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Pacific Mountain Workforce Development Council – Opioid Disaster Relief Grant Net Impact Evaluation Report

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Opioid Disaster Relief Grant Net Impact Evaluation Report

Executive Summary

Washington state funds some government reemployment services, and some other support services, with the Dislocated Workers Grant (DWG) and the Opioid Disaster Relief Grant (Opioid grant). Recipients of the latter funds receive more services and are eligible for some additional services specifically oriented towards improving public health. DWG and Opioid grant-funded programs are called "DWG program" and "Opioid program" for brevity in the remainder of this paper. We study the effect of the *additional* services provided via the Opioid program for job seekers from third quarter 2019 through second quarter 2021 in Washington state's Pacific Mountain Region. We find that the *additional* services provided through the Opioid program increased participants' earnings by roughly $3,050. Additional research is required to understand whether the lifetime benefits of these additional services offset the costs of providing them, though preliminary results suggest they will.

Introduction

Opioid abuse may lead to dependence, addiction, overdose incidents and even death. In 2019, 49,860 overdose deaths in the United States were attributable to opioid abuse (CDC, 2021). The Society of Actuaries estimates that the opioid crisis had an economic toll on the country of at least $631 billion from 2015 to 2018 (AJMC, 2020).

Opioid abuse affects the user, their family, and their community in many ways. Abusers suffer health care costs, risk of mortality, and lost productivity in the labor force. If they are students, their grades may suffer. If they are parents, their children may be adversely affected. They may face criminal charges, which could have rippling ramifications for their families.

From an employer's perspective, opioid abuse often disqualifies job applicants. If an employee becomes addicted, they may become less productive and lose their job (Segel et al. 2019). Opioid users face a higher unemployment rate (Badel and Greaney 2013, Azagba et al. 2021). Opioid users, less able to secure a job, are caught in a cycle of addiction and poverty. In extreme cases, this cycle leads to homelessness. In some circumstances, it leads to an increased crime rate (MacCoun et al. 2003).

In October 2017, the federal government declared the opioid crisis a "national health emergency." After the declaration, the Employment and Training Administration (ETA) of the Department of Labor (DOL) made financial investments to assist those impacted by the emergency. These investments rolled out in two phases.

1. Phase one – A national health emergency demonstration grant project was announced in March 2018. They awarded funding for public health and employment services to six states in July 2018.
2. Phase two – In ongoing efforts, they are providing national Dislocated Worker Grant disaster grants (Disaster Recovery DWGs) to 18 states and tribal organizations impacted by this crisis.

The Opioid program that we study in this net impact evaluation is a type of Disaster Recovery DWG.

Nationwide, local government bodies use these funds to provide reemployment and health care services to those in recovery from opioid abuse. In Washington state, the Pacific Mountain Workforce Development Council (WDC) is the local government body that administers reemployment and career services funded by the Opioid grant to individuals impacted by the epidemic. They have delivered these services since February 2019. The Pacific Mountain area has an above-average opioid user rate. With just 7 percent of the state's population, it has 11 percent of the state's opioid users.

The key characteristics of the Opioid program that the Pacific Mountain WDC administers include:

1. In cooperation with local business, providing temporary work experiences and wages in the warehousing industry;
2. In partnership with local health clinics, giving social and health care references to high-risk and high-need participants;
3. Job-search services provided by trained peer navigators who have experienced opioid addiction themselves; and
4. Referrals to services given to those at risk of homelessness.

The services provide job-search skills, work experience, training, and financial support. All the people we study either recently lost a job, claimed unemployment benefits or are underemployed.[1] All receive some reemployment assistance. The Opioid program participants receive similar, but slightly augmented, services compared to the DWG program participants.

We compare the effects of the augmented services funded by the Opioid grant to those funded by the DWG. We find that:

1. Opioid program participants face worse economic conditions before the program.
2. Opioid program participants receive more services. On average, Opioid program participants receive four more career services than their peers in the DWG program. The average Opioid program participant receives services for about seven months.
3. These additional services help Opioid program participants earn higher incomes. They earn roughly $3,050 more because of the augmented services. During these seven months, benefits tend to accrue to Opioid program participants while receiving services, and increased earnings are due to more hours worked.
4. Additional analysis is required to study the long-run net impact and cost effectiveness of these additional, augmented services.

[1] Underemployed workers are those who are employed less than full time but seek full-time employment, employed in a position that is inadequate with respect to their skills and training, employed and meet the definition of a low-income individual, or employed but current job earnings are not sufficient compared to job earnings from their previous employment. (WIOA Self-Sufficiency Definition for Enrollment of Employed Applicants, Pacific Mountain WDC 2016, https://pacmtn.org/wp-content/uploads/2018/02/5020-Self-Sufficiency-2.pdf)

Background

Dislocated Worker Grants provide funding for employment-related services, and are targeted to dislocated workers, as discussed in Section 170 of the Workforce Innovation and Opportunity Act (WIOA). There are two types of DWGs: Disaster Recovery and Employment Recovery. Disaster Recovery DWGs (including the Opioid grant) create temporary employment opportunities to assist with recovery efforts for a declared emergency or major disaster. Employment Recovery DWG programs (i.e., standard or basic DWG in this report) temporarily expands government capacity to serve dislocated workers and to meet the labor demand after qualifying events. These events are major economic dislocations, such as plant closures, mass layoffs, or higher-than-average labor demand. Job seekers are considered on a case-by-case basis to determine whether they should receive DWG-funded services.

The Opioid program can be thought of as an augmented version of the DWG that helps communities respond to the opioid crisis. It is targeted to people affected by the opioid epidemic with the goal of improving employment outcomes in the short run and improve public health in the long run. In addition to reemployment services, the program offers temporary employment opportunities. The Opioid program may also fund training initiatives for individuals transitioning into health care professions related to the epidemic, like mental health services, addiction treatment, and pain management treatment.

Eligibility

There are workforce and epidemic-related eligibility criteria. Individuals eligible to receive services through a Disaster Recovery DWG are one of the following:

1. A dislocated worker;
2. An individual temporarily or permanently laid off as a consequence of the disaster or emergency;
3. A long-term unemployed individual; or
4. A self-employed individual who became unemployed or significantly underemployed as a result of the emergency or disaster.

In addition, there are two different epidemic-related eligibility criteria that can qualify a participant for the Opioid program.

Option A: Workers that are directly or indirectly affected by the opioid crisis. This requires the workers to have one of the following characteristics:

- The individual, a friend, or any member of their family has a history of opioid use,
- The individual works or resides in a community affected by the opioid crisis,[2] or

[2] A community affected by the opioid crisis is at the minimum an area that shows an increase equal to or greater than the national increase in such problems between 1999 and the latest year for which data are available. Possible sources may include (among others): a. the incidence or prevalence of opioid misuse and other substance use disorders; b. the age-adjusted rate of drug overdose deaths, as determined by the Director of the Centers for Disease Control and Prevention; c. the rate of non-fatal hospitalizations related to opioid misuse or other substance use disorders; or d. the number of arrests or convictions, or a relevant law enforcement statistic that reasonably shows an increase in opioid misuse or another substance use disorder. (Support to Communities: Fostering Opioid Recovery Through Workforce Development, USDOL ETA 2020, https://apply07.grants.gov/apply/opportunities/instructions/PKG00256286-instructions.pdf#page=27)

- The individual can demonstrate job loss as a result of the opioid crisis.

Option B: Workers who seek to enter professions that could help in addressing the opioid crisis and its causes. Workers who seek to transition to professions that support individuals struggling with opioid addiction and/or could impact its underlying causes, and who need new or upgraded skills to better serve this population. These individuals are eligible for reskilling or upskilling training activities only in the following professional areas:

- Addiction and substance abuse treatment and related services;
- Pain therapy and pain management services that could reduce or prevent dependence on prescription painkillers; and
- Mental health care treatment services for disorders and issues that could lead to, or exacerbate, opioid abuse and addiction.

Services

Program participants may receive one or more of the following services and may receive a particular service more than once.

Basic WIOA services:

- Basic assessment: Assessment of a participant's skills, education, or career objectives in order to achieve any of the following:
  - Assist the participant in deciding on appropriate next steps, search for employment, training and related services, including job referral;
  - Assist participant in assessing his/her personal barriers to employment;
  - Assist participant in assessing other related services necessary to enhance his/her employability and individual employment-related needs.
- Career guidance: Assist participants in planning career or vocational paths, preparing for the job market, and identifying or creating steps that lead to employment. Expected outcome is to help participants identify, define and verbalize their career goals, overcome obstacles, and articulate skills and accomplishments.
- Resume review: Desk-side review of an existing resume created by the participant through attendance of the group resume workshop or through the participant's own means. This review can include assistance with targeting a resume, providing spelling, grammar changes and layout suggestions. A desk-side review should not be used to create a resume for the participant.
- Hiring event: Also known as job fair, career expo, career fair or recruiting event – is an event typically held by employers, schools, or recruiters that offer on-the-spot interviews to interested candidates.

Individualized WIOA services:

- Development of individual employment plans: Joint development of an individual employment plan between the participant and case manager to identify employment goals, appropriate achievement objectives, and an appropriate combination of services for the participant to achieve the employment goals, including eligible providers of training services and career pathways to attain career objectives.
- Internship or work experience (WEX)
    - An internship or work experience is a planned, structured learning experience that takes place in a workplace for a limited period of time and is linked to a career.
    - Internships or other work experience may be paid or unpaid, as appropriate and consistent with other laws, such as the Fair Labor Standards Act.
    - An internship or other work experience may be arranged within the private for-profit sector, the non-profit sector, or the public sector.

Training WIOA services:

- Occupational skills training
    - An organized program of study for workers that provides specific vocational skills that lead to proficiency in performing actual tasks and technical functions required by certain occupational fields at entry, intermediate or advanced levels.
    - Eligible participants are those who are unlikely or unable to obtain or retain employment that leads to economic self-sufficiency after an interview, evaluation or assessment, and career planning only, and they are unable to obtain grant assistance from other sources to pay the costs of such training.
    - The project will use local and national best practices to provide these services utilizing peer recovery navigators, work experience opportunities, and offer cohort trainings in high demand regional-employment sectors.
- On-the-job training
    - Training provided by an employer to a paid participant while engaged in productive work in a job that improves knowledge or skills essential to the full and adequate performance of the job.
    - Training that provides reimbursement to the employer of up to 75 percent of the participant's wage rate for extraordinary costs of providing training, and additional supervision related to the training.
    - Training that is limited in duration, considering the content of the training, the prior work experience of the participant, and the service strategy of the participants.

Support WIOA services:

- Program support services

  The purpose of support services is to offer a resource for participants who are actively engaged in job search, work activities or training. Support services should be provided based on the real and immediate needs of the participant.

  - Program support service – transportation
    - Support services are provided to participants prior to job placement and exiting the program. Transportation support are goods in the form of transportation assistance.
  - Program support service – other
    - This service is used when the support services being provided does not fall into the transportation category. This may include assistance with clothing, counseling, family/health care, housing, tools, books, fees, school supplies, union dues, driver's licenses, car repairs, and payments for employment or training-related applications, tests, and certifications.

Follow-up services:

Follow-up services are retention services and helps particpants sustain their employment. Follow-up service appointments include:

- Reviewing and building upon the reemployment action plan created during the initial appointment;
- Reviewing participant unemployment benefits eligibility;
- Providing labor market information specific to their current needs; and
- Appropriate career services determined necessary to result in reemployment or referrals to career-related training.

Literature review

Unemployment and opioid addiction are two reinforcing facets that may lead the afflicted person to a worsening situation: unemployed people are more likely to become addicted to opioids, and opioid abusers are more likely to become unemployed. Helping opioid-affected people find and keep a job may be an effective way to reduce opioid addiction rates.

Public health researchers and labor economists have studied the effects of different policies that aim to help opioid users overcome substance dependency and become employed. These interventions include individual placement and support, customized employment support, contingency management, financial incentives, job seekers' workshops, and recovery housing. Similar types of services are funded by the Opioid Disaster Relief Grant.

Systematic reviews of interventions intended to improve employment outcomes for people with opioid use disorder were published recently (see Magura and Marshall 2020; Vine et al. 2020). These reviews find that employment can result in better treatment and health care outcomes. At the same time, opioid treatment can also help improve work behavior including attendance and competency at work.

Individual placement and support (IPS) integrates clinical and employment services and can continue after the recipient finds a job. IPS was originally provided to assist people with mental illnesses and has recently been applied to help opioid users. Lones et al. (2017) study the effects of an IPS program using a randomized controlled trial (RCT). The RCT was conducted between December 2014 and June 2015 in Portland, Oregon, and the follow-up data collection lasted 12 months. Treatment group members received IPS services immediately, and control group members were waitlisted for six months. All participants received standard opioid treatment program care including daily methadone dosing, weekly random urine drug-screen testing, at least one weekly group session, and monthly individual counseling sessions. IPS is a model with more components:

- Eligibility based on consumer choice;
- Focus on competitive employment;
- Integration of mental health and employment services;
- Attention to patient preferences;
- Work incentives planning;
- Rapid job search;
- Systematic job development; and
- Individualized job supports.

The results show that IPS recipients with opioid-use disorders are more likely to obtain employment, though the sample size is relatively small.

The customized employment support (CES) model is an innovative vocational rehabilitation model for people receiving methadone to treat their opioid dependency. CES addresses both the vocational and non-vocational barriers to attain rapid job placement. Magura et al. (2007) examined the effects of CES using a randomized controlled trial where the treatment group was assigned to CES services and the control group was assigned to standard vocational counseling. The standard counselors' caseloads were twice as large as the CES counselors' caseloads, since CES takes more time to administer than standard services. At 6- and 12-month follow-ups, treatment group members were more likely to be employed.

Contingency management is the mode of service delivery where participants receive benefits only if they meet certain requirements on a regular basis. One example is the "therapeutic workplace" studied by Aklin et al. (2014). At the time of enrollment into the study, participants were receiving care at a center for pregnant women struggling with addiction. Alkin et al. (2014) randomly assigned some interested women into a treatment group that received training while establishing abstinence, then entered employment with a pre-identified employer. This employment was conditional on the participants providing regular objective evidence of their continued abstinence. Women in the control group received standard care. Three to four years later, the study participants that received the contingent job opportunities had significantly better employment outcomes. Five to eight years later, the individuals who received normal services had caught up to those who received augmented services. Overall, the impact of the augmented services was positive.

Financial incentives that are contingent on the recipient being healthy can also lead to improved health outcomes and to employment for low-income people with substance use disorders. One reason is that immediate consequences (e.g., financial incentives) have more influence on behavior (e.g., participating in programs) than delayed consequences (e.g., employment and health outcomes). Holtyn et al. (2020) provided financial incentives for working with the employment specialist to the incentive group while providing no incentives to the control group. The employment specialist worked with participants for one year to assist them in obtaining community jobs. One year later, program participants who received financial incentives were more likely than the control group to be employed and retained in the jobs.

Job seekers' workshops (JSWs) are a relatively less time- and resource-intensive intervention. These workshops include the presentation of information about vocational resources and opportunities available to drug users and provide interview practice and advice on completing application forms. Svikis et al. (2012) used a randomized controlled trial to study such workshops. In their evaluation, the treatment group received information about local employment resources and participated in a small group JSW. The control group only received information about local resources. Though the measured treatment effect was positive, the study was underpowered, and the authors couldn't reject the null hypothesis that the program had no effect. It's possible that, with a larger sample size, they would have detected a positive effect of JSW services.

There are also studies on the net impact of recovery housing. Although it is not directly employment focused, recovery housing might lead to improved employment outcomes. Tuten et al. (2017) examined the efficacy of reinforcement-based treatment (*RBT*) plus recovery housing (which they call RBT^{RH}). RBT is a psychosocial intervention with contingency management, while recovery housing is a communal supervised living environment. The goal of the recovery housing is to reduce potential exposure to drug-use-related stimuli in an individual's home and surrounding environment. Tuten et al. studied longitudinal data of individuals (non-randomly) assigned to either a treatment group with RBT^{RH} or a control group with *RBT* only. The results show no difference in employment outcomes between the two groups, but a sensitivity analysis shows that treatment group members who paid for the recovery housing themselves – compared to those with program-supported recovery housing – have better employment outcomes.

These services provided to opioid-impacted populations in these studies effectively aid in their effort to find a job and are similar to the services that the Pacific Mountain WDC provides. As such, we may expect that services funded by the Opioid grant have similarly positive effects. We aim to study the effects of this grant, relative to the effects of the services funded by the DWG. This type of comparison is also similar to the ones we reviewed above, and similar to those found in other studies that examine augmented versus basic services.

Summary statistics

In this section, we provide descriptive statistics for the participants of the Opioid Disaster Relief Grant program and the DWG program. We study people who are job seekers in our system between July 1, 2019 and August 31, 2021. We study their employment outcomes through August 9, 2021. We only consider those who have completed their respective programs by August 9, 2021.

We study 471 participants in total, with 383 in the DWG program only, 48 in the Opioid program only, and 40 in both programs. We consider the 40 people that receive funding from both sources to be Opioid program participants. We track person-quarter observations from five quarters before to five quarters after the program start date.[3]

Everyone in the study either lost their job or was underemployed in the last three years. They received reemployment services funded by one of the two grants. As such, the general pattern that we observe for study participants is an initial loss of income and employment, followed by a period of job search and then, in most cases, reemployment.

Before loss of employment, Opioid program participants are more likely to be male, low-income and less educated

We report participants' demographic characteristics in *Figure 1*. The first column displays the characteristics. In the second, we provide the corresponding information for the DWG group. In the third, we provide the information for the Opioid group. In the fourth, we report a t-statistic. This statistic, when larger than 1.96, indicates when the two groups are statistically different from each other at the 95 percent confidence level. The fifth column reports the sample size.

The Opioid program had more male participants. Roughly half of the DWG program participants were male, while about 80 percent of the Opioid program participants were male. In addition, the Opioid program participants had slightly less education than the DWG program participants. A much larger portion of the Opioid program participants had been involved with the justice system, and a greater portion of the Opioid program participants lived in a low-income household.[4] Opioid program participants were more likely to experience homelessness prior to their program participation.

The demographic characteristics show that Opioid program participants face relatively high barriers to reemployment compared to DWG program participants. They have lower rates of educational attainment, worse career opportunities, and higher rates of justice involvement.

[3] We construct a longitudinal dataset for this analysis. In this data, each column is a variable, and each row provides information about a person in a specific calendar quarter. Overall, there are 4,690 observations in this longitudinal data, with 3,843 person-quarters from the DWG and 847 from the Opioid program. On average, DWG participants are observed for 10.0 quarters and Opioid program participants are observed for 9.6 quarters.

[4] "Low-income household" is defined at WIOA Section 3(36) as one that qualifies under various criteria, including an individual in a family with total family income for a six-month period that does not exceed the higher level of the poverty line or 70 percent of the Lower Living Standard Income Level (LLSIL). (Workforce Innovation and Opportunity Act (WIOA) 2017; Lower Living Standard Income Level (LLSIL), USDOL ETA 2017, https://www.federalregister.gov/documents/2017/05/23/2017-10496/workforce-innovation-and-opportunity-act-wioa-2017-lower-living-standard-income-level-llsil). "Low-income household" in this study is a self-reported field that is not validated by ESD staff.

Figure 1. Demographic characteristics of the DWG program and Opioid program participants
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division

Variable	DWG program participants	Opioid program participants	t-test	N
Age	45.49	43.35	1.52	471
Female	47.7%	20.7%	***5.32	460
White	71.9%	74.0%	0.38	408
Black	4.5%	7.8%	0.99	408
Asian	12.4%	6.5%	†1.75	408
Other race	7.6%	11.2%	0.13	408
Hispanic	7.1%	8.4%	0.12	370
No formal education	1.3%	0.0%	*2.25	467
High school graduate	35.3%	56.3%	***3.58	467
Some college	24.2%	16.1%	†1.79	467
Bachelor	14.7%	5.7%	**2.90	467
Graduate	4.7%	1.1%	*2.26	467
School years	13.33	12.61	**2.96	467
Executive career	8.4%	2.4%	**2.63	426
Offender	3.0%	0.0%	*2.26	211
Low income	7.1%	31.7%	***4.58	418
Receiving assistance	52.0%	69.6%	*2.51	281
Homelessness	33.3%	58.9%	***3.49	281

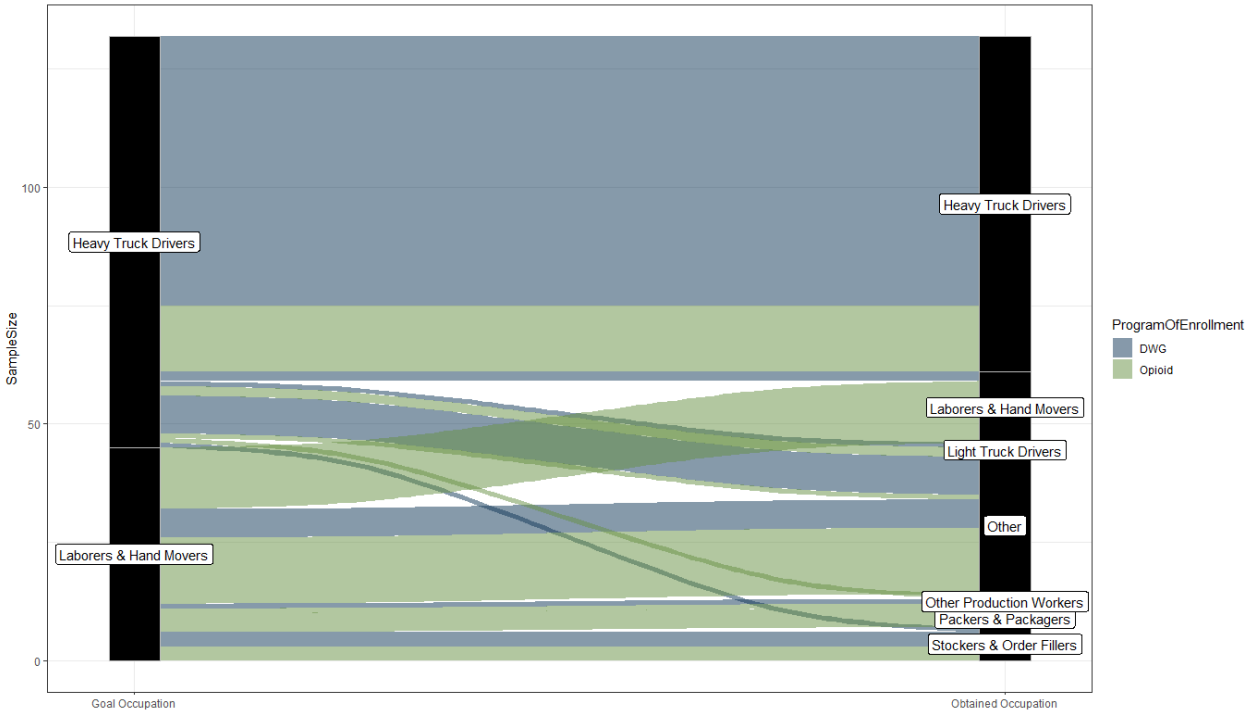
Notes: †p ≤ 0.10, *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001; N = sample size.

Opioid program participants tend to work in occupations that required entry-level skills

Program participants tell service providers their career goals. We show the occupations they report wanting in the first (left-hand) categorical axis of *Figure 2*, and the occupations they attain in the second (right-hand) axis. We report only the top two desired occupations: heavy truck drivers and laborers and hand movers. We also show that 113 people wanted to be heavy truck drivers and 72 people wanted to be laborers. Heavy truck drivers operate a tractor-trailer combination or a heavy truck which requires a commercial drivers' license (CDL). Laborers and hand movers manually move freight, stock, luggage, or other materials, or perform general labor. Heavy truck drivers are more skilled in terms of the license they require. The ratio of DWG and Opioid program participants who set each of these two occupations as a goal, and who attain their goal, are similar. There are disproportionately more Opioid program participants whose attained occupation is associated with manual labor.

One reason for heavy truck drivers to be the top desired occupation is that the Opioid program offered trainings for certified logistics associate. Laborer is set as a goal occupation because individuals who have significant barriers to employment, will often state career goals in their assessments that are perceived as "attainable." The alluvial plot also shows that none of the workers who obtained heavy truck drivers as their occupation had a goal to be a laborer and hand mover.

Figure 2. Occupations as the goal and at completion for DWG program and Opioid program participants
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA



Industry placement increases in warehousing and health care sectors

We report the industry that the job seeker works in after program participation in *Figure 3*. Column one gives the industrial sectors. Column two provides the probability of DWG program participants getting employed in different sectors after the program, and column three provides that of the Opioid program. Column four shows the difference in probability of getting employed in different sectors before and after receiving opioid services.

Within the subset of sectors with an increasing probability of employment after the Opioid program, some sectors (e.g., retail, real estate, warehousing and administrative services) hire a larger proportion of Opioid program participants. The higher proportion of Opioid program participants in the warehousing sector reflects the design of the Opioid program, since the local program providers cooperate with warehousing industry employers to provide jobs to participants. Employment in the sector of health care and social assistance is also on the rise among Opioid program participants, although there is a larger proportion of DWG program participants in this sector after the program.

Figure 3. The percentage of participants in different sectors after the DWG program and Opioid program, and changes before and after participating in and receiving services from the Opioid grant-funded program
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division

Industrial sector	Percent of employment after the DWG program	Percent of employment after the Opioid program	Percent difference of employment before and after receiving Opioid program services
Retail trade	11.1%	20.9%	6.8%
Real estate and rental and leasing	2.2%	4.5%	3.8%
Health care and social assistance	14.1%	9.0%	3.6%
Couriers and warehousing	1.6%	3.0%	1.0%
Administrative and support and waste management and remediation services	10.9%	28.4%	0.2%
Manufacturing	9.2%	7.5%	0.1%
Mining, quarrying, and oil and gas extraction	0.5%	0.0%	0.0%
Management of companies and enterprises	0.3%	0.0%	0.0%
Other services (except public administration)	3.5%	3.0%	-0.4%
Professional, scientific and technical services	3.5%	1.5%	-0.5%
Public administration (not covered in economic census)	9.2%	1.5%	-0.5%
Information	1.1%	0.0%	-0.7%
Wholesale trade	6.3%	3.0%	-1.0%
Finance and insurance	1.4%	1.5%	-1.2%
Agriculture, forestry, fishing and hunting (not covered in economic census)	7.1%	7.5%	-1.3%
Educational services	3.5%	0.0%	-1.3%
Accommodation and food services	4.3%	6.0%	-1.4%
Construction	2.2%	1.5%	-1.9%
Transportation	6.3%	1.5%	-2.5%
Arts, entertainment and recreation	1.6%	0.0%	-2.7%
N	368	67	N/A

Notes: N = sample size. The sample size for column four depends on the number of Opioid program participants before receiving the services (149) and that after receiving the services (67).

Opioid program participants receive more services

The DWG and Opioid programs connect participants with WIOA services, including basic services and individualized training and support (ITS) services. In *Figure 4,* column one, we report the services in the two categories. Column two and column three shows the average number of services per person from the DWG and Opioid grant-funded programs. In column four, we report a t-statistic. Column five lists the sample size.

Panel A shows the basic services received by program participants, ordered by number of receivers from high to low. The top five basic services include a basic job search assessment, self-service (to search jobs, to apply for jobs and to save jobs), and career guidance services. Similarly, in Panel B, the top five ITS services are development of individual employment plans, program support services (transportation and other), occupational skills training, and work/internship experience.

Opioid program participants receive almost the same basic services as DWG program participants, only exceeding them in receipt of career guidance services (2.0). These services assist with career planning, job market preparation, and employment paths identification. However, Opioid program participants receive more ITS services in almost all categories. On average, Opioid program participants receive four more ITS services per person than DWG program participants.

The primary way that the Opioid grant-funded program can be considered an augmented version of the DWG-funded program is in the provision of these additional ITS services. In our empirical analysis, we study what the impact of these extra ITS services are on program participants' career outcomes.

Figure 4. WIOA services provided to DWG and Opioid program participants
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division

Service	DWG	Opioid	t-test	N
Panel A: Basic services	9.74	11.29	0.88	4,364
Basic assessment (2.0)	5.07	5.61	1.02	2,158
Self-service search jobs	4.62	9.50	1.17	527
Self-service apply for job	9.09	6.31	0.70	473
Self-service save jobs	6.5	2.11	*2.57	227
Career guidance services (2.0)	1.51	4.07	***5.67	169
Miscellaneous workshop	4.38	2.33	†1.91	154
Career guidance services (3.0)	1.71	1.78	0.22	119
Employment referral (2.0)	1.81	2.00	0.94	93
Deskside job seeker assistance (2.0)	1.51	1.46	0.15	72
Self-service view occupations	3.67	2.00	0.99	70
Self-service create or upload resume	1.56	1.25	0.80	35
Self-service update resume	1.29	1.33	0.13	22
Self-service save searches	1.60	4.00	1.18	16
Resume review	1.38	1.00	†2.05	13
Meaningful unemployment assistance	1.13	1.00	1.00	11
Deskside job seeker assistance (3.0)	1.40	1.00	1.00	9
Panel B: Individualized training and support services	3.05	6.59	***8.77	1,758
Development of individual employment plans (2.0)	1.49	2.33	***10.96	771
Program support services (Other)	1.98	2.83	*2.62	433
Occupational skills training (2.0)	1.25	1.88	***7.72	260
Program support services (transportation)	2.49	2.32	0.40	181
Work/Internship experience	1.36	1.50	0.61	46

Notes: †p ≤ 0.10, *p ≤ 0.05m, ***p ≤ 0.001; N = sample size.

Opioid program participants earn lower incomes before the program

Figure 5 reports participants' employment information for both DWG and Opioid programs in the five quarters before the program started. Column one lists employment indicators, including the employment rate, average hourly wages, average quarterly wages, and average quarterly working hours. Column two through five contain information for DWG program participants, information for the Opioid program participants, t-test statistics showing when the two groups are statistically different, and the sample size, respectively.

Opioid program participants had lower average hourly wages and lower average quarterly earnings prior to receiving services. The quarterly working hours are also marginally lower for Opioid program participants. The only qualitatively comparable indicator is the employment rate, which has no statistical difference between the two groups.

Figure 5. Average employment statistics for DWG and Opioid program participants before the program
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division

Employment indicators	DWG	Opioid	t-test	N
Employment rate	67.8%	65.8%	0.43	481
Average hourly wages	18.96	16.86	**3.01	387
Average quarterly wages	7,754.88	6,100.80	**3.27	387
Average quarterly working	398.06	354.92	†1.79	387

Notes: †p ≤ 0.10, **p ≤ 0.01; N = sample size.

Opioid program participants claim less in unemployment benefits

Panel A of *Figure 6* provides statistics on unemployment benefits indicators, including probability of exhaustion, claimed weeks and claimed unemployment benefits amount. Panel B compares program outcome indicators, including time to employment, probability of self-employment, probability of unsubsidized employment and probability of employment related to completed training. Panel C shows the intermediate outcome indicator, which is the probability of participants earning credentials in a training program. This figure shows the correlation instead of the causation between indicators and the program they participate in.

The claim history and program outcome datasets show that the Opioid program participants have lower probability of exhausting their unemployment benefits (that is, claiming all that they are entitled to), claim fewer weeks, and claim a smaller amount of unemployment benefits. They also become reemployed more quickly.

Some job seekers took training as part of their reemployment process. The Opioid program participants were more likely to pursue training. Afterwards, they are more likely to find a job related to the training they pursued.

Some participants have experienced homelessness (DWG: 29, Opioid: 21).

Figure 6. Unemployment outcomes and program outcomes for DWG program and Opioid program participants
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division

Outcomes	DWG	Opioid	t-test	N
Panel A: Unemployment benefits indicators				
Probability of exhaustion	54.1%	37.3%	*2.57	422
Weeks claimed	17.61	13.93	**2.65	422
Amount claimed	7,937.83	5,215.06	***4.08	422
Panel B: Program outcome indicators				
Time to employment	132.74	98.49	**2.78	336
Self-employment	6.7%	1.2%	**2.78	336
Unsubsidized employment	96.8%	97.6%	0.37	336
Employment related to completed training	33.2%	50.0%	**2.67	335
Panel C: Intermediate outcome indicators				
Credential Earned	24.7%	53.1%	***6.11	621

Notes: *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001; N = sample size.

Empirical results

We make our estimates using the difference-in-differences model and this data. This model controls for the initial differences between the Opioid program and DWG program participants using a method called "fixed effects." See the *Technical appendix* for a more complete discussion on how fixed effects modeling allows us to estimate the causal net impact of the additional services provided to the Opioid program participants.

The way to interpret the results in this section is different from the way to interpret those presented in the Summary statistics section. In this section, we are describing the changes in job seekers' experiences caused by their participation in the Opioid program instead of the DWG program.

We present our estimates of the Opioid program's net impact on participants' employment outcomes in *Figure 7*. We report the results from the difference-in-differences model. The key estimates of interest in this regression are the interaction terms, also called the "difference-in-differences estimates," which show the effects of Opioid program compared to DWG program at different periods.

The Opioid program increased participants' earnings (compared to the hypothetical case where they received the DWG program services instead)

The *additional* services provided to the Opioid program participants increased their earnings by roughly $3,050 during the study period. On average, participants received services for 2.25 calendar quarters via the Opioid program. In each quarter during the program, the services increased participants' earnings by $1,355. The additional services do not have a statistically significant effect on earnings after job seekers exit the program. It is possible that future analysis, with a larger sample size and a longer time horizon, would detect a statistically significant, positive effect after the program ended.

Opioid program participants work more hours quarterly than DWG program participants

The Opioid program has a significant net impact on working hours during and after the program. It increases working hours by 52 hours (or 1.3 weeks) in the former period, and by 47 hours (or 1.2 weeks) in the latter period.

The additional services provided by the Opioid program did not increase the likelihood of employment

While Opioid program participants participate in the program, they are as likely as their control group counterparts to be employed. After the program finishes, Opioid program participants still have similar probability of employment as the control group. The Opioid program participants have a slightly higher probability, which is not statistically significant, than their peers to work during and after the program.

The Opioid program did not have an effect on hourly wages

The effect of Opioid program on hourly wages is not statistically significant. Hourly wage change is not the source of total earnings change in this case.

The difference-in-differences regression shows that the extensive margin of work (the percentage of employment) in our sample is unchanged, but the intensive margin of work (working hours for these people) increases during and after the Opioid program. And the increase in total quarterly earnings is mainly due to the increase in working hours instead of the hourly wage.

Figure 7. Regression results for employment outcomes of DWG program and Opioid program participants
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division

	Dependent variables			
FE DID models	**Total quarterly wages**	**Quarterly working hours**	**Employment**	**Hourly Wages**
During program	***-2,761.04	***-120.03	***-0.09	***-1.27
Standard error	(325.62)	(15.55)	(0.03)	(0.33)
After program	624.76	†37.37	*0.07	-0.64
Standard error	(440.76)	(21.05)	(0.04)	(0.45)
During program × Opioid program dummy	*1,354.67	*52.28	0.05	0.21
Standard error	(538.09)	(25.70)	(0.04)	(0.55)
After program × Opioid program dummy	412.97	†47.06	0.002	-0.48
Standard error	(566.95)	(27.08)	(0.04)	(0.58)
Unemployment rate	†-349.13	-15.83	-0.02	0.03
Standard error	(207.01)	(9.89)	(0.02)	(0.21)
N	2,407	2,407	4,350	2,407
Residual standard error	3,367.34 (df = 1,994)	160.84 (df = 1,994)	0.40 (df = 3,902)	3.43 (df = 1,994)

Notes: †p ≤ 0.10, *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001; Standard error statistics are in parentheses; N = sample size.

Cost-benefit analysis

The total costs for DWG program are $1,351,813 for the period of April 1, 2019 to June 30, 2021 and that for the Opioid program is $715,500 for the period of January 1, 2019 to August 31, 2021. Our strategy has two steps. First, we calculate the per-person, per-quarter costs for both programs, and compare these costs to get the relative per-person per-quarter costs of administering the Opioid program. To calculate the per-person per-quarter costs, we study all quarters within the budgeting periods for each program. Then, we compare the relative cost with the total quarterly earnings difference from the difference-in-differences model. This is the relative benefit of receiving the additional Opioid program services, measured in labor market returns.

Figure 8. Costs of DWG program and Opioid program
Washington state, April 1, 2019 through June 30, 2021 and January 1, 2019 through August 31, 2021
Source: Employment Security Department/DATA Division; Pacific Mountain WDC

Costs	PY 2019 and FY 2020 DWG	Opioid program
Total costs	$1,351,813.00	$715,500.00
Total person quarter	703.09	179.14
Total per person quarter costs	$1,922.67	$3,994.08

The Opioid program costs $2,071.41 (= 3,994.08 – 1,922.67) more than DWG program per person, per quarter while the Opioid program increases benefits by $1354.67.[5] during the program. At first, it seems that the Opioid program is not as cost effective as DWG. However, it may be the case that benefits continue to accrue over time to the Opioid program participants, and a study with a longer time horizon would accurately measure a positive program effect. For future study, with a bigger sample size and more time, it is likely to detect an effect in the after-program period. In addition, if we consider the spillover effects on families, neighborhoods and communities, the program's overall effectiveness may be positive.

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[5] The total earnings increase during the Opioid program and after the Opioid program is not significantly different from 0. The 10 percent confidence interval from block bootstrapping is (-360.37, 3001.15).

Appendix 1.

Technical appendix

The Opioid program is similar to, but more intensive than, the DWG program. In both programs, unemployment benefits recipients receive government-funded career services like job search advice, resume writing assistance, and financial assistance for commuting to work. The Opioid program group gets roughly twice as many intensive services as the DWG program group, though the types of career services are similar.

The question we attempt to answer is whether there are returns to the increased services provided to Opioid program participants. We discuss the methodology used to answer this question in this section. We also assess whether it is cost effective to offer these additional services.

The main difficulty in answering this question is that the typical participants of the Opioid grant-funded services (from hereon, the "treatment group") is different from the typical person that receives DWG-funded services (from hereon, the "control group"). For instance, the members of the control group tend to work more and have higher earnings prior to the unemployment spell that qualifies them for DWG-funded services. The Opioid program funding is directed specifically to people that have been adversely impacted by the opioid epidemic. A naïve comparison between the average career outcomes for the treatment group and the average career outcomes for the control group would not accurately measure the net impact of the treatment, since it would capture both the treatment effects and the effects attributable to *ex ante* differences between the groups. To accurately measure the *marginal net impact* of the Opioid grant-funded services, we must employ a special statistical tool called a fixed effects model.

We first define the statistical challenge to measuring the marginal net impact using the potential outcomes framework, a modeling tool that shows how the researcher can uncover cause and effect. Then, we describe the fixed effects model and discuss how it helps overcome this measurement difficulty. We conclude with a short description of the circumstances under which estimates would be incorrect (biased), and a comment on why these circumstances are unlikely to have occurred in this study.

Using the potential outcomes framework to discuss causal inference

Let $Y_{i,t}$ represent a career result for individual i in time t. Though we study several outcomes, for the sake of exposition, let $Y_{i,t}$ be the labor market earnings that a person obtains in a given quarter. We can define a variable equal to one if the person was in the treatment group, and zero if they were in the control group; call this variable D. Let X be a matrix of individuals' observable characteristics like age, education, and quarterly earnings before the unemployment spell of interest.

The naïve comparison of average outcomes for treatment and control individuals, $E[Y_{i,t}|D = 1] - E[Y_{i,t}|D = 0]$, would not account for the fact that members of the two groups are significantly different in observable characteristics prior to receiving services funded by either the Opioid grant or the DWG. They would badly mismeasure the marginal net impact of treatment. Some differences in earnings would incorrectly be ascribed to treatment when they are in fact observed because the two groups have different average earnings, for instance, before service receipt. Differences in age, education, and other observable characteristics, need to be controlled for in order to get an accurate measurement as well.

For all DWG-funded services recipients, the average impact of the DWG-funded services on participants' earnings, conditioned on observable characteristics, is $E[Y_{i,t}|D = 0, X]$. For all treatment group individuals, the conditional average is $E[Y_{i,t}|D = 1, X]$. The marginal net impact, which describes the extra effect of the treatment group services compared to the control group services, is $E[Y_{i,t}|D = 1, X]$ - $E[Y_{i,t}|D = 0, X]$. If this difference is positive, the treatment group services have a positive marginal net effect on job seekers' career outcomes.

If the researcher controls for all relevant difference between the control and treatment groups, they can accurately measure the marginal net impact. This is challenging in practice – there may be relevant variables that we don't observe. For example, we know that the treatment group individuals suffer from the adverse effects of the opioid epidemic but may not observe all of the ways in which this epidemic influences people. Maybe, on average, the treatment group suffers from high stress and anxiety. We do not measure these variables, but they may influence earnings. Since they aren't observed, they cannot be directly included in the matrix of observable characteristics, X. As such, even the more accurate measurement that conditions on observable characteristics may be incorrect. It will be less incorrect, but still incorrect.

To get an accurate measurement, we must use some statistical method that controls for these observable and unobservable characteristics. Denote the matrix of relevant but unobserved variables X^0. The measurement we want to obtain is $E[Y_{i,t}|D = 1, X, X^0]$ - $E[Y_{i,t}|D = 0, X, X^0]$. This will give an *unbiased* (accurate) measurement of the net impact on earnings of the Opioid program relative to the DWG program.

Recovering an unbiased estimate of the net impact of the Opioid program

We can estimate the naïve measure, $E[Y_{i,t}|D = 1] - E[Y_{i,t}|D = 0]$ using a linear regression:

$$Y_{i,t} = \beta_0^n + \beta_1^n D + \beta_2^n T + \beta_3^n (D * T) + \epsilon_{i,t}$$

Where T is a variable equal to one during and after service receipt, and equal to 0 beforehand. Here, β_3^n is an estimator for the difference $E[Y_{i,t}|D = 1] - E[Y_{i,t}|D = 0]$. In this model, β_0^n is an intercept, the other regression coefficients are slope parameters, and $\epsilon_{i,t}$ is a normally distributed error term. The interpretation of β_3^n is the increase in a person's quarterly earnings because they participated in the Opioid program, instead of participating in the DWG program. When we bring this model to data,[6] we get the empirical value $\hat{\beta}_3^n$ which gives the naïve (incorrect) measure of the net impact of treatment for Washington state. By improving the model, we get more accurate measures of the net impact, which all share this interpretation.

[6] We fit the model using ordinary least squares minimization.

We can include observable characteristics about people into the regression; we get a more accurate measure of the net impact, $E[Y_{i,t}|D = 1, X]$ - $E[Y_{i,t}|D = 0, X]$. This regression is

$$Y_{i,t} = X\beta' + \beta_0 + \beta_1 D + \beta_2 T + \beta_3 (D * T) + \epsilon_{i,t}$$

where β' is a vector of regression coefficients that is conformable to the matrix X. The coefficient estimate $\hat{\beta}_3$ will be more accurate than the estimate $\hat{\beta}_3^n$, but will likely still have bias.

We can estimate the value of $E[Y_{i,t}|D = 1, X, X^0]$ - $E[Y_{i,t}|D = 0, X, X^0]$ using a panel data regression.[7] In order to capture the unobserved parameters at the time of the treatment, we can use individual fixed effects. These are intercepts in a regression, such that the line of best fit for the data has, for each person, a separate intercept in each quarter. Shifting the intercepts in this way makes the slope coefficient estimates more accurate. This regression is

$$Y_{i,t} = X_{i,t}\beta^{p\prime} + \alpha_i + \alpha_t + \beta_1^p T + \beta_2^p (D * T) + \epsilon_{i,t}$$

where α_i is an individual fixed effect, α_t is a quarter fixed effect, and now the matrix of explanatory variables $X_{i,t}$ can only contain observable characteristics that vary over time, like age or the unemployment rate in an area. The individual fixed effects control for *time-invariant* individual-specific characteristics; that is, things that are true for people during the entire time we observe their data. For instance, their average stress level in the time that we observe them is controlled for in this regression. Their date of birth is controlled for, as well as their work experience at the time that they became unemployed. In addition, things like the genetic factors that influence how likely someone is to become addicted to opiates is controlled for. Many such factors are controlled for.

This updated regression, while not perfect, largely addresses the measurement concerns for calculating $E[Y_{i,t}|D = 1, X, X^0]$ - $E[Y_{i,t}|D = 0, X, X^0]$. The interpretation of $\hat{\beta}_2^p$ is the *average net impact on a person's quarterly earnings from participating in the treatment group instead of the control group.* We can also estimate this model where $Y_{i,t}$ is an employment indicator. Then the interpretation of the regression coefficient of interest is the *average net impact on a person's likelihood of employment in each quarter from participating in the treatment group instead of the control group.* These net impacts calculate the returns in the labor market from the *additional* services provided to Opioid program participants.

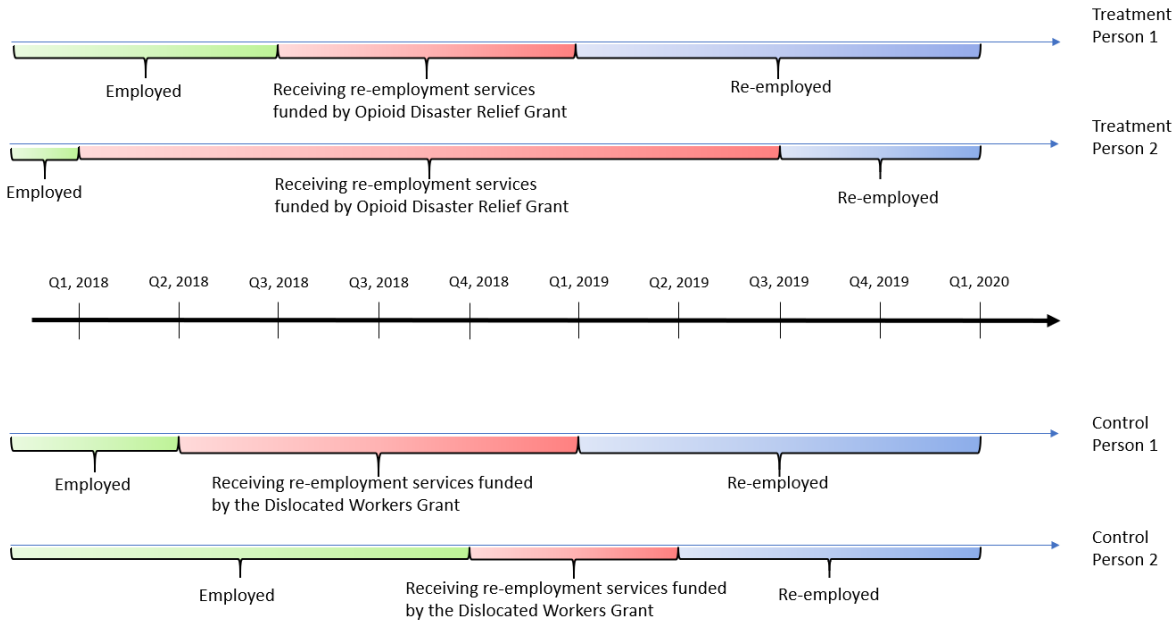
A complication induced by differences in the timing of service delivery

Since there are many different types of services that people receive, and some services last longer than others, the length of time that people spend as program participants differs. See *Figure A1-1* for a visual representation for two hypothetical Opioid program participants and two hypothetical DWG program participants.

[7] Panel data is simply a way to organize a table of data so that each column corresponds to a different variable (like age or earnings), and each row corresponds to a person in a specific quarter. If we observe an individual from quarter one of 2019 to quarter four of 2019 (four quarters), this panel data would have four rows for this individual's information.

The timing and duration of service provision can vary within and across groups. In *Figure A1-1*, each individual starts off employed. Then, they lose their job, claim unemployment benefits, and receive reemployment services. Finally, they are reemployed. The transition from employment to reemployment services, and from reemployment services to being reemployed, differs for each person. In addition, the number of services they receive differs per person and is, on average, higher for members of the treatment group.

Appendix figure A1-1. The timing of the service provision funded by the Opioid grant and DWG vary within and across groups
Washington state, third quarter 2019 through second quarter 2021
Source: Employment Security Department/DATA Division



We refine the panel data regression by differentiating between the effects of the programs on earnings during and after service receipt. This is helpful because some of the services include internships, conditional employment, and other earnings-generating services. Ideally, the additional services provided by the additional treatment services would result in a large, sustained increase in earnings during and after the program. We can test the hypothesis that this occurred by fitting the following model to our data:

$$Y_{i,t} = X_{i,t}\beta^{p\prime} + \alpha_i + \alpha_t + \beta_2^p T_1 + \beta_3^p T_2 + \beta_4^p (D * T_1) + \beta_5^p (D * T_2) + \epsilon_{i,t}$$

Where the variables T_1 and T_2 are indicators for whether the job seeker is in the "receiving reemployment services" or "reemployed" phase of their career. The coefficient β_4^p measures the quarterly impact of participating in the treatment program on earnings *during the program*, instead of

participating in the control program. The coefficient β_5^p measures the quarterly impact of participating in the treatment program on earnings *after the program*, instead of participating in the control program. The total average treatment effect (ATE) of the treatment services, relative to control services, is

$$ATE = \hat{\beta}_4^p(average\ number\ of\ quarters\ receiving\ services) +$$

$$\hat{\beta}_5^p(average\ number\ of\ observed\ quarters\ that\ they\ are\ reemployed\ ).$$

Identifying assumptions

The average treatment effect would be mismeasured if there exist variables that (1) vary over time and across people, (2) impact earnings, and (3) are systematically different between the two groups. Any time-invariant cofounder is controlled for by the individual fixed effects. Any time-varying cofounder that doesn't vary across people is controlled for by the quarter fixed effect. Any time-varying variable that differs across people and is correlated with earnings must also systematically differ across the control and treatment groups. Such a variable may exist, in which case, the ATE reported here would be biased (incorrect). The error in the results would be proportional to item (2). Including the individual fixed effect, and the short length of the observation period, make it likely that no such variable exists. In addition, differences in timing of treatment can lead to bias in standard difference-in-differences models. For identification, we must also assume this does not occur in this context.

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