Wickizer, T. M., Fulton-Kehoe, D., & Turner, J. A. (2004). Policy-relevant research: When does it matter? *NeuroRx, 1*(3), 356–362.

KPMG LLP. (2009). *WSIB Labour Market Re-entry (LMR) Program Value For Money Audit Report*. Retrieved from http://www.wsib.on.ca/files/Content/VFMAVFMALMR2009/LMRvfma.pdf.

MacEachen, E., Kosny, A., Ferrier, S., & Chambers, L. (2010). The toxic dose of system problems: Why some injured workers don't return to work as expected. *Journal of Occupational Rehabilitation, 20*(3), 349–366.

MacEachen, E., Kosny, A., Ferrier, S., Lippel, K., Neilson, C., Franche, R. L., et al. (2012). The 'ability' paradigm in vocational rehabilitation: Challenges in an Ontario injured worker retraining program. *Journal of Occupational Rehabilitation, 22*(1), 105–117.

MacEachen, E., Kosny, A., Ferrier, S., Lippel, K., Neilson, C., Franche, R. L., et al. (2013). The ideal of consumer choice: Challenges with implementation in an Ontario injured worker vocational retraining program. *Disability and Rehabilitation* http://dx.doi.org/10.3109/09638288.2013.771704. Online first: April 25, 2013.

McPherson, K. (2007). *Evaluation of Vocational Rehabilitation under the IPRC Act 2001*. Retrieved from http://hazelarmstronglaw.co.nz/beta/wp-content/uploads/2012/07/Evaluation-of-Vocational-Rehabilitation-under-the-IPRC-Act-2001-Kathryn-McPherson.pdf.

Sears, J. M., & Hogg-Johnson, S. (2009). Enhancing the policy impact of evaluation research: A case study of nurse practitioner role expansion in a state workers' compensation system. *Nursing Outlook, 57*(2), 99–106.

Sears, J. M., & Wickizer, T. M. (2012). *Evaluation of the Vocational Rehabilitation Pilot Program. Report to the Washington State Legislature as required by ESSB 5920*. (Chapter 72, Laws of 2007) Retrieved from http://www.lni.wa.gov/ClaimsIns/Files/Vocational/VocPilotProgEval.pdf.

Sears, J. M., Wickizer, T. M., & Schulman, B. A. (2013). Injured workers' assessment of vocational rehabilitation services before and after retraining. *Journal of Occupational Rehabilitation* http://dx.doi.org/10.1007/s10926-013-9479-0. Online first: September 25, 2013.

Stahl, C., Mussener, U., & Svensson, T. (2012). Implementation of standardized time limits in sickness insurance and return-to-work: Experiences of four actors. *Disability and Rehabilitation, 34*(16), 1404–1411.

State of Washington. RCW Title 51: Chapter 51.12. Employments and occupations covered. Retrieved from http://apps.leg.wa.gov/rcw/default.aspx?Cite=51.12

Tanabe, R. P. (2012). *Workers' compensation laws as of January 2012. WC-12-18*. Cambridge, MA: Workers Compensation Research Institute.

Washington State Department of Labor and Industries. (2012a). *Vocational Improvement Project Report to the Legislature: As required by RCW 51.32.099*.

Washington State Department of Labor and Industries. (2012b). *Workers' compensation benefits: A guide for injured workers. Publication F242-104-000 [03-2012]*. Retrieved from http://www.lni.wa.gov/IPUB/242-104-000.pdf.

Washington State Employment Security Department. (2012, July). *Quarterly Census of Employment and Wages, Fourth Quarter 2011 Preliminary. LM-12-0263*.

Workforce Training and Education Coordinating Board. (2012). *Program Employment and Earning Results, 2004–2012*. Retrieved from http://www.wtb.wa.gov/SystemwideWTR2011.asp.

Young, A. E. (2010). Return to work following disabling occupational injury – Facilitators of employment continuation. *Scandinavian Journal of Work, Environment & Health, 36*(6), 473–483.

Young, A. E., Wasiak, R., Roessler, R. T., McPherson, K. M., Anema, J. R., & van Poppel, M. N. (2005). Return-to-work outcomes following work disability: Stakeholder motivations, interests and concerns. *Journal of Occupational Rehabilitation, 15*(4), 543–556.

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