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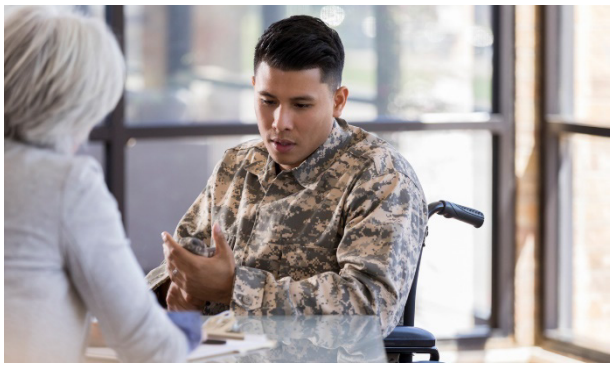

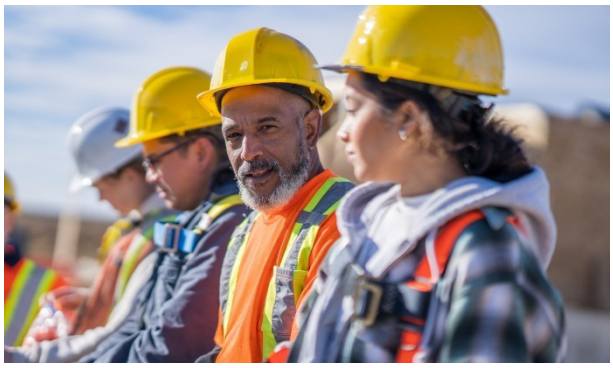

Impact of the Homeless Veterans' Reintegration Program on Employment and Earnings Outcomes

Final Report

December 2024

Matthew Johnson, Jessica Wagner, Peter Schochet, Ariella Spitzer, and Peter Kress

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Submitted to:

U.S. Department of Labor
Chief Evaluation Office
200 Constitution Avenue, NW
Washington, DC 20210
Attention: Marie-Ellen Ehounou

Submitted by:

Mathematica
P.O. Box 2393
Princeton, NJ 08543-2393
Phone: (609) 799-3535
Fax: (609) 799-0005

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Other study publications:

1. "Research Brief: Impact of the Homeless Veterans' Reintegration Program on Employment and Earnings Outcomes"
2. "Infographic: Impact Study of the Homeless Veterans' Reintegration Program (HVRP)"
3. "Supporting the Employment of Veterans Experiencing Homelessness: Implementation Study Report for the Evaluation of the Homeless Veterans' Reintegration Program (HVRP)"
4. "HVRP Evaluation Brief: The Experiences and Perspectives of Veterans Participating in the Homeless Veterans' Reintegration Program (HVRP)"
5. "HVRP Evaluation Brief: Co-Enrollment of Homeless Veterans' Reintegration Program (HVRP) Participants in a Program at an American Job Center"
6. "HVRP Evaluation Brief: Services Provided to Homeless Veterans' Reintegration Program (HVRP) Participants at American Job Centers"
7. "HVRP Evaluation Brief: Providing Public Employment Services to Veterans Experiencing Homelessness: Gaps and Opportunities"

Study publications are available at: https://www.dol.gov/agencies/oasp/evaluation/completedstudies/Homeless-Veterans-Reintegration-Program-Impact-Evaluation.

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Contents

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Executive Summary

The Homeless Veterans' Reintegration Program (HVRP) is the only federal grant program focused exclusively on helping veterans experiencing homelessness find stable employment. Since 1987, the U.S. Department of Labor's (DOL) Veterans' Employment and Training Service (VETS) has administered the program. Between July 1, 2022, and June 30, 2023, HVRP grant recipients nationwide served over 17,000 veterans experiencing homelessness or at risk of homelessness (U.S. Department of Labor 2024a). The goals of HVRP call for providing career training, placement, and support services to veterans experiencing homelessness or at risk of homelessness. Using a case management approach, grant recipients tailor their services to the needs of individual veterans and provide both direct services and referrals to community partners.

To assess the impact of HVRP, the DOL Chief Evaluation Office, in collaboration with VETS, in 2017 contracted with Mathematica and its subcontractors, the Urban Institute and Social Policy Research Associates, to complete a mixed-methods evaluation of the program. The evaluation consists of two studies: (1) a quasi-experimental treatment–comparison group impact study using administrative data and (2) a complementary implementation study.

This report presents findings from the evaluation's impact study, which compared the employment and earnings outcomes for HVRP participants with the outcomes of similar veterans who experienced homelessness but did not participate in HVRP. Both groups were enrolled in the Wagner-Peyser Employment Service at an American Job Center. Mathematica conducted the analysis using data from 11 locations—10 states and the District of Columbia—that agreed to provide the information needed to obtain administrative earnings records for measuring study outcomes. The analysis includes veterans experiencing homelessness who received services between July 2019 and June 2021 (in program years 2019 and 2020). Findings from the evaluation's implementation study, which this report draws on to help interpret the impact findings, are presented in Batko et al. (2022) and Johnson et al. (2022). The key finding of the impact study is that HVRP participation increased employment and earnings during the first year after program enrollment but did not lead to longer-term impacts.

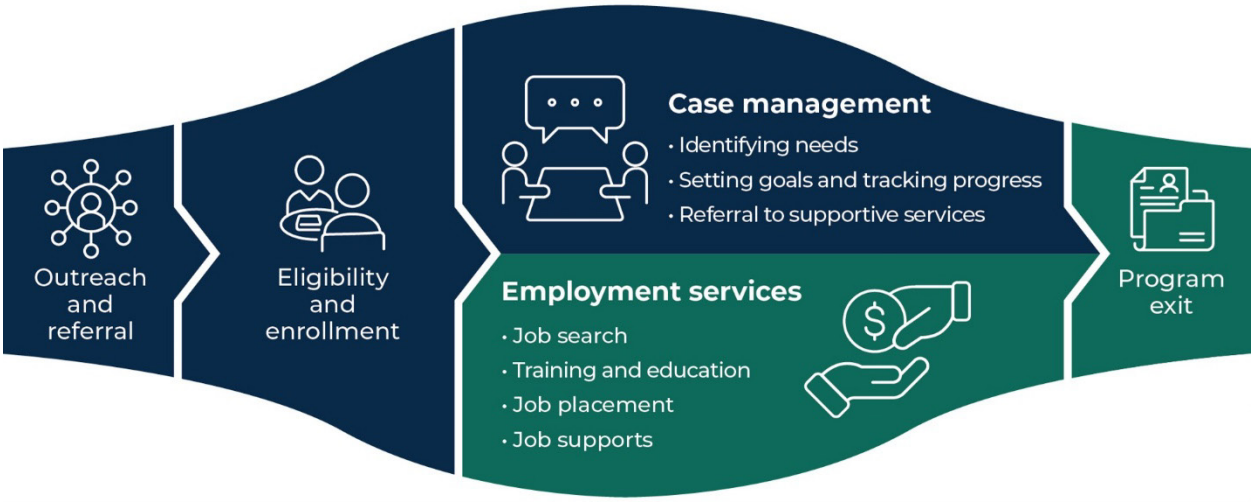
A. HVRP background

In 1987, the Stewart B. McKinney Homeless Assistance Act authorized HVRP. VETS administers the program through a competitive grant program. Organizations eligible to apply for HVRP grants include state and local workforce development boards; government agencies; higher education institutions; federally recognized tribal governments and other tribal organizations; small businesses; and other for-profit, nonprofit, or faith-based organizations (U.S. Department of Labor 2023a).

HVRP grant competitions are held annually. In June 2024, DOL announced awards of $57 million to 157 HVRP grant recipients (U.S. Department of Labor 2024b). Since July 2020, HVRP grants have had a period of performance of three years. However, prior to this, which includes part of the study sample, HVRP grant recipients needed to apply annually to continue the HVRP grant, with the continuation of the grant contingent on meeting program performance goals.

In Exhibit ES.1, we summarize the path through HVRP services, beginning with outreach and partner referrals to identify and enroll eligible veterans, extending through case management and employment service receipt, and concluding with program exit.

Exhibit ES.1. Flow of HVRP services



Source: Batko et al. (2022) synthesis based on a review of HVRP grantee survey results and site visits.

HVRP grant recipients rely on a combination of outreach and partner referrals to identify veterans who are eligible for HVRP and can benefit from the program. Common sources for recruiting veterans for HVRP include emergency shelters, American Job Centers, and U.S. Department of Veterans Affairs (VA) medical centers and clinics (Batko et al. 2022). In addition to recruiting veterans actively for HVRP, grant recipients receive referrals from partner programs such as the Federal Emergency Management Agency, Native American Housing Assistance and Self Determination Act grant recipients, VA's Supportive Services for Veteran Families Program, VA's Grant and Per Diem transitional housing program, the VA Supportive Housing program, and other community service providers.

After veterans connect with an HVRP grant recipient, HVRP staff work with the veterans to determine whether they meet the program's eligibility criteria and would benefit from receiving employment services. In cases where HVRP grant recipients determine that veterans are not ready for employment, for example, due to substance abuse or mental health concerns, grant recipients refer those veterans to other services to help them become job-ready. If the veterans meet program eligibility requirements and the HVRP grant recipient determines they would benefit from employment services, the HVRP grant recipient enrolls them in the program.

Upon enrollment, HVRP staff provide case management services, which can include identifying veterans' needs for employment services, creating an individualized employment plan, and referring participants to support services. To connect participants with substance abuse, mental health, health care, housing, and child care services, HVRP staff refer participants to grant partners such as the local U.S. Housing and Urban Development (HUD) Continuum of Care Program, the HUD-Veterans Affairs Supportive Housing (HUD-VASH) Program, VA health care services, and other community-based services (Batko et al. 2022).

HVRP grant recipients are required to co-enroll participants in one of three DOL-funded employment-related programs at an American Job Center: (1) the Adult and Dislocated Worker Programs funded under the Workforce Innovation and Opportunity Act (WIOA), (2) the Wagner-Peyser Employment Service, or (3) the Jobs for Veterans State Grant (JVSG) Program (U.S. Department of Labor 2016).

Veterans receive employment services either directly through HVRP or from other employment-related programs in which participants are co-enrolled. Employment services include job search assistance, assistance in obtaining tools or work clothing, job placement services, and work readiness or basic skills training (Batko et al. 2022).

One of HVRP's primary goals is to help participants find employment; in fact, participants typically exit from the program once they are placed in a job (National Veterans' Technical Assistance Center 2021). After program exit, HVRP grant recipients often continue to provide follow-up services, which may include transportation vouchers, assistance with tools or clothes for work, and assistance in developing a job retention plan (Batko et al. 2022).

B. Overview of the HVRP impact evaluation

The HVRP impact evaluation used a quasi-experimental comparison group design to compare key employment-related outcomes for HVRP participants against the outcomes of similar veterans experiencing homelessness but who did not participate in HVRP. A gold-standard, randomized controlled trial was not feasible as veterans receive priority of service for DOL-funded employment and training services (U.S. Congress 2002). Thus, denying services to veterans assigned to the control group could have raised ethical concerns among program providers.

Both the HVRP and comparison samples came from local areas served by HVRP grant recipients, ensuring that the two samples faced similar labor market and service environments. With both groups enrolled in the Wagner-Peyser Employment Service, the study assessed the additional impact of HVRP beyond services available through the Wagner-Peyser Employment Service. The research questions, study outcomes, and analysis approach were pre-specified in an analysis plan available on DOL's website.[1]

The evaluation measured the impacts of HVRP on participants' employment and earnings covering the two years (eight calendar quarters) after program enrollment. The confirmatory research questions pertained to labor market impacts in the seventh and eighth quarters after enrollment (Box 1). The exploratory research questions addressed the pattern of impacts over the first eight quarters to examine how impacts changed over time. To provide policy-relevant information on what worked and for whom, the questions also addressed the extent to which impacts differed for key groups of HVRP participants and HVRP grant recipients. In particular, the study assessed the extent to which impacts differed for HVRP participants who enrolled before and after the onset of the COVID-19 pandemic, who may have had different program experiences because of the remote work and changed HVRP service environment occasioned by the pandemic.

[1] https://www.dol.gov/agencies/oasp/evaluation/completedstudies/Homeless-Veterans-Reintegration-Program-Impact-Evaluation.

Box 1. Research questions

Confirmatory research questions

What was the impact of enrolling in both HVRP and the Wagner-Peyser Employment Service relative to enrolling in only the Wagner-Peyser Employment Service on:

1. Employment in the eighth quarter after program enrollment?
2. Average earnings in the seventh and eighth quarters after enrollment?

Exploratory research questions

1. What was the pattern of quarterly employment and earnings impacts over the two-year follow-up period?
2. What were the impacts on job tenure?

Did the impacts differ for:

1. Participants who began receiving HVRP services before and after the onset of COVID-19?
2. Participants with different characteristics (age, gender, education, recent employment experience, and county unemployment rate)?
3. HVRP grant recipients with different implementation features related to partnership strength, case management, and employer relationships?

The impact study drew on information from four data sources:

1. **Workforce Integrated Performance System (WIPS).** WIPS is a database maintained by DOL's Employment and Training Administration for purposes of performance reporting. It contains data on participants in DOL-funded workforce programs and includes indicators for veteran status, homelessness, and HVRP and Wagner-Peyser Employment Service participation that the study used to identify the study samples. The data also include demographic and location information that we used to construct weights for the comparison group to ensure that the group's weighted characteristics matched those of the HVRP sample.
2. **HVRP Technical Performance Reports (TPR).** HVRP grant recipients' TPRs include rosters of HVRP participants that we used to improve the accuracy of the HVRP indicator variable in WIPS.
3. **Social Security numbers (SSN) from 10 states and the District of Columbia.** To match data from WIPS to administrative employment and earnings records, the study required sample members' SSNs. Workforce agencies in 10 states and the District of Columbia agreed to provide SSNs: Arizona, Florida, Georgia, Michigan, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, and Washington.
4. **National Directory of New Hires (NDNH).** Maintained by the Office of Child Support Services in the U.S. Department of Health and Human Services, NDNH data contain labor market information collected through the Unemployment Insurance system. The data provided the quarterly employment and earnings information for the study, which covered the three quarters before program enrollment and the eight quarters after program enrollment.

The HVRP study sample includes 1,184 HVRP participants enrolled in the Wagner-Peyser Employment Service from 42 of the 226 active HVRP grant recipients during program years 2019 and 2020 (between July 2019 and June 2021). Though the HVRP sample is not necessarily nationally representative, the characteristics of the sample are similar to a nationwide sample of HVRP participants who co-enrolled in the Wagner-Peyser Employment Service during the study period.

The study sample includes 2,523 comparison individuals who were also veterans experiencing homelessness and enrolled in the Wagner-Peyser Employment Service at the same time as HVRP participants' enrollment in HVRP; members of the comparison group resided in areas served by HVRP grant recipients in the study states. To create a comparison group as similar as possible to HVRP participants, we estimated models to construct weights, with larger weights assigned to comparison group members who were more rather than less similar to HVRP participants. The models included pre-enrollment demographic characteristics from WIPS, pre-program employment and earnings measures from the NDNH data, and county characteristics from the American Community Survey. The characteristics of the comparison group after weighting were similar to those of the HVRP group, according to thresholds commonly applied in the literature.

We estimated impacts by comparing the mean outcomes of HVRP participants to the weighted mean outcomes of the comparison sample. To improve the precision of the estimated impacts, we estimated weighted regression models that controlled for pre-program variables (yielding "doubly-robust" estimates, which are unbiased if either the model used to develop the weights or the model used to estimate impacts is correctly specified).

Despite the rigor with which we designed and implemented the impact study, caution is warranted in interpreting the results, for several reasons.

- *The analysis for the quasi-experimental design could not account for potential unobservable differences that might have existed between the HVRP and comparison groups.* Despite the strong similarity in the pre-program labor market and demographic characteristics of the two groups, unobservable factors, such as job readiness and motivation, could bias the estimates. That is, if unobserved differences between the HVRP and comparison groups caused changes in the outcomes, our estimates would not reflect the true impact of HVRP. Nonetheless, several study design features may have mitigated this bias. First, the comparison sample also includes individuals classified as veterans experiencing homelessness in WIPS who likely faced similar employment barriers and service needs as the HVRP sample. Second, both groups were motivated to seek employment services through the Wagner-Peyser Employment Service.
- *The impact sample is not necessarily nationally representative of all HVRP participants in program years 2019 and 2020*. The study sample is a convenience sample because (1) the sample includes only those co-enrolled in the Wagner-Peyser Employment Service, and (2) the sample comes from only those states that agreed to provide SSNs. Our impact estimates therefore may not be generalizable to HVRP participants who co-enrolled in programs other than the Wagner-Peyser Employment Service or received services from grant recipients in states not included in the study.
- *The study measured impacts during the COVID-19 pandemic*. About half of HVRP participants in the sample began receiving services after the onset of the pandemic, and all HVRP participants and comparison individuals were exposed to volatile pandemic-era labor market conditions at some point during the study's follow-up period. Findings from the implementation study suggest that the pandemic caused significant service disruptions, such as the shift from in-person to virtual service delivery that adversely affected partnerships and referrals for several months (Batko et al. 2022). Thus, the impact findings may not be representative of impacts during normal times.

- *The funding model for HVRP changed from a one-year grant to a three-year grant during the study period*. Before this shift, grant recipients may have felt pressure to find rapid job placements for HVRP participants to meet one-year performance goals. This change coincided with the onset of the COVID-19 pandemic, which presents a challenge to isolating how this change affected HVRP impacts independent of pandemic disruptions. Additional years of data after the COVID-19 pandemic receded would need to be analyzed to understand the impacts of HVRP under the current three-year grant timeline.
- *The study did not collect data on housing and health outcomes that could be affected by HVRP participation.* No national data sources for these outcomes were available at the time of the study, and obtaining these data from local sources would have been prohibitively expensive given the geographically dispersed sample. It was also not economically feasible to conduct a survey to collect these outcomes; moreover, a survey on housing and health outcomes would likely have resulted in low response rates due to the sample's unstable contact information. Thus, the study does not necessarily account for the full benefits of HVRP on participants' outcomes.

C. Impact findings

The impact study addresses the following overarching research question: **Compared with enrollment in only the Wagner-Peyser Employment Service, what was the impact of enrollment in both the HVRP and the Wagner-Peyser Employment Service on employment and earnings outcomes?** This contrast is policy relevant as it is likely that many HVRP participants would seek employment-related services at American Job Centers if HVRP were not an option. Thus, participation in the Wagner-Peyser Employment Service serves as a realistic "counterfactual" for the study.

The impact findings can be summarized as follows:

- **HVRP participation had no effect on employment and earnings in the seventh and eighth quarters after program enrollment (Exhibit ES.2).** The estimate of HVRP's impact on eighth-quarter employment is 1.5 percentage points, which is not statistically significant at the 5 percent level. In the eighth quarter, 45.6 percent of HVRP group members were employed, compared to 44.1 percent of the weighted comparison group. The impact estimate for average earnings over quarters seven and eight is also not statistically significant. During this period, the HVRP group earned $3,222 per quarter on average and the weighted comparison group earned $3,541 per quarter on average, for a difference of negative $319.

Exhibit ES.2. Impact of HVRP participation: Confirmatory outcomes

Outcome	HVRP group mean	Comparison group mean	Impact estimate	Standard error	*p*-value
Employment eight quarters after program enrollment	0.456	0.441	0.015	0.019	0.42
Average earnings in the seventh and eighth quarters after program enrollment	$3,222	$3,541	-$319	$205	0.12

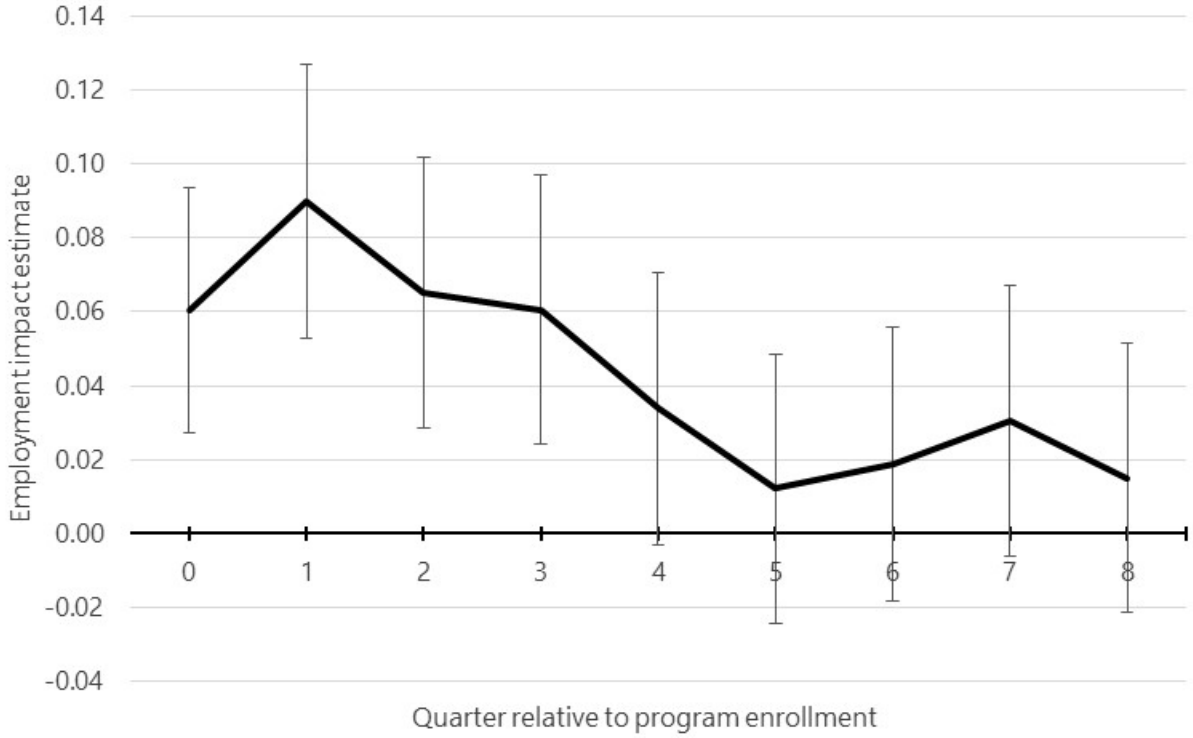
Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. We calculated the HVRP group mean by adding the impact estimate to the comparison group mean. For a detailed description of estimation methods, see the appendix. The sample includes 1,179 HVRP participants and 2,462 comparison group members.

- **HVRP participation increased employment during the quarter of program enrollment and the following three quarters (Exhibit ES.3).** HVRP participants were 6 percentage points more likely to be employed than the comparison group during the quarter in which they enrolled in the program, and they were 6 to 9 percentage points more likely to be employed in the first three quarters following enrollment. The effects dissipated in the fourth quarter and stabilized around a statistically insignificant 2 percentage points throughout the second year following program enrollment.

  This pattern of employment impacts is consistent with findings from the implementation study, in which HVRP grant recipients reported that they helped participants find jobs quickly and provided services primarily over the first year after job placement. The finding that the positive employment impacts did not persist is also consistent with reports from HVRP participant interviews that job placements were not always desirable, possibly affecting participant employment rates over the long term.

Exhibit ES.3. Impact of HVRP participation on quarterly employment



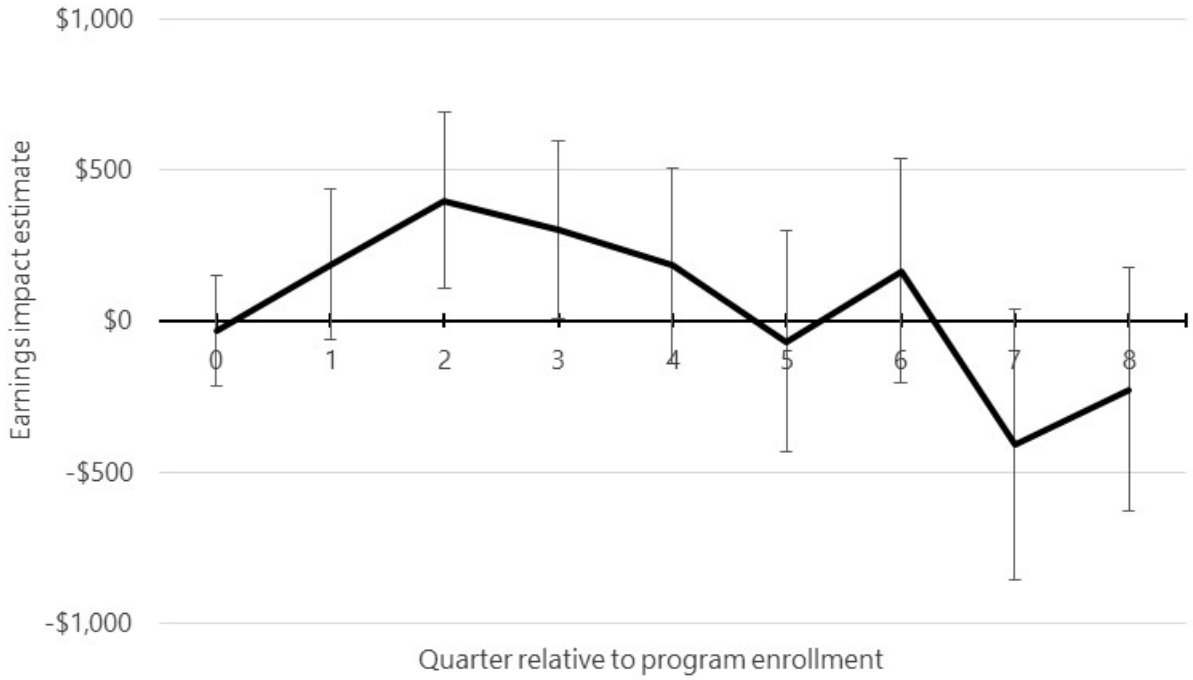
Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter. The black line represents the impact estimate in each quarter. Error bars represent the 95 percent confidence interval. Impacts are estimated separately for each quarter.

- **HVRP participation had positive and statistically significant quarterly earnings impacts of $400 and $300 in the second and third quarters after program enrollment (Exhibit ES.4).** The impact estimates in the first quarter after program enrollment ($186) and the fourth quarter after program enrollment ($183) were not statistically significant. Over the first year, on average, HVRP participants

earned $267 more per quarter than the control group ($2,635 versus $2,368), which is an 11.3 percent earnings gain relative to the comparison group mean (shown in the full report). Similar to the confirmatory findings, the earnings impacts in the seventh and eighth quarters were negative but not statistically significant.

Exhibit ES.4. Impact of HVRP participation on quarterly earnings



Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. The black line represents the impact estimate in each quarter. Error bars represent the 95 percent confidence interval. Impacts are estimated separately for each quarter. The third quarter impact estimate is statistically significant at the 5 percent level.

- **Consistent with the pattern of impact findings on employment and earnings, HVRP participation increased job tenure in the first post-enrollment year.** The longest job tenure, defined as the longest number of consecutive quarters an individual worked for the same employer, was 0.167 quarters (or about two weeks) longer for HVRP participants than for members of the comparison group (1.62 versus 1.45 quarters), or 11.5 percent longer. This result suggests that HVRP reduced job turnover during the first year. These effects, however, did not persist into the second year after program enrollment.
- **Some evidence suggests larger and more persistent employment effects for those who enrolled in HVRP before the onset of COVID-19 than for those who enrolled after the onset.** Even though the differences in impact estimates between the two groups are not statistically significant, the differences in the pattern of effects are noteworthy. Positive employment impacts emerged for both groups in the quarter of program enrollment (shown in the full report). However, impacts for the post-pandemic cohort decreased starting in the third quarter after program enrollment and were close to zero after the fourth quarter. In contrast, impacts for the pre-pandemic cohort were about 5 percentage

points throughout the follow-up period, though the effects were no longer statistically significant after the fourth quarter. A similar pattern emerged across the two groups for quarterly earnings impacts. The findings for the post-pandemic group likely reflect the unique service environment the group faced at the time of program enrollment and may not be representative of the possible impacts of HVRP for this cohort in the absence of the pandemic.

- **We found no evidence that impacts differed for groups defined by participant demographic and county characteristics.** We hypothesized that HVRP effects could differ for HVRP participants with different backgrounds and experiences if they faced different employment barriers and service needs. However, we found no evidence of differences in the pattern of effects across groups defined by gender, age, education level, and recent employment experience. We also found similar effects for veterans living in local areas with relatively high unemployment rates, compared to local areas with relatively low unemployment rates where job opportunities may have been more plentiful.
- **We found no strong associations between grant recipient-specific impacts and the measured HVRP program features.** To assess whether certain program models and service features were associated with more positive program impacts, we constructed key measures of HVRP implementation by using grantee survey data from the implementation study. These measures captured partnership strength (for example, the number of strong partners considered critical to program success), components of case management (for example, the number and types of services case managers provided directly and time spent working directly with participants), and relationships with employers (for example, the number of work-based service types provided). The analysis did not find any strong associations, but we estimated the relationships among only 25 grant recipients for which survey data were available, so the analysis had low power for detecting associations.

D. Conclusions

Our findings suggest that HVRP participation did not lead to gains in employment and earnings after two years. However, the program did increase employment and earnings during the first year after program enrollment. This was the time when most HVRP participants received the program's case management and supportive services. The one-year period of performance for HVRP grants, which could have motivated grant recipients to prioritize rapid job placement over job fit quality, may have affected the sustainability of the early employment effects. The lack of effects after two years may also reflect the complex challenges facing HVRP participants, such as mental health and substance abuse issues, which may have impeded job retention and job search efforts. Overcoming these obstacles in the longer term may require more prolonged and intensive program services than HVRP participants received during the study period.

The impact results must be interpreted in the context of the COVID-19 pandemic. Batko et al. (2022) found that the pandemic disrupted HVRP services, especially referrals to partners. Our study yielded suggestive evidence that impacts were smaller among HVRP participants who started receiving HVRP services after the onset of the pandemic than among those who enrolled before the pandemic.

The study results should also be interpreted in terms of the study's focus on earnings and employment outcomes. Even though HVRP provides employment-related services, the program model also connects

participants to available housing and health care services in local areas. Thus, HVRP may affect a broader range of participant outcomes that the study did not address.

To inform program improvement efforts, future research could provide greater insight into which HVRP features and models are most directly associated with positive program effects. Our study did not find any strong relationships, although measures of service implementation were collected for only a small number of grant recipients. In addition, future research could consider how the change from the one-year funding model to the three-year funding model affected the types of jobs that participants found. The shift in the model may have allowed programs to develop strategies that prioritize a better alignment between job placements and participant skills and interests, perhaps improving program effectiveness.

Finally, future research could conduct a comprehensive benefit-cost analysis to assess whether HVRP is a sound investment from the social, taxpayer, and participant perspectives. For example, if the costs of HVRP per participant were relatively low, earnings impacts in the first year after program enrollment that fade out by the second year could result in total earnings gains that are larger than the costs of the program. Such an analysis would ideally compare program benefits associated with the full range of outcomes (including housing and health outcomes) to full program costs (including the costs of HVRP operations as well as differences in costs of other services received by HVRP participants and the study comparison group).

I. Introduction

In January 2022, more than 33,000 veterans were experiencing homelessness (de Sousa et al. 2022). Homelessness is associated with multiple negative outcomes, including family and employment instability, poor health, and increased interactions with the criminal justice system (Rountree et al. 2019; Culhane and Byrne 2010). Veterans also face complex challenges that put them at particular risk of becoming homeless. For example, service-related trauma can cause physical and mental disabilities, mental health challenges, and substance use issues (Balshem et al. 2011; Tsai and Rosenheck 2015).

Though the causes of homelessness are complex, unemployment is a major factor (Zachary et al. 2020). Veterans transitioning to civilian life report that finding a job is a major challenge (Iraq and Afghanistan Veterans of America 2012). Though veterans currently have similar unemployment rates as nonveterans with similar demographic characteristics, veterans are less likely to participate in the labor force and, on average, earn less (Chakrabarti et al. 2023).

The Homeless Veterans' Reintegration Program (HVRP) is the only federal grant program focused exclusively on helping veterans experiencing homelessness find stable employment. Since 1987, the U.S. Department of Labor's (DOL) Veterans' Employment and Training Service (VETS) has administered HVRP. Between July 1, 2022, and June 30, 2023, HVRP grant recipients nationwide served over 17,000 veterans experiencing homelessness or at risk of homelessness (U.S. Department of Labor 2024a). The goals of HVRP call for providing career training, placement, and support services to veterans experiencing homelessness or at risk of homelessness. By using a case management approach, grant recipients tailor their services to the needs of individual veterans and provide both direct services and referrals to community partners.

To assess the impact of HVRP, the DOL Chief Evaluation Office, in collaboration with VETS, contracted with Mathematica and its subcontractors, the Urban Institute and Social Policy Research Associates, to conduct a mixed-methods evaluation of the program. The evaluation consists of two studies: (1) a quasi-experimental impact study using administrative data and (2) a complementary implementation study.

In this report, we present findings from the evaluation's impact study, which used a comparison group design to compare key employment-related outcomes of HVRP participants with the outcomes of similar veterans experiencing homelessness who did not participate in HVRP. Both groups were enrolled in the Wagner-Peyser Employment Service at an American Job Center. Mathematica conducted the study using data from 11 locations—10 states and the District of Columbia—that agreed to provide information needed to obtain administrative earnings records for the sample. Veterans who received services between July 2019 and June 2021 (program year 2019 or program year 2020) were included in the analysis, and the study analyzed their outcomes for eight quarters after program enrollment.

In the remainder of this chapter, we provide an introduction to HVRP (Section A), a description of previous evidence about HVRP and similar programs (Section B), an overview of the HVRP evaluation (Section C), and a discussion of the study's limitations (Section D). We conclude the chapter by describing the remainder of the report (Section E).

A. HVRP background

In 1987, the Stewart B. McKinney Homeless Assistance Act authorized HVRP. VETS administers the program through a competitive grant program. Organizations eligible to apply for HVRP grants include state and local workforce development boards, government agencies, higher education institutions, federally recognized tribal governments and other tribal organizations, small businesses, and other for-profit, nonprofit, or faith-based organizations (U.S. Department of Labor 2023a).

HVRP grant competitions are held annually. In June 2024, DOL announced awards of $57 million to 157 HVRP grant recipients (U.S. Department of Labor 2024b). HVRP grants currently have a period of performance of three years—123 of the 157 HVRP grant recipients in 2024 were receiving funding for an additional year of their grant while the other 34 were in the first year of new three-year grants.

The typical grant period of performance changed over the impact study period. Prior to July 2020 (program year 2019 and earlier), HVRP grants were administered on an annual basis (U.S. Department of Labor 2019). Grant recipients had the option of applying to continue the HVRP grant in the following program year, with continuation of the grant contingent on meeting performance goals. Seven performance goals guided program year 2019: (1) number of participants enrolled; (2) job placement rate; (3) average hourly wage at placement; (4) job placement rate for the chronically homeless; (5) percentage participants exiting the program who were in unsubsidized employment in the second quarter after program exit; (6) percentage participants exiting the program who were in unsubsidized employment in the fourth quarter after program exit; and (7) median earnings of program participants in unsubsidized employment in the second quarter after program exit (U.S. Department of Labor 2019).

Starting in July 2020 (program year 2020), HVRP grants covered a 36-month period of performance (U.S. Department of Labor 2020). Grant recipients still had to meet performance goals similar to the ones listed above, but they did not need to apply to continue grants annually.

Eligibility for HVRP services

Veterans discharged from the military (under conditions other than dishonorable discharge) are eligible for HVRP services if they meet any of the following criteria (U.S. Department of Labor 2023b):

- Experienced homelessness at any time during the 60 days before enrolling in the program
- At risk of homelessness within the next 60 days
- Participating in the U.S. Department of Housing and Urban Development-Veterans Affairs Supportive Housing Program (HUD-VASH), the Tribal HUD-VASH program, or the VA Supportive Services for Veteran Families
- Receiving assistance under the Native American Housing Assistance and Self-Determination Act of 1996
- Homeless women veterans and homeless veterans with children
- Recently released from incarceration and are at risk of homelessness
- Transitioning from incarceration

HVRP service structure

In Exhibit I.1, we summarize the path through HVRP services, beginning with outreach and partner referrals to identify eligible veterans, extending through case management and service receipt, and concluding with program exit.

Exhibit I.1. Flow of HVRP services

Source: Batko et al. (2022) synthesis based on a review of HVRP grantee survey results and site visits.

HVRP grant recipients rely on a combination of outreach and partner referrals to identify veterans eligible for HVRP who can benefit from the program. Common sources for recruiting veterans for HVRP include emergency shelters, American Job Centers, and U.S. Department of Veteran Affairs (VA) medical centers and clinics (Batko et al. 2022). In addition to actively recruiting veterans for HVRP, grant recipients receive referrals from partner programs such as the Federal Emergency Management Agency, Native American Housing Assistance and Self Determination Act grant recipients, VA's Supportive Services for Veteran Families Program, VA's Grant and Per Diem transitional housing program, the VA Supportive Housing program, and other community service providers.

After veterans connect with the HVRP grant recipient, HVRP staff work with the veterans to determine whether they meet the program's eligibility criteria and would benefit from receiving employment services. In cases where HVRP grant recipients determine that veterans are not ready for employment, for example, due to substance abuse or mental health concerns, grant recipients refer those veterans to other services to help them become job-ready. If the veterans meet program eligibility requirements and the HVRP grant recipient determines they would benefit from employment services, the HVRP grant recipient enrolls them in the program. Upon enrollment, HVRP staff provide case management services, which can include identifying veterans' needs for employment services, creating an individualized employment plan, and referring participants to support services. HVRP case managers typically meet with participants weekly, with more frequent interactions occurring soon after enrollment (Batko et al. 2022). To connect participants with substance abuse, mental health, health care, housing, and child care services, HVRP staff refer participants to grant partners such as the local U.S. Housing and Urban Development (HUD)

Continuum of Care Program, the HUD-VASH Program, VA health care services, and other community-based services (Batko et al. 2022).

HVRP grant recipients are also required to co-enroll participants in one of three DOL-funded employment-related programs at an American Job Center: (1) the Adult and Dislocated Worker Programs funded under the Workforce Innovation and Opportunity Act (WIOA); (2) the Wagner-Peyser Employment Service; or (3) Jobs for Veterans State Grant (JVSG) Program (U.S. Department of Labor 2016). Veterans receive employment services directly through HVRP or from other employment-related programs in which they co-enroll. Employment services include job search assistance, assistance in obtaining tools or work clothing, job placement services, and work readiness or basic skills training (Batko et al. 2022).

One of the primary goals of HVRP is to connect participants with jobs; participants typically exit from the program once they are placed in a job (National Veterans' Technical Assistance Center 2021). After job placement, HVRP grant recipients continue following up with participants, with most case managers contacting participants monthly or quarterly (Batko et al. 2022). The follow-up services HVRP grant recipients provide may include transportation vouchers, assistance with tools or clothes for work, and assistance with developing a job retention plan (Batko et al. 2022).

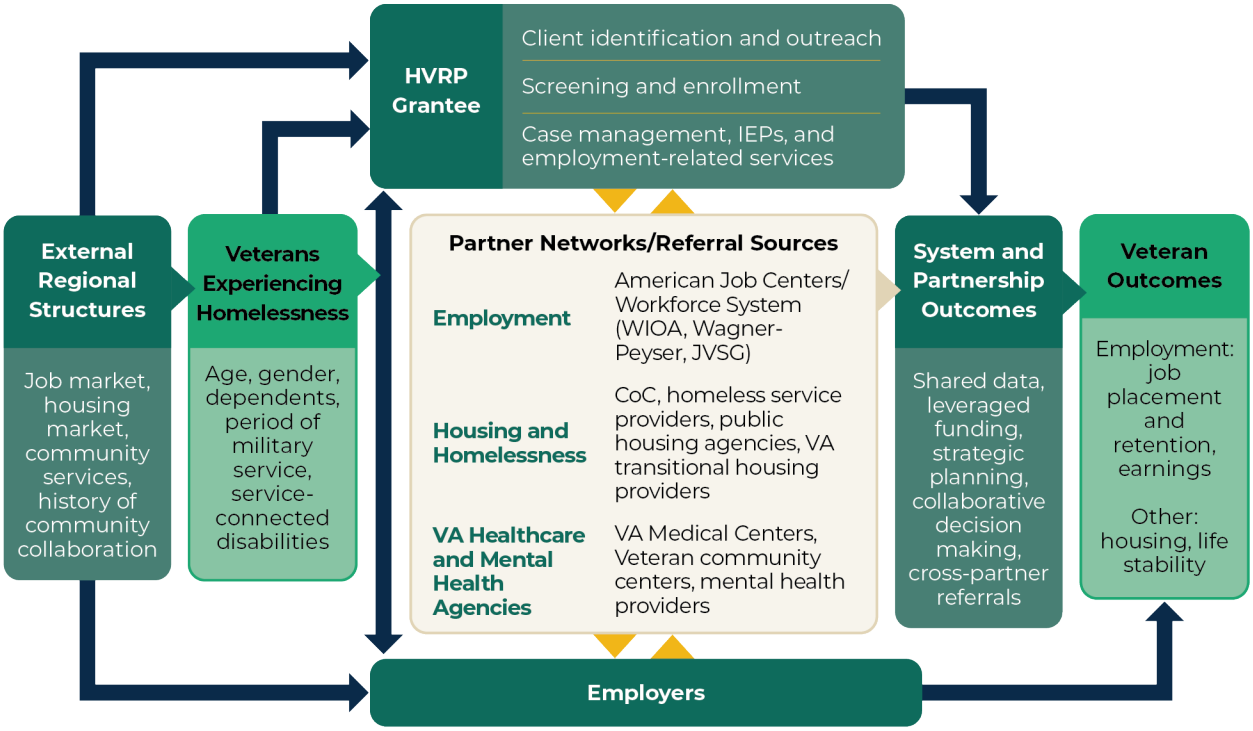
HVRP conceptual framework

In Exhibit I.2, we present the conceptual framework developed in the HVRP evaluation implementation report that links HVRP services to the employment-related and housing outcomes of HVRP participants (Batko et al. 2022). The framework incorporates various characteristics of individual veterans, grant recipient agencies, grant recipient partners, and grant recipient locations:

- *HVRP grant recipients* aim to reintegrate veterans experiencing homelessness into the labor force through a program model that includes outreach and recruitment; screening and assessment; program enrollment; case management services; and employment, training, and support services tailored to participant needs.
- *External regional structures* affect the framework and the veterans themselves. These external forces may include local labor market and housing conditions as well as the availability of community support services outside the HVRP partner networks.
- *Veterans experiencing homelessness* or at risk of homelessness with varying demographic characteristics such as age, gender, and disability status enter the program and obtain services from HVRP grant recipients.
- *Partner networks and referral sources* are important resources that grant recipients use, expand, or develop to meet the needs of veterans experiencing homelessness. HVRP grant recipients are expected to build a strong network of partners to provide services, including services that grant recipients cannot provide directly (U.S. Department of Labor 2020).
- *Employers* are both partners and customers of HVRP grant recipients. As partners, employers agree to consider hiring HVRP participants and, potentially, to train them through work-based learning. As customers, employers rely on HVRP to fill vacancies; grant recipients must thus ensure employer satisfaction with the veterans they place in vacant positions. Dissatisfied employers may be less willing to hire HVRP participants in the future.

- *System and partnership outcomes* can be positively affected through collaborations among grant recipients and partners that serve veterans under HVRP.
- *Veteran outcomes* in the form of improved employment, housing, and life (encompassing health, mental health, and family) stability are potential program benefits for participating veterans.

Exhibit I.2. Conceptual framework linking HVRP services to improved outcomes for veterans



Source: Batko et al. (2022) synthesis based on a review of HVRP grant announcements (U.S. Department of Labor 2020), a formative evaluation of HVRP (Trutko et al. 2016), program year 2020 grant applications, and HVRP implementation evaluation data (2020–2021).

CoC = Continuum of Care; HVRP = Homeless Veterans' Reintegration Program; IEP = Individual Employment Plan; JVSG = Jobs for Veterans State Grants; VA = U.S. Department of Veterans Affairs; WIOA = Workforce Innovation and Opportunity Act.

B. Research on HVRP and other employment-focused programs

In this section, we summarize prior research about HVRP and other employment-focused programs. Past studies have documented details about HVRP program implementation, but no study has undertaken a rigorous impact evaluation of HVRP. For example, a study by the National Veterans Technical Assistance Center analyzed the coordination between HVRP grant recipients and local Continuum of Care (Ware et al. 2011). In addition, the National Coalition for Homeless Veterans produced a best practice guide based on data from 31 high-performing HVRP grant recipients (National Coalition for Homeless Veterans 2012).

In 2016, DOL funded a formative evaluation of HVRP to understand and improve HVRP services (Trutko et al. 2016). The evaluation found that grant recipients relied heavily on their referral partners in response to grant recipients' limited resources. The evaluation also revealed that grant recipients screened and assessed veterans to ensure that participants would benefit from the limited services provided and successfully exit the program by the end of the grant year. The study also found that grant recipients were hesitant to provide extensive education and job training assistance because of difficulties with

participants' completion of training within the program year. The one-year period of performance for HVRP grants in place during the 2016 evaluation may have affected the extent and duration of services provided by HVRP grant recipients.

Despite the lack of an earlier HVRP impact evaluation, evidence from evaluations of other federal employment and training programs has shown that key program components of HVRP, particularly intensive case management, can improve participants' employment-related outcomes. For example, a meta-analysis found that people with more than one barrier to employment benefited from coordinated strategies across systems and flexible training strategies (U.S. Departments of Labor, Commerce, Education, and Health and Human Services 2014). In addition, a large, nationwide experimental study of the Workforce Investment Act (WIA) Adult and Dislocated Worker programs showed that intensive case management services (which also led to increased training) produced positive earnings gains (McConnell et al. 2021). The evaluation of the Job Corps program also found that the wide range of supportive services received in Job Corps centers, in addition to the receipt of training and education services, were important factors that led to earnings gains for its participants (Schochet et al. 2008).

Other programs designed to improve employment outcomes for veterans and adults experiencing homelessness have also found positive impacts on employment and earnings outcomes. For example, several studies of the Individual Placement and Support (IPS) employment service, a program for veterans with post-traumatic stress disorder, a risk factor for homelessness, found increases in employment ranging from 15 to 48 percentage points (Davis et al. 2012; Ottomanelli et al. 2014; Davis et al. 2018).

Further, a non-experimental study of LA's HOPE, a Los Angeles housing program funded by HUD and DOL that helps adults facing chronic homelessness and mental illness in their efforts to secure housing and employment, found positive impacts on employment outcomes (Burt 2007). In addition, a small study of 63 justice-involved veterans experiencing homelessness showed that the IPS employment service had a positive impact on employment rates after six months (LePage et al. 2021). Finally, an experimental evaluation of the National Career Coach Program, which offers intensive career coaching and financial incentives for working, found an impact of 12 percentage points on employment rates for veterans transitioning from the military (Bond et al. 2022).

C. Overview of the HVRP impact evaluation

The HVRP impact evaluation used a quasi-experimental comparison group design to compare key employment-related outcomes for HVRP participants with the outcomes of similar veterans experiencing homelessness who did not participate in HVRP. A gold-standard, randomized controlled trial was not feasible as veterans receive priority of service for DOL-funded employment and training services (U.S. Congress 2002). Thus, denying services to veterans assigned to the control group could have raised ethical concerns among program providers.

The HVRP and comparison samples came from the same local areas and therefore faced similar labor markets and service environments. Both HVRP participants and the comparison group members were enrolled in the Wagner-Peyser Employment Service such that the study assessed the additional impact of

HVRP beyond services available through the Wagner-Peyser Employment Service. The research questions, study outcomes, and analysis approach were pre-specified in an analysis plan available on DOL's website.[2]

1. Research questions

The primary goal of the impact evaluation was to measure the longer-term employment and earnings impacts of HVRP. We selected a limited set of outcomes before conducting the analysis to serve as confirmatory outcomes, which are used to test the main hypotheses. Pre-specifying the main hypotheses and confirmatory outcomes promotes research transparency and reduces the likelihood of spurious results that can arise from performing a large number of statistical significance tests.

The primary outcomes of interest for the evaluation capturing longer-term impacts (the confirmatory outcomes) were employment and earnings two years after program enrollment (Exhibit I.3). More specifically, the evaluation measured impacts on employment in the eighth quarter after program enrollment and impacts on average quarterly earnings in the seventh and eighth quarters after program enrollment (Exhibit I.3, rows C.1–C.2). Average earnings across the seventh and eighth quarters after program enrollment was chosen to reduce the influence of earnings volatility on the impact estimates, which was especially high after the onset of the COVID-19 pandemic (Edwards et al. 2022; Smith et al. 2021).

We also address several exploratory research questions, which do not test the main hypothesis but may provide useful context for interpreting the main findings. We describe the impacts over each of the first eight quarters after enrollment to examine how impacts changed over time (Exhibit I.3, rows E.1–E.2). Average employment and earnings over the first four quarters provide a summary measure of HVRP's shorter-term impacts (Exhibit I.3, rows E.3–E.4). We also report impacts on maximum job tenure as of the fourth and eighth quarters after program enrollment to assess whether HVRP impacted the extent to which participants found stable employment (Exhibit I.3, rows E.5–E.6).

In addition, the study examined the extent to which impacts differed for groups of HVRP participants and HVRP grant recipients. HVRP participants who enrolled before and after the onset of the COVID-19 pandemic had different experiences with HVRP services because of the remote work environment (Exhibit I.3, row E.7). In addition, the study assessed whether HVRP had larger or smaller impacts for groups of participants based on their characteristics at program entry (Exhibit I.3, row E.8). For example, the report shows whether HVRP had higher or lower impacts for younger participants compared to older participants. Finally, the study investigated whether different features of HVRP implementation were associated with higher or lower impacts on employment and earnings outcomes (Exhibit I.3, row E.9).

[2] https://www.dol.gov/agencies/oasp/evaluation/completedstudies/Homeless-Veterans-Reintegration-Program-Impact-Evaluation.

Exhibit I.3. Research questions for the impact study

Question number	Research question
Confirmatory research questions	
What was the impact of enrolling in both HVRP and the Wagner-Peyser Employment Service relative to enrolling in only the Wagner-Peyser Employment Service on:	
C.1	Employment in the eighth quarter after program enrollment?
C.2	Average earnings in the seventh and eighth quarters after enrollment?
Exploratory research questions	
What was the impact of enrolling in both HVRP and the Wagner-Peyser Employment Service relative to enrolling in only the Wagner-Peyser Employment Service on:	
E.1	Quarterly employment for each of the eight quarters after enrollment?
E.2	Quarterly earnings for each of the eight quarters after enrollment?
E.3	Average employment over the first through fourth quarter after program enrollment?
E.4	Average earnings over the first through fourth quarter after program enrollment?
E.5	Maximum job tenure during the four quarters after program enrollment?
E.6	Maximum job tenure during the eight quarters after program enrollment?
Did the impact of HVRP differ for:	
E.7	Individuals who began receiving HVRP services before and after the onset of the COVID-19 pandemic?
E.8	Individuals with different characteristics (age, gender, education level, recent employment experience, and county unemployment rate)?
E.9	HVRP grant recipients with different implementation features related to partnership strength, case management, and relationships with employers?

2. Data sources

To address the research questions, the study relied on administrative data collected from DOL, grant recipients, and states to identify treatment and comparison group samples. First, we collected data from DOL's Workforce Integrated Performance System (WIPS), which contains information on veteran status, homelessness, and HVRP and Wagner-Peyser program participation. The data also include demographic and location information that we used to construct weights for the comparison group so that the group's weighted characteristics would match those of the HVRP sample. To increase our accuracy in identifying HVRP participants, we combined the WIPS data with HVRP grant recipients' rosters from their Technical Performance Reports (TPR). To track participant outcomes, we merged our treatment and comparison samples with quarterly employment and earnings information from the National Directory of New Hires (NDNH). The merge required the use of personally identifying information, which we collected directly from 10 states and the District of Columbia. Details about these data sources appear in Chapter III and Section A of the appendix.

3. Sample description

The impact analysis includes veterans experiencing homelessness who received Wagner-Peyser employment services in the District of Columbia and the following states: Arizona, Florida, Georgia, Michigan, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, and Washington. These locations

agreed to provide the names and Social Security numbers (SSN) needed to obtain NDNH earnings and employment data. For more details on the process of obtaining these data, see Section B of the appendix.

HVRP participants in the impact analysis enrolled in HVRP between July 2019 and June 2021 (program year 2019 or program year 2020); those are the enrollment cohorts for which the study team was able to obtain employment and earnings data for three baseline quarters as well as for eight post-enrollment quarters.

The impact analysis sample consists of individuals who were classified in WIPS as veterans experiencing homelessness, which means the individuals lacked a fixed, regular, and adequate night-time residence (U.S. Department of Labor 2021).[3] HVRP serves both veterans experiencing homelessness and veterans at risk of homelessness.[4] However, during the impact analysis sample period, most grant recipients were required to limit the number of veterans at risk of homelessness who could enroll in HVRP to 10 percent of planned enrollments (National Veterans' Technical Assistance Center 2019).[5]

In Exhibit I.4, we present the characteristics of the 1,184 HVRP participants in the sample. Approximately half of the participants were middle-aged, with 52 percent of the sample between 40 and 59 years old. A large majority of the sample (91 percent) was male. Most participants were either White (44 percent) or Black (41 percent), and only 9 percent of the sample was Hispanic. Relatively few (12 percent) sample members had completed a bachelor's degree or higher. For most of the sample, many years had passed since their most recent year in the military, with only 23 percent having a military separation of fewer than 10 years.

Thirty-nine percent of participants had a disability, which in this study is classified as self-identification of a physical or mental impairment, or determination by the Department of Veterans Affairs of a service-connected disability. Twenty-one percent of the sample reported previous involvement with the justice system, defined in WIPS as an arrest or conviction for a crime. Eighteen percent of the sample reported receiving public benefits such as from the Supplemental Nutrition Assistance Program (SNAP), Supplemental Security Income (SSI), or Temporary Assistance for Needy Families (TANF).

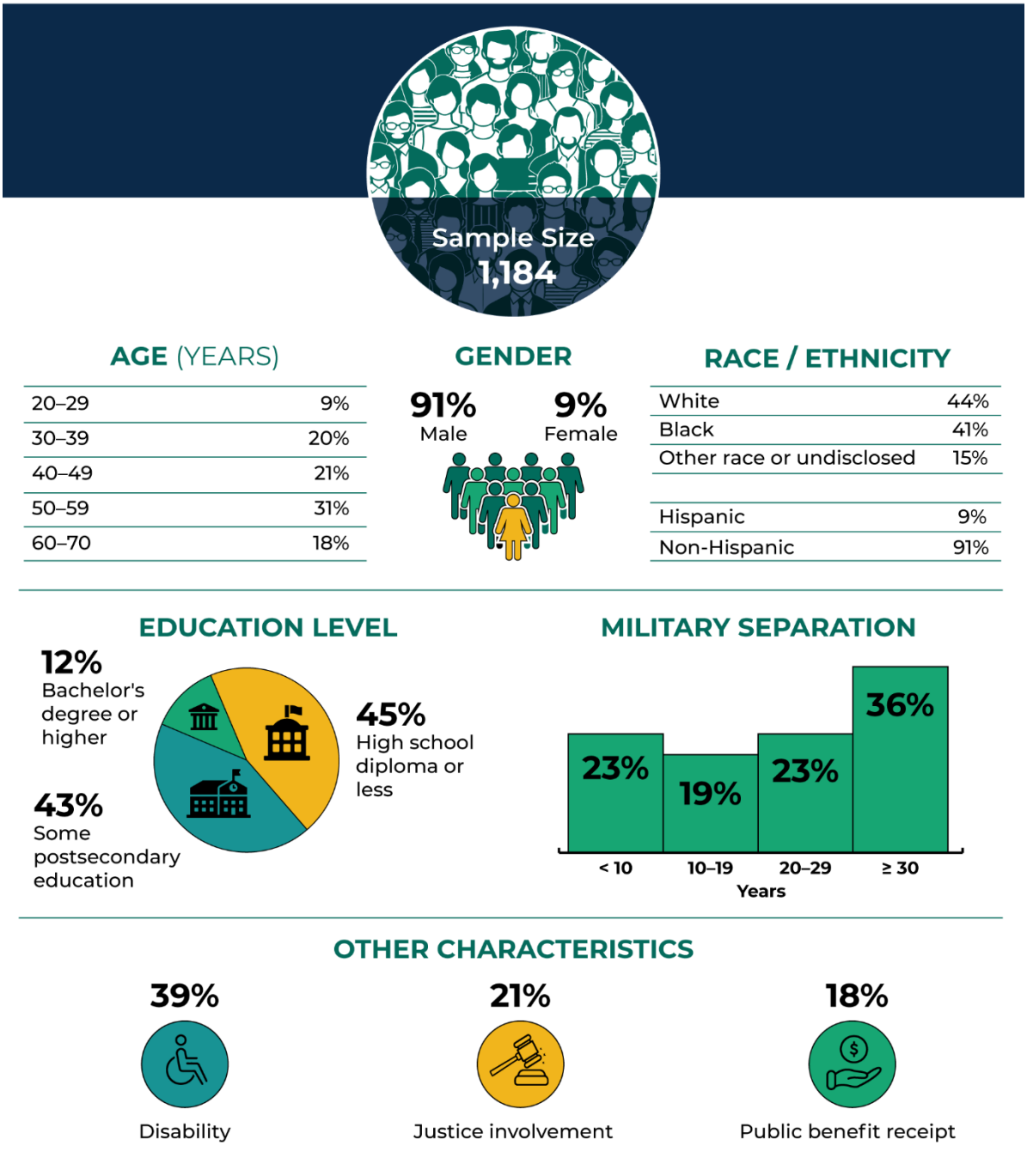
The sample is not nationally representative of all HVRP participants because it includes only participants who were co-enrolled in the Wagner-Peyser Employment Service and resided in the locations that agreed to provide data for the study. The demographic characteristics of HVRP participants in the impact analysis were similar to those of a nationwide sample of HVRP participants co-enrolled in the Wagner-Peyser Employment Service during program years 2019 and 2020, though HVRP participants in the nationwide sample were 3 percentage points more likely to be female and 3 percentage points more likely to be White compared to HVRP participants in the impact analysis (Appendix Exhibit A.3).

[3] The WIPS definition for veterans experiencing homelessness includes individuals primarily staying in a residence that is a publicly or privately operated shelter for temporary accommodation, as well as individuals staying in institutions that provide temporary residence for people intended to be institutionalized.

[4] For purposes of enrollment, veterans at imminent risk of homelessness (within 14 days of losing their housing) are classified as experiencing homelessness rather than at risk of homelessness.

[5] Starting in 2023, DOL changed the regulations guiding HVRP enrollments such that there are no limits on the number of veterans at risk of homelessness whom grant recipients can serve (U.S. Department of Labor 2023b).

Exhibit I.4. Characteristics of HVRP participants in the study



Notes: Veterans classified as having a disability were those who (1) self-identified as experiencing a physical or mental impairment that substantially limited one or more of their major life activities, consistent with the definition of "disability" in the Americans with Disabilities Act of 1990, or (2) received a determination of a service-connected disability per the Department of Veterans Affairs. "Justice involvement" refers to veterans who, before program entry, had been subject to the criminal justice system and arrested or convicted of a crime. Veterans receiving public benefits were those receiving SNAP, SSI, or TANF at the time of program entry.

SNAP = Supplemental Nutrition Assistance Program; SSI = Supplemental Security Income; TANF = Temporary Assistance for Needy Families.

D. Limitations

In this section, we describe some limitations of the HVRP impact evaluation that are helpful to note when interpreting the study results.

Given that 10 states and the District of Columbia agreed to provide the data needed to conduct the evaluation, the impact analysis sample is not nationally representative of all HVRP participants in program years 2019 and 2020. As noted, HVRP participants in the analysis sample had demographic characteristics similar to those of HVRP participants across the nation who enrolled in the Wagner-Peyser Employment Service. However, it is important to note that HVRP grant recipients can satisfy the requirement to co-enroll participants in programs at American Job Centers through programs other than the Wagner-Peyser Employment Service.[6] The results should therefore be interpreted as measuring the impacts of the HVRP grant recipients in study locations based on a sample of participants who co-enrolled in the Wagner-Peyser Employment Service.

The study team identified a comparison group that was similar to HVRP participants along several observable dimensions, including baseline demographics, employment, and earnings. In addition, comparison group members were similar to HVRP participants in that they were actively looking for jobs by enrolling in the Wagner-Peyser Employment Service and residing in counties served by HVRP. However, it is still possible that some unobservable differences in the HVRP participants and the comparison group related to employment and earnings outcomes could bias the impact results.

The analysis measures impacts on individuals who enrolled in HVRP between July 2019 and June 2021 (program years 2019 and 2020)—years that have important implications for two reasons. First, approximately half of HVRP participants in the sample began receiving services after the onset of the COVID-19 pandemic, and all HVRP participants and comparison individuals were exposed to volatile pandemic-era labor market conditions at some point during the study's follow-up period. As shown in Section IV.B, evidence suggests that impacts differed for individuals enrolling before and after the onset of the pandemic. The average impacts presented as the main findings in this report are therefore not representative of impacts during normal times when HVRP grant recipients and their partners provided fully in-person services and when labor market conditions were less volatile.

Second, as described previously, the funding model for HVRP changed during the study period from a one-year grant to a three-year grant. The shift may have changed the incentives surrounding performance measures related to rapid job placement for HVRP participants, potentially affecting the types of jobs to which HVRP participants were matched and the provision of job retention and career advancement supports. Given that the change to a three-year grant model took place in July 2020 when the COVID-19

[6] In the HVRP grantee survey administered as part of the implementation study, over 90 percent of grantee survey respondents reported that at least some of their participants received employment and training services at the American Job Center (Batko et al. 2022). However, only 42 percent of grant recipients reported that most or all of their HVRP participants received concurrent American Job Center services. Thirty percent of HVRP grant recipients reported that the majority of participants was enrolled in the Wagner-Peyser Employment Service, which is the group of participants of interest in the impact evaluation. Fifty-six percent of HVRP grant recipients reported that the majority of participants were co-enrolled in JVSG services, including services from Disabled Veterans' Outreach Program specialists and Local Veterans' Employment Representatives. Thirteen percent of HVRP grant recipients reported that the majority of participants were co-enrolled in WIOA Adult and Dislocated Worker Programs.

pandemic also affected service delivery, the study was not able to examine how the change in grant structure may have affected employment outcomes for HVRP participants.

Finally, in addition to connecting veterans experiencing homelessness to employment opportunities, HVRP grant recipients partner with federal, state, and local agencies to link veterans with housing and health services. The evaluation examines only HVRP's impact on employment and earnings outcomes because no national data on housing and health outcomes were available for the evaluation. In addition, it was not feasible for the evaluation to conduct a survey to collect such data. A survey would have been costly to implement and would likely have resulted in low response rates given the unstable contact information among the population of interest. The impacts described in this study therefore do not measure impacts on housing and health outcomes that HVRP may have influenced among veterans experiencing homelessness. Thus, the study does not necessarily account for HVRP's full benefits on participants' outcomes.

E. Structure of the report

The remainder of this report is structured as follows. In Chapter 2, we outline the Wagner-Peyser Employment Service and describe key findings from the HVRP implementation study that may be relevant for interpreting results from the impact study. In Chapter 3, we provide information about the design of the impact study and how we constructed the comparison group. We present, in Chapter 4, impacts on employment and earnings outcomes and then discuss our conclusions in Chapter 5. Additional details about the data, sample, and impact results appear in the appendix.

II. Understanding Program Context

We organize this chapter into two sections to provide context for the HVRP impact evaluation results. In the first section, we describe the Wagner-Peyser Employment Service, an American Job Center program in which both HVRP participants and comparison individuals were enrolled. The second section summarizes key findings from the HVRP implementation evaluation that are relevant for interpreting the patterns in the impact results.

A. The Wagner-Peyser Employment Service

Because all members of both the HVRP participant and comparison groups enrolled in the Wagner-Peyser Employment Service at an American Job Center, the impact analysis measures the added value of HVRP services beyond those received by veterans through the Wagner-Peyser Employment Service. Here, we present an overview of the Wagner-Peyser Employment Service to describe the services that members of the treatment and comparison group may have received through the program.[7] In the next section, we provide additional details about the types of services that HVRP participants and other veterans experiencing homelessness received at American Job Centers.

The Wagner-Peyser Act of 1933 established the nation's public employment offices, initially known as the Employment Service. The subsequent Workforce Investment Act (WIA) and WIOA instituted reforms that developed a one-stop service delivery system and ultimately led to the co-location of Employment Service staff in the nationwide American Job Center system.[8]

Wagner-Peyser Employment Service staff provide a range of services to job seekers, including:

- **Job search and placement services** such as counseling, labor market information, assessment, and referral to employers
- **Recruitment services for employers** to help fill vacancies
- **Rapid-response events** to assist workers who have received notice of layoffs due to technological change, impact of imports, or plant closures
- **Reemployment services** for individuals receiving unemployment compensation
- **Access to the state's labor exchange**, including open job orders

Employment Service staff, who are typically employed by the state's workforce agency, provide job seekers with basic career services, which are described as lighter-touch services that could include program eligibility determinations, skills assessments, labor exchange services, information sharing about other programs and services, and program referrals. In some states, Employment Service staff may also provide individualized career services, which may include specialized assessments, development of individual employment plans, and connections for job seekers to work experience (WIOA State Plan n.d.).

Services received by Wagner-Peyser participants vary across states. In Exhibit II.1, we present the percentage of Wagner-Peyser program participants receiving different levels of services in the impact

[7] The description in this section closely follows the description of the Wagner-Peyser Employment Service in Spitzer et al. (2023).

[8] https://www.dol.gov/agencies/eta/american-job-centers/wagner-peyser.

study states from April 2020 through March 2021. Almost all Wagner-Peyser participants received basic career services, which can include non–staff-assisted services such as registering in the state's labor exchange and the staff-assisted services described above. However, some states provided individualized career services to a larger share of Wagner-Peyser participants. For example, in Michigan and Virginia, over 75 percent of Wagner-Peyser participants received more individualized career services.

Although the Wagner-Peyser program focuses on career services, program participants can also partake of training funded through WIOA Title I. In Rhode Island, for example, over 15 percent of Wagner-Peyser participants took advantage of training, but Georgia, Michigan, and Oregon offered no training. As described in the next section, veterans enrolled in the Wagner-Peyser Employment Service also received other services at American Job Centers, including services from Disabled Veterans' Outreach Program (DVOP) specialists provided under the JVSG program.

In the impact study, to account for differences across states in the types of services received by Wagner-Peyser participants, we selected comparison individuals for each HVRP participant who resided in the same state as the HVRP participant.

Exhibit II.1. Percentage of Wagner-Peyser participants receiving each type of employment service among those who exited from services from April 2020 through March 2021, by impact study location

State	Basic career services	Individualized career services	Received training
Arizona	100.0	18.8	2.2
District of Columbia	100.0	22.4	5.8
Florida	100.0	36.6	4.5
Georgia	100.0	16.7	0.0
Michigan	100.0	78.2	0.0
Oregon	94.0	22.9	0.0
Rhode Island	100.0	48.4	16.4
South Carolina	100.0	45.8	7.1
Tennessee	100.0	31.6	4.3
Virginia	100.0	89.7	2.3
Washington	98.8	28.2	5.2

Source: Program Year 2020 Data Book Workforce Innovation and Opportunity Act and Wagner-Peyser, 2022. https://www.dol.gov/sites/dolgov/files/ETA/Performance/pdfs/PY%202020%20WIOA%20and%20Wagner-Peyser%20Data%20Book.pdf.

B. Key findings from the implementation study

In this section, we present a summary of five key findings from the HVRP implementation study that may be relevant for interpreting the results from the impact study. Additional details about the implementation study findings appear in the main implementation study report (Batko et al. 2022) and in a companion brief examining services received at American Job Centers by HVRP participants and other veterans experiencing homelessness (Johnson et al. 2022).

The main implementation study collected data through (1) a survey of all program year 2020 HVRP grant recipients, (2) semi-structured interviews with key stakeholders conducted during site visits to eight grant recipients and their community partners, and (3) in-depth interviews with veterans who received services from one of the eight site visit grant recipients (Batko et al. 2022). The data, which were collected between October 2020 and September 2021, reflected the experiences of grant recipients and veterans during the COVID-19 pandemic. The companion brief used WIPS data on services received by veterans experiencing homelessness between July 2019 and June 2021 (program years 2019 and 2020) (Johnson et al. 2022).

Key finding #1: HVRP grant recipients reported that HVRP helped veterans find jobs relatively quickly. Seventy-six percent of grantee survey respondents reported that the average HVRP participant was placed in a job within three months of enrollment. Site visit grant recipients reported that they placed HVRP participants in particular sectors and job types, such as warehouse and construction (including forklift operation) and the security, culinary, and commercial driving fields.

Key finding #2: Some HVRP participants reported that the jobs were not a great fit for their skills or interests. Fifty-four veterans participating in HVRP were interviewed as part of the implementation study. Twenty-one of the participants were employed, and, of those, 15 said that HVRP helped them find their job. The same 15 participants reported getting hired immediately, but 13 did not think that the positions were a great fit for their interests or needs. Two-thirds of the 15 participants reported that their job did not typically follow a 9-to-5 work schedule, and one-third reported challenging work conditions, including physically demanding manual labor or long work hours.

Key finding #3: HVRP grant recipients reported providing follow-up supports after job placement, with most supports provided for one year or less. Of the grant recipients surveyed, 27 percent provided follow-up services for six or fewer months, 51 percent provided follow-up services for seven to 12 months, and 22 percent provided follow-up services for more than 12 months. Nearly half of HVRP grant recipients (45 percent) reported maintaining monthly contact with HVRP participants after job placement, and 28 percent reported more frequent communication (biweekly or weekly).

Most commonly, HVRP case managers helped HVRP participants obtain and retain jobs by providing transportation assistance, creating job retention plans, and helping secure clothes or tools for work. HVRP case managers provided transportation assistance both before (89 percent of grant recipients) and after (74 percent of grant recipients) job placement. Transportation support included vouchers, such as metro cards and gas cards, and help in arranging pick-up or drop-off services. The next most-common type of assistance related to the acquisition of clothes or tools for work, which grant recipients provided both before (68 percent of grant recipients) and after (80 percent of grant recipients) job placement. HVRP grant recipients also helped participants develop job retention plans before (72 percent of grant recipients) and after (59 percent of grant recipients) job placement.

Key finding #4: HVRP grant recipients screened participants for work readiness. Forty-five percent of grantee survey respondents reported that they assessed veterans for job readiness before HVRP enrollment. If a site visit grant recipient did not consider a veteran ready for the job market, the grant recipient referred the veteran to other services to progress toward job readiness before HVRP enrollment.

The finding about work readiness is important to the impact study if barriers to employment, such as mental health and substance abuse challenges, prevented some veterans from enrolling in HVRP but not in the Wagner-Peyser Employment Service. The implications of such barriers could upwardly bias the impact estimates for HVRP if the variables that the study accounts for when identifying a comparison group, such as pre-entry employment and earnings, do not capture the dimensions of work readiness for which HVRP grant recipients screen. Section IV.C provides details about an additional analysis to assess the extent to which screening for work readiness may affect HVRP impact results.

Key finding #5: HVRP participants received services at American Job Centers for longer periods of time and received more of some types of services than other veterans experiencing homelessness who enrolled in the Wagner-Peyser Employment Service.

The median tenure of American Job Center enrollment, which represents the number of days a typical veteran experiencing homelessness was enrolled in the Wagner-Peyser Employment Service and received services, was 14 days longer for HVRP participants (22 days) than for other veterans experiencing homelessness (eight days) (Johnson et al. 2022). On average, HVRP participants received 7.3 distinct services compared to 6.7 distinct services for other veterans experiencing homelessness. HVRP participants were also particularly likely to receive some types of services: for example, HVRP participants were 31 percentage points more likely to receive services from a DVOP specialist (78 percent of participants) compared to other veterans experiencing homelessness (47 percent of participants).

DVOP specialists work directly with veterans to help them find employment and increase their earnings. They provide a range of services, including individualized career services, career guidance, job search assistance, and employment referrals. HVRP participants were more likely to receive all of these services from DVOP specialists compared to other veterans experiencing homelessness.

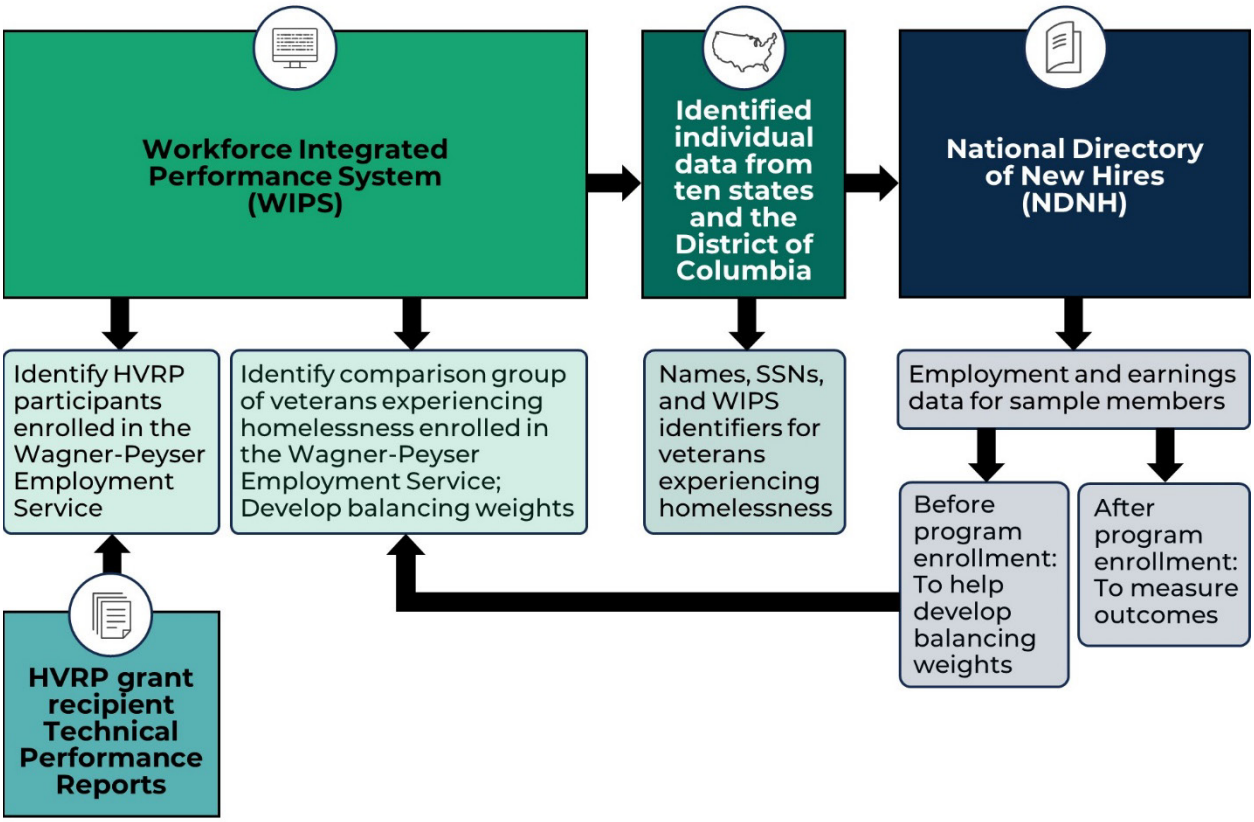
The reasons behind differences in service receipt are relevant for determining whether to account for such differences when measuring HVRP's impact. If the differences arose from HVRP staff efforts to encourage participants to enroll in additional services, then any impacts of those services on employment and earnings outcomes can be considered part of HVRP's impact. However, if the differences in service receipt arose from (1) the DVOP specialist's efforts to connect veterans experiencing homelessness to additional services and referring them to HVRP or (2) differences in some veterans' initiative in seeking out both HVRP and additional services at American Job Centers, then not accounting for differences in American Job Center services could bias the impact estimates. Section IV.C provides details about an additional analysis to assess the extent to which the HVRP impact results may be attributable to the higher rates of DVOP specialists' service delivery.

III. Impact Study Design

A. Data sources

The impact evaluation relied primarily on four data sources: (1) the Workforce Integrated Performance System; (2) Technical Performance Reports from HVRP grant recipients; (3) Social Security numbers provided by 10 states[9] and the District of Columbia; and (4) the National Directory of New Hires. In Exhibit III.1, we illustrate how we combined these data sources to inform the evaluation.

Exhibit III.1. Data sources used in the HVRP impact evaluation



SSN = Social Security number.

1. **Workforce Integrated Performance System.** WIPS is a database maintained by DOL's Employment and Training Administration that contains data on participants in all workforce programs funded by DOL, including the Wagner-Peyser Employment Service. WIPS data encompass information on demographics, service receipt, and program entry dates. We used the data to identify veterans experiencing homelessness who were Wagner-Peyser participants and resided in a county served by HVRP. We also used the data to describe the demographic characteristics of members of our sample and to measure services they received at American Job Centers. One limitation of these data is that, though WIPS also contains information on the industry of jobs held by participants before program

[9] The 10 states include Arizona, Florida, Georgia, Michigan, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, and Washington.

enrollment, the study team was not granted access to those variables for use in the HVRP impact evaluation.

2. **Technical Performance Reports.** HVRP grant recipient TPRs include rosters of HVRP participants with identifying information such as name, gender, and race and ethnicity. That information allowed us to identify HVRP participants, the grant recipient from which they received services, and quarter of enrollment in HVRP. Though WIPS data contain a variable capturing whether individuals participated in HVRP, early study design work showed that the variable contained inaccuracies. To improve the accuracy of the HVRP variable in WIPS, the study team merged WIPS data and TPRs to confirm the individuals enrolled in HVRP. Appendix Section A provides additional details.
3. **Social Security numbers from 10 states and the District of Columbia.** To match data from WIPS to employment and earnings data, we needed data on each participant's SSN. Workforce agencies in 10 states and the District of Columbia agreed to provide the study team with SSN data: Arizona, Florida, Georgia, Michigan, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, and Washington. For a detailed description of the process involved in working with the workforce agencies, see Section B of the appendix.
4. **National Directory of New Hires.** NDNH data include information collected through the Unemployment Insurance (UI) system to describe quarterly employment, earnings, and UI outcomes. The Office of Child Support Services, which is part of the Administration for Children and Families in the U.S. Department of Health and Human Services, maintains the NDNH. The Office of Child Support Services collects the data from state UI systems; therefore, the data exclude individuals who are self-employed or casually employed, such as day laborers or part-time helpers. We collected NDNH data on employment and earnings for our sample from three quarters before enrollment through eight quarters following enrollment.

For more information on these data sources, including the available variables and related time periods, see Section A of the appendix.

B. Impact study sample

All members of the sample were veterans experiencing homelessness who enrolled in the Wagner-Peyser Employment Service at American Job Centers. To increase the similarity of the labor markets experienced by the HVRP impact study sample and the comparison group, we further restricted the comparison group to individuals residing in counties served by the HVRP grant recipients in the analysis. The HVRP impact study included 1,184 HVRP participants and 2,523 comparison individuals and represented 42 of the 226 active HVRP grant recipients during program years 2019 and 2020.

HVRP participants could have received Wagner-Peyser services before or after receiving HVRP services. In our sample, about 70 percent of HVRP participants enrolled in both HVRP and Wagner-Peyser services in the same quarter, 12 percent enrolled in Wagner-Peyser Employment Services before enrolling in HVRP, and 18 percent enrolled in Wagner-Peyser after enrolling in HVRP. For HVRP participants in the impact analysis, we set their starting quarter as the first quarter in which they enrolled in HVRP (rather than the first quarter in which HVRP participants began receiving Wagner-Peyser services) because the study goal was to measure HVRP's impacts on participants' labor market outcomes.

To help understand differences between the HVRP participant and comparison groups, we compared the unweighted characteristics of the two groups (Appendix Exhibit A.5). Broadly speaking, the two groups were similar, which may be expected given that all individuals were classified in WIPS as veterans experiencing homelessness. However, the two groups did exhibit some differences in characteristics. For example, HVRP participants were somewhat more likely to be Black and have lower levels of education. HVRP participants were also less likely to be female, although both groups were overwhelmingly male. In the three quarters before enrollment, HVRP participants had lower levels of earnings and employment.

As described in the next section, to account for observable differences between the treatment and comparison groups, we used inverse probability weights to weight the comparison group to reflect the characteristics of the treatment group. This approach aligned the two samples to improve the credibility of the impact findings relative to an analysis comparing the HVRP group to the full, unweighted comparison sample.

C. Constructing a comparison group

The goal of the impact study was to provide causal impact estimates of HVRP on participants' earnings and employment outcomes. To that end, we relied on a "selection-on-observables" assumption that participation in HVRP was effectively random once we accounted for observed characteristics related to both program participation and the outcomes of interest (Imbens 2004). We created a comparison group that was as similar as possible to the HVRP participants by applying inverse probability weights (IPW), which assigned greater weight to potential comparison group members who were more similar to HVRP participants than to those less similar (Horvitz and Thompson 1952). We calculated IPWs by using a "propensity score" (Rosenbaum and Rubin 1983) that estimated the likelihood of an individual's participation in HVRP based on pre-enrollment characteristics. The use of IPWs in non-experimental designs has been shown to perform well in real-world settings when there is strong overlap of the propensity score across the treatment and comparison groups (Busso et al. 2014; Huber et al. 2013).

After calculating the IPWs, we applied an additional weighting adjustment to ensure the number of weighted comparison individuals was the same as the number of HVRP individuals in a given state and year-quarter of entry (see Section D in the appendix for additional details). In view of the pandemic, we ensured perfect balance on the timing of program enrollment because of disruptions in the job market and HVRP services during the study period. In addition, we ensured perfect balance on the state of residence to prevent bias from differences across states in labor market conditions and service environments. We also explored the feasibility of obtaining perfect balance on the county of residence, instead of state, to make comparisons within the same local labor markets. However, we found that many HVRP participants would have few or no potential comparison individuals within the same county and year-quarter of entry. For example, 28 percent of HVRP participants had one or zero potential comparison individuals in the same county and year-quarter of entry.

We estimated propensity scores by using a logistic regression model in which the dependent variable was a binary indicator of HVRP participation and the independent variables included pre-enrollment employment and earnings, demographic characteristics, and county characteristics (see Exhibit A.5 in the appendix for a detailed list of variables). We explored several approaches to selecting the variables to include in the propensity score model. First, we chose variables based on theoretical relevance.

Second, we explored whether the model generated greater balance by using data-driven techniques that selected from a large set of potential interactions between the theoretically relevant variables. We discuss these two steps below.

Researcher selection of variables. We chose a set of pre-enrollment employment and earnings measures, demographic characteristics, and county characteristics that are likely relevant to HVRP participation and later labor market outcomes. These measures came from NDNH, WIPS, and the 2018 American Community Survey, respectively. It was important to model the influence of these variables in predicting participation in HVRP because individuals seeking employment assistance are likely to do so based on their recent experiences in the labor market, and these experiences may reflect their skills and readiness as they seek to improve their employment outcomes. The WIPS data further provided a rich set of demographic characteristics and variables that captured individual circumstances of veterans experiencing homelessness and are related to program participation and employment outcomes, such as whether a veteran had a disability or previous involvement with the justice system. Last, in recognizing the importance of modeling the local context in which program participants sought services and employment opportunities, we were motivated to include county characteristics in the propensity score calculations. In Exhibit III.2, we present the full list of variables selected for the analysis.

Identifying variable interactions. We used the least absolute shrinkage and selection operator (LASSO) method to identify additional variables interacted with one another that are predictive of eighth-quarter employment and participation in HVRP. This approach searches over a large set of variable interactions, in addition to the main variables, to identify those that best predict participation in HVRP subject to a regression penalty for over-fitting (Tibshirani 1996). Specifically, we used a double-selection LASSO to identify additional variable interactions to include in the propensity score model by using the union of variables selected by LASSO that are predictive of the outcome and HVRP participation (Belloni et al. 2014). For a list of interaction terms selected by the model, see Section D of the appendix.

Choosing between matching approaches. In addition, we explored whether matching techniques other than the IPW approach produced a comparison group that looked more like HVRP participants. We used nearest-neighbor matching (with replacement) and caliper matching on the estimated propensity score. In both approaches, we matched HVRP participants to comparison group members in the year-quarter and state to ensure balance on these dimensions. Nearest-neighbor matching (with replacement) paired HVRP participants with comparisons with the closest propensity score. Caliper matching selected a set of comparisons with propensity scores within a given distance of the propensity scores of HVRP participants.

The goal of exploring alternative methods for constructing the comparison group was to identify the approach that results in the best balance between the HVRP and comparison groups. We used several metrics to assess the performance of different approaches. First, we calculated effect size differences for key variables, which is the difference in means between HVRP participants and the weighted or matched comparison group, divided by the standard deviation.[10]

[10] Specifically, we divide by the pooled standard deviation, which is a weighted average of the standard deviations in the HVRP and comparison groups.

Second, we evaluated the overlap in propensity scores by plotting the distribution of scores for the HVRP and comparison groups and by calculating the Bhattacharyya coefficient, which measures the similarity of two distributions (Bhattacharyya 1943). Strong overlap can improve the similarity of the two groups and precision of impact estimates.

Finally, we constructed prognostic scores by using the control group to predict the confirmatory outcomes—employment and earnings—with the same variables as in the propensity score models. The prognostic scores were the predicted values from this prediction model, which we calculated for both the HVRP and comparison groups. We assessed the similarity of the prognostic scores across the two groups. Using prognostic scores to assess balance can help reduce bias in studies that rely on propensity scores (Stuart et al. 2013).

We found that estimating propensity scores using variables selected by double-selection LASSO and applying IPWs produced the strongest balance on key variables using our balancing metrics. For more detail about the relative performance of different approaches for obtaining a balanced sample, see Section D of the appendix.

D. Sample balance

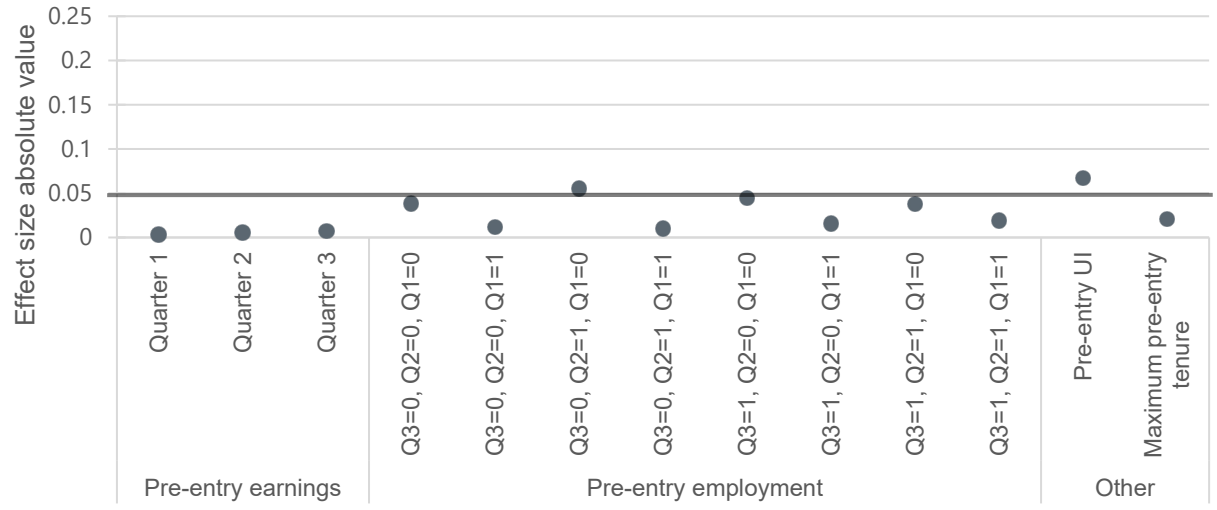
As described in the previous section, we assessed covariate balance by analyzing the effect size differences across key variables, providing a measure of the magnitude of differences across the HVRP and comparison groups on a common scale across variables. We followed research guidelines in interpreting effect sizes of less than 0.25 in absolute value as indicating sufficient balance for establishing baseline equivalence and effect sizes of less than 0.05 in absolute value as indicating very strong balance.[11]

In Exhibit III.2, using our primary approach for constructing the comparison group, we present the absolute value of effect sizes across all key variables. We found that the weighted comparison group resembled HVRP participants on relevant characteristics. The groups were strongly balanced on baseline employment and earnings measures as well as on demographic characteristics (Exhibits III.2.a and III.2.b), as only two variables had an absolute effect size slightly above 0.05, and no differences were statistically significant (see Exhibit A.5 of the appendix for a full list of effect sizes and corresponding *p*-values). Effect sizes were somewhat greater in magnitude for county characteristics (Exhibit III.2.c) but remained less than 0.25 in absolute value. HVRP participants resided in counties with poverty rates 0.4 percentage points higher on average than those in the counties where the comparison group resided and where unemployment rates were 0.1 percentage points higher on average. All other differences in county characteristics were not statistically significant (Appendix Exhibit A.5). As described in the following section, when estimating impacts, we included all these variables in the models to account for the small remaining differences between HVRP participants and the comparison group.

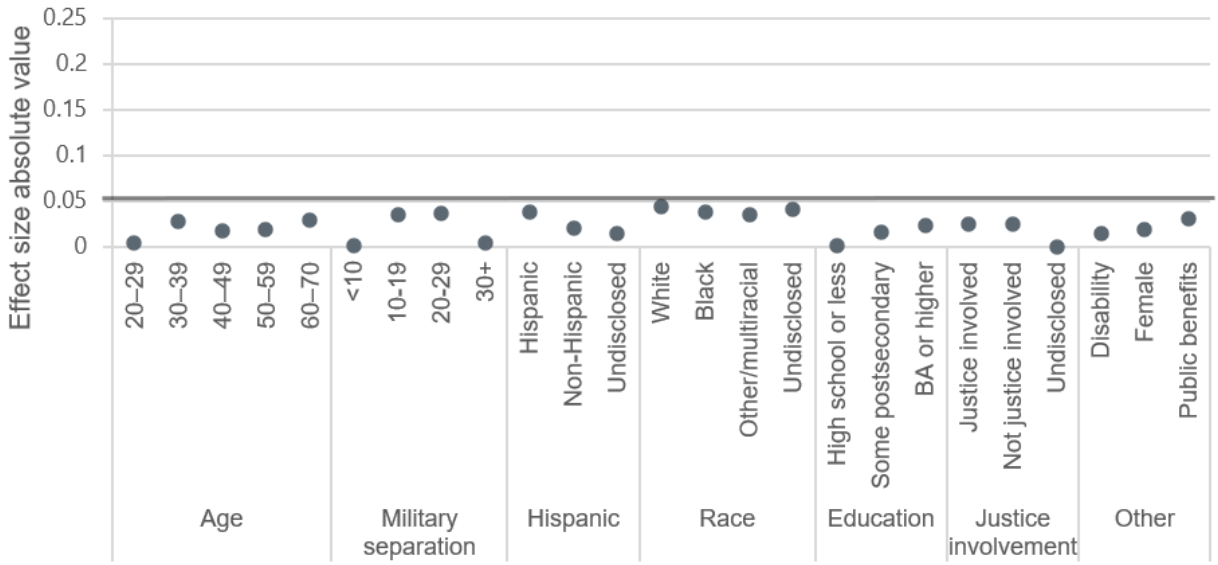
[11] The Clearinghouse for Labor Evaluation and Research Causal Evidence Guidelines (2022) asserts that, if effect sizes exceed 0.05 and are statistically significant, regression analysis should control for the corresponding variable. The What Works Clearinghouse (2022) stipulates that baseline equivalence can be established, provided that absolute effect sizes are lower than 0.25 standard deviations. Effect sizes exceeding 0.25 standard deviations are considered to indicate poor balance, and studies with such imbalance do not meet evidence standards for quasi-experimental research designs according to the What Works Clearinghouse.

Exhibit III.2. Effect sizes in absolute values for characteristics of HVRP participants relative to weighted comparison group

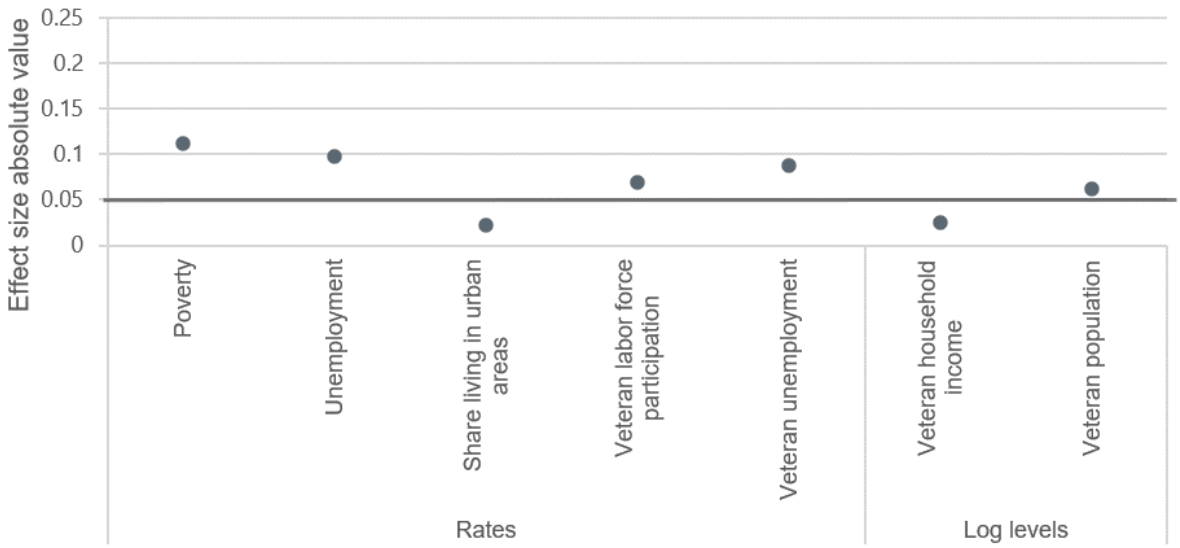
III.2a. Pre-entry employment and earnings characteristics



III.2b. Demographic characteristics



III.2c. County characteristics



Source: NDNH data matched to WIPS data. County characteristics come from the 2018 American Community Survey.

Notes: We constructed the comparison group by using our primary approach, that is, using inverse probability weights calculated from propensity scores modeled by using LASSO-selected covariates. Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings for the full sample of individuals. We calculated the effect size by dividing the difference in means between HVRP participants and the comparison group by the pooled standard deviation. Effect sizes less than 0.25 in absolute value indicate sufficient balance for establishing baseline equivalence, and effect sizes less than 0.05 in absolute value indicate very strong balance. The sample includes 1,179 HVRP participants and 2,462 comparison group members.

Q = quarter; UI =unemployment insurance.

E. Methods for estimating impacts

We estimated the impacts of HVRP on earnings, employment, and job tenure outcomes using linear regression models applying inverse probability weights.[12] The models included as covariates the same set of non-interacted predictors used to estimate the propensity scores. This "doubly-robust" strategy ensured unbiased estimates if either the propensity score model or regression model were correctly specified and it has been found to perform well under a range of circumstances (Busso et al. 2014; Huber et al. 2013). The regression models also included indicators for the combined state and year-quarter in which individuals enrolled in HVRP (for the treatment group) or the Wagner-Peyser Employment Service (for the comparison group). For more details about the regression model, see Section E of the appendix.

The estimated impacts represent the average effect of HVRP on program participants in the sample, also known as the average treatment effect on the treated. We estimated heteroskedasticity-robust standard errors to account for differences in the variability of employment and earnings outcomes across individuals. Given that differences in local labor market conditions may cause the correlation of individual outcomes within a county, we also estimated standard errors clustered at the county level as a sensitivity check.

[12] When estimating impacts on earnings we included individuals with zero earnings in the sample. This prevents bias in the estimated impacts on average earnings that would arise from including only employed individuals in the analysis, and results in a consistent sample of individuals across quarters and across the earnings, employment, and job tenure outcomes.

To assess the sensitivity of our estimates to design decisions, we also estimated impacts by using alternative approaches. Specifically, instead of relying on inverse probability weighting, we estimated impacts by using nearest-neighbor and caliper matching to construct the comparison group. For more details about these alternative approaches, see Section E of the appendix.

Finally, we estimated group- and grant recipient-specific impacts by adding interaction terms to the regression model. We present details about the group-specific findings in Section IV.B and details about the grant recipient-specific findings in Section IV.D.

IV. Impacts on Employment, Earnings, and Job Tenure

In this chapter, we compare employment and earnings outcomes of HVRP participants and the weighted comparison group during the eight quarters following program enrollment. We present, first, the full sample findings for confirmatory outcomes that focus on longer-term HVRP impacts and, second, the exploratory outcomes that examine the full two-year follow-up period. We next present group-specific findings for two groups of HVRP participants: (1) those defined by the date of enrollment in services and (2) those defined by baseline demographic and local area characteristics. Then, we explore potential sources of bias and model misspecification through sensitivity analyses. Finally, we explore grant recipient-specific impacts and their relationships with program features. The research questions posed in this section appear in Exhibit I.2.

A. Impacts for the full sample

1. Confirmatory outcomes

We find no statistically significant effects of HVRP on the study's prespecified confirmatory outcomes: employment and earnings in the seventh and eighth quarters after program enrollment (Exhibit IV.1). The estimate of HVRP's impact on eighth-quarter employment was 1.5 percentage points, which is not statistically significant at the 5 percent level. In the eighth quarter, 45.6 percent of the HVRP group was employed, compared to 44.1 percent of the weighted comparison group.

The impact estimate for average earnings over the seventh and eighth quarters was also not statistically significant at the 5 percent level (Exhibit IV.1). During this period, the HVRP group earned $3,222 per quarter on average and the weighted comparison group earned $3,541 per quarter on average, for a difference of negative $319 that was not statistically significant. To understand more fully the evolution of employment and earnings that led to these null impacts, we turn to exploratory analyses of quarterly HVRP impacts over the full follow-up period.

Exhibit IV.1. Impact of HVRP participation: Confirmatory outcomes

Outcome	HVRP group mean	Comparison group mean	Impact estimate	Standard error	*p*-value
Employment eight quarters after program enrollment	0.456	0.441	0.015	0.019	0.42
Average earnings in the seventh and eighth quarters after program enrollment	$3,222	$3,541	-$319	$205	0.12

Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. We calculated the HVRP group mean by adding the impact estimate to the comparison group mean. For a detailed description of estimation methods, see the appendix. The sample includes 1,179 HVRP participants and 2,462 comparison group members. Neither of the impact estimates in this table are statistically significant at the 0.05 level.

2. Employment impacts over the full follow-up period

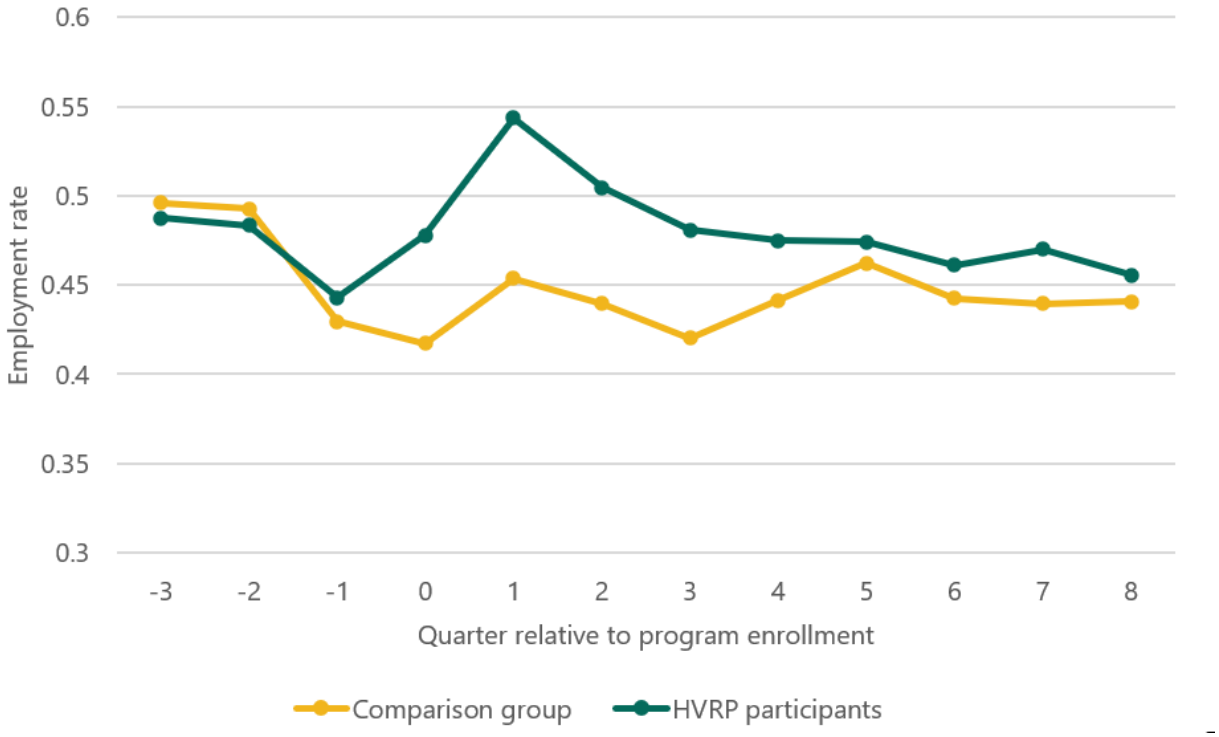
We next analyze how HVRP impacted employment in each quarter following program enrollment. An examination of employment rates across the HVRP and weighted comparison group shows that HVRP participants had employment histories similar to those of the comparison group before program

enrollment, providing additional evidence in support of the study design (Exhibit IV.2). Both groups experienced a decline in employment leading up to program enrollment, which is expected as a motivation for seeking services and is commonly observed in evaluations of employment and training programs (Ashenfelter 1978). Employment among HVRP participants rose from the time of program enrollment and fell back to pre-program levels by the beginning of the second year after enrollment. In contrast, the comparison group maintained steady employment rates over the follow-up period.

These employment patterns translated into statistically significant impacts on employment during the quarter of enrollment and the following three quarters (Exhibit IV.3). HVRP participants were 6 percentage points more likely to be employed than comparison group members in the quarter of program enrollment and 6 to 9 percentage points more likely to be employed in the first three quarters following enrollment. The effects dissipated in the fourth quarter and stabilized around a statistically insignificant 2 percentage points throughout the program's second year.

This pattern of employment impacts is consistent with findings from the implementation study, with HVRP grant recipients reporting that they helped participants find jobs quickly and delivered program services primarily during the first year after job placement. The finding that the positive employment impacts did not persist is also consistent with reports from HVRP participant interviews that job placements were not always desirable and perhaps contributed to job turnover.

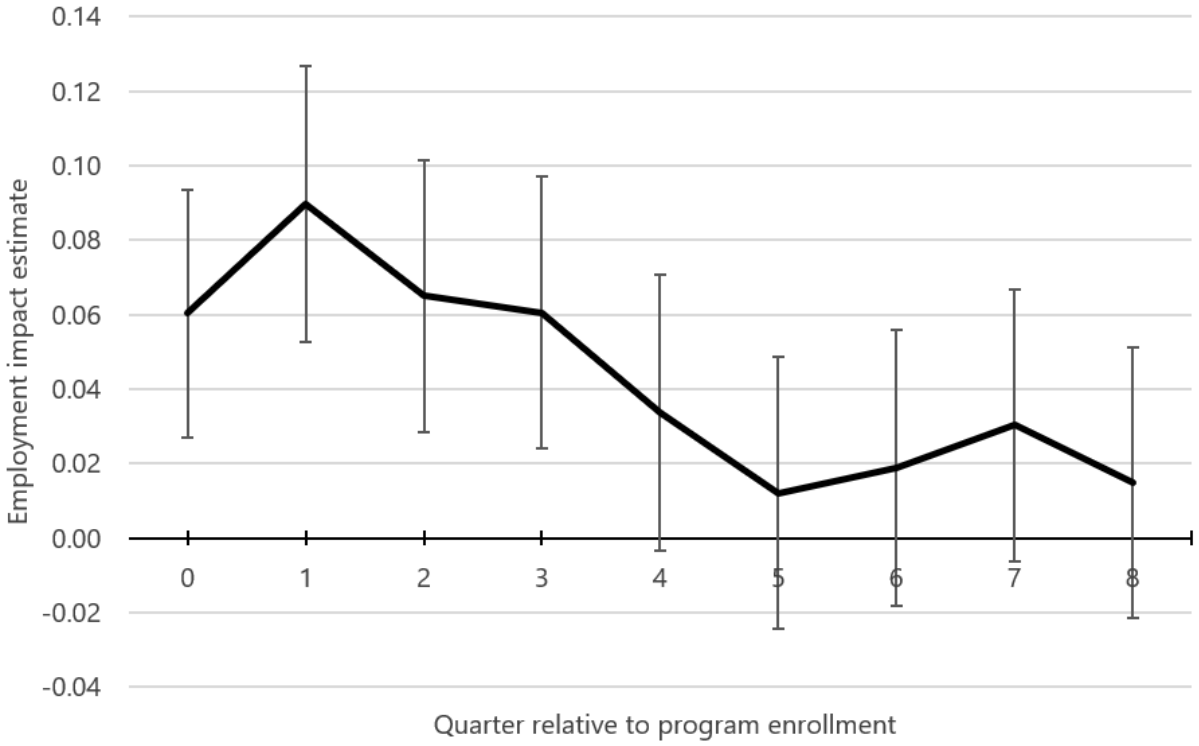
Exhibit IV.2. Quarterly employment rates of HVRP participants and comparison group members



Source: NDNH data matched to WIPS data. Data cover the period from September 2018 (2018Q4) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter. We calculated the comparison group employment rate by applying inverse probability weights. The employment rate for HVRP participants is the comparison group rate plus the estimated HVRP impact.

Exhibit IV.3. Impacts of HVRP participation on quarterly employment



Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter. The black line represents the impact estimate in each quarter. Error bars represent the 95 percent confidence interval. Impacts are estimated separately for each quarter. For a detailed description of estimation methods, see the appendix. The sample includes 1,179 HVRP participants and 2,462 comparison group members.

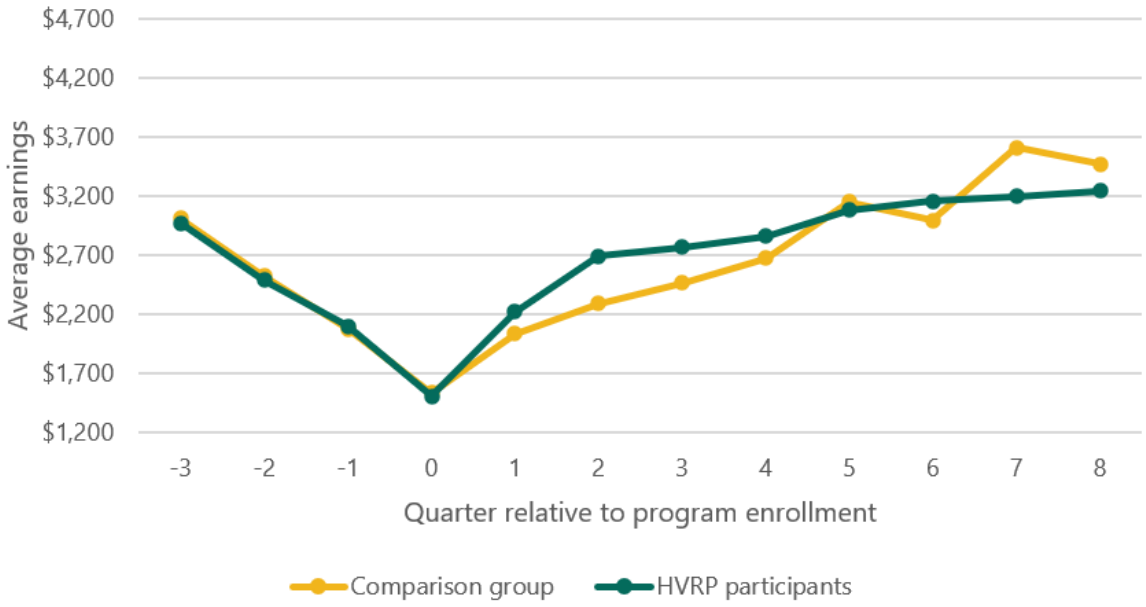
3. Earnings impacts over the full follow-up period

In Exhibit IV.4, we display the trajectory of quarterly earnings for the HVRP and comparison groups during the pre- and post-enrollment periods. In the three pre-enrollment quarters, average earnings of HVRP participants and comparison group members were similar, declining from a high of about $3,000 three quarters before enrollment to a low of about $1,500 in the quarter of enrollment. Earnings continued to decline in the quarter of program enrollment for both groups, even though we saw the employment rate for the HVRP group increase during the quarter of program enrollment. This finding is consistent with HVRP participants finding jobs later in the quarter of program enrollment, such that we did not observe increases in earnings until the following quarter.

After program enrollment, HVRP participants appear to have initially experienced faster growth in earnings than did comparison group members. Earnings growth continued for HVRP participants, but the pace of growth slowed by the fourth quarter. This pattern closely follows changes in employment of HVRP participants during this period, suggesting that the increase and subsequent slowdown in earnings growth is likely due to the concurrent increase and subsequent decrease in employment. The comparison group experienced a sharp increase in average earnings in the seventh quarter following program enrollment.

We found positive earnings impacts of about $400 and $300 in the second and third quarters after program enrollment, respectively; both impacts are statistically significant (Exhibit IV.5). Average earnings for HVRP participants were also higher than those of comparison group members in the first and fourth quarters following program enrollment, but the differences were not statistically significant. Average earnings for HVRP participants were lower than those of comparison group members in the seventh and eight post-enrollment quarters but the differences were also not statistically significant. In Section IV.B we report impacts separately for individuals enrolling in HVRP before and after the onset of the COVID-19 pandemic, and show that the negative estimated impacts in the seventh and eight post-enrollment quarters were driven by individuals enrolling after the onset of the pandemic.

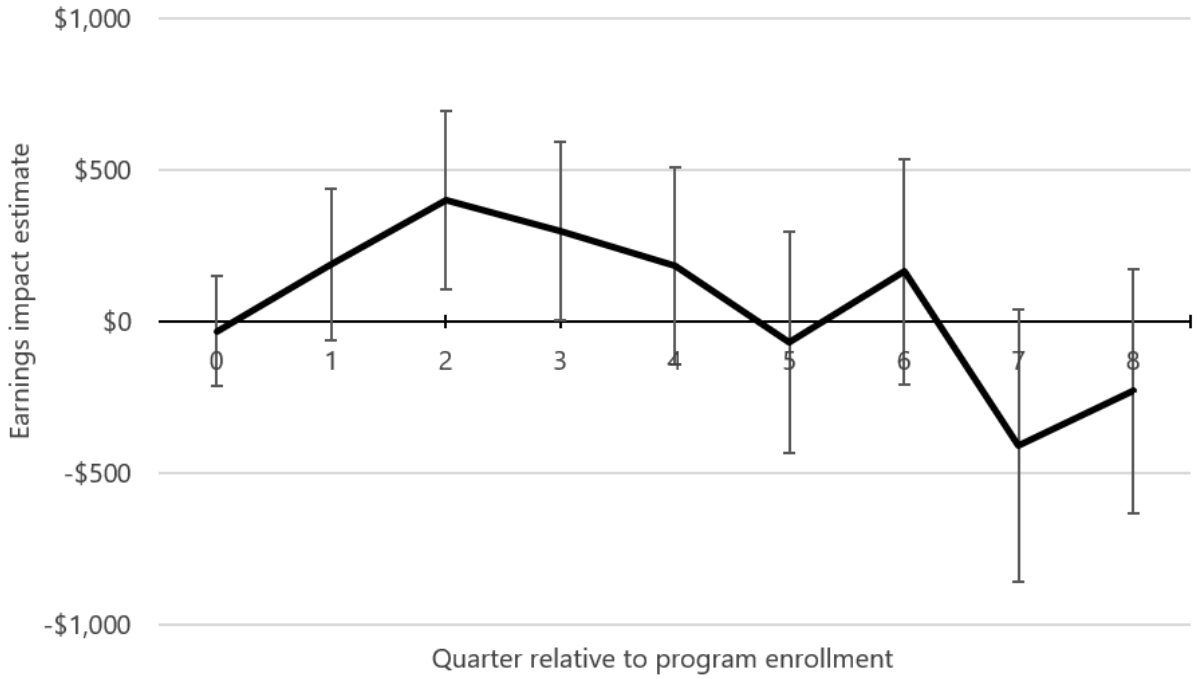
Exhibit IV.4. Average quarterly earnings of HVRP participants and the comparison group



Source: NDNH data matched to WIPS data. Data cover the period from September 2018 (2018Q4) to June 2023 (2023Q2).

Notes: Individuals with zero earnings are included in the calculations to measure average earnings for the full sample of individuals. We calculated the comparison group's average earnings by applying inverse probability weights. The average earnings of HVRP participants are equal to the comparison group's average plus the estimated HVRP impact.

Exhibit IV.5. Impacts of HVRP participation on quarterly earnings



Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. The black line represents the impact estimate in each quarter. Error bars represent the 95 percent confidence interval. Impacts are estimated separately for each quarter. For a detailed description of estimation methods, see the appendix. The sample includes 1,179 HVRP participants and 2,462 comparison group members. The third quarter impact estimate is statistically significant at the 5 percent level.

4. Summary of first-year employment and earnings impacts

To summarize employment impacts over the first year, we estimated the impact of HVRP on average quarterly employment over quarters one through four following program enrollment, which was equal to 6.2 percentage points (Exhibit IV.6). Similarly, we estimated the impact of HVRP on average quarterly earnings over the first year following program enrollment to be $267 per quarter. Both impacts were statistically significant.

We can compare the relative size of earnings and employment impacts using the effect size, which scales impacts by the standard deviation of the outcome. In the first year of the program, employment impacts translated into an effect size of 0.15 standard deviations, and earnings impacts into a smaller effect size of 0.08 standard deviations.[13]

[13] We calculated the effect size of first-year employment impacts by dividing the impact estimate of 0.062 by the pooled standard deviation of 0.41. We calculated the effect size of first-year earnings impacts by dividing the impact estimate of $267 by the pooled standard deviation of $3,515.

Exhibit IV.6. Impacts of HVRP participation: Exploratory outcomes

Outcome	HVRP group mean	Comparison group mean	Impact estimate	Standard error	*p*-value
Average employment in the first year (first through fourth quarter) after program enrollment	0.501	0.439	0.062**	0.015	0.00
Average earnings in the first year (first through fourth quarter) after program enrollment	$2,635	$2,368	$267*	$123	0.03
Longest job tenure in the first year (first through fourth quarter) after program enrollment	1.62	1.45	0.167**	0.053	0.00
Longest job tenure in the two years (first through eighth quarter) after program enrollment	3.22	3.14	0.081	0.112	0.47

Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. Job tenure is defined as the number of consecutive quarters an individual was employed by the same employer. We calculated the HVRP mean by adding the impact estimate to the comparison group mean. For a detailed description of estimation methods, see the appendix. The sample includes 1,179 HVRP participants and 2,462 comparison group members.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

5. Impacts on job tenure

To understand more fully the stability of employment attained by program participants, we also estimated impacts on job tenure. Job tenure is defined as the number of consecutive quarters an individual was employed with the same employer. We examined the longest job tenure an individual attained in the first year and in the two years following program enrollment. This examination furthers our understanding of program impacts on labor market outcomes and recognizes that, even in the absence of employment effects, HVRP services could have improved employment stability by placing participants in more permanent positions.

The longest job tenure attained by HVRP participants was greater in the first year of the program, but by the end of the second year, it was similar to that of the comparison group (Exhibit IV.6). This is likely due to HVRP participants' higher employment rates in the first year following program enrollment, which would provide a greater opportunity to gain tenure with the same employer over that time. Specifically, the longest time spent with the same employer in the first four quarters following program enrollment was 0.167 quarters (or about two weeks) longer for HVRP participants, or 11.5 percent longer than for the comparison group mean (Exhibit IV.6). This estimated impact is statistically significant at the 5 percent level. After two years, the longest job tenure for HVRP participants was closer to that of the comparison group, with the difference not statistically significant.

6. Discussion

The findings from the above analyses should be interpreted in the context of the program and study setting. Below, we discuss several factors that provide context for the results.

The COVID-19 pandemic caused volatility in the labor market and disrupted HVRP services. About half of participants in the sample enrolled in the program after the onset of the COVID-19 pandemic. Regardless of program enrollment timing, all individuals in the sample were exposed to volatile pandemic-era labor markets at some point during the study's follow-up period. Labor market conditions could have depressed employment and earnings outcomes for both HVRP participants and comparison group members during the follow-up period.

Findings from the implementation study suggest that the pandemic caused significant service disruptions and altered participants' experiences. Grant recipient interviewees noted that the shift from in-person to virtual service delivery adversely affected partnerships and referrals for several months (Batko et al. 2022). Disruptions to program delivery during this time could therefore have reduced program impacts. Later in the chapter, we explore how HVRP impacts varied by timing of later program enrollment.

Grant recipients provided follow-up HVRP services primarily in the first year after job placement but not in the second year. We learned from the implementation study that only about 22 percent of HVRP grant recipients surveyed for that study provided follow-up services beyond the first year after job placement (Batko et al. 2022). This may explain in part why positive impacts in the first year do not persist in the second year following enrollment.

The job fit for some HVRP participants was poor. Of employed HVRP participants interviewed, the majority said that their job placements were not a good fit for their interests or circumstances (Batko et al. 2022). Poor job match could have motivated HVRP participants to leave their jobs after a few quarters, leading to impacts that dissipated by the second year after enrollment.

The comparison group also had access to a rich set of services. The comparison group of veterans experiencing homelessness was eligible for a suite of employment and training programs aside from HVRP services. Findings from Johnson et al. (2022) indicate that non-HVRP veterans experiencing homelessness received about 6.7 distinct services on average at American Jobs Centers, compared to 7.3 distinct services for HVRP participants. It is possible that the non-HVRP services accessed by the comparison group improved outcomes for comparison group members and limited the size of the HVRP effects.

B. Group-specific analyses

In this section, we present findings from analyses of how HVRP impacts varied across groups of HVRP participants. We analyzed impacts for two types of groups: (1) those defined by the date they enrolled in services and (2) those defined by baseline demographic and local area characteristics. The first analysis sheds light on whether HVRP impacts varied for those who enrolled after the shift to remote work occasioned by the COVID-19 pandemic. The second set of analyses informs whether HVRP impacts varied with individual or local area characteristics.

We estimated group-specific impacts by including terms in the regression model that interacted group indicators with the indicator for HVRP participation. This approach generated impact estimates by making within-group comparisons. For example, we generated an impact estimate for female participants by comparing female HVRP participants to females in the comparison group. For more details about the specific regression models used, see Section E of the appendix.

We interpret these analyses as exploratory for two reasons. First, we calibrated the regression weights to create balance across the HVRP and comparison group members in the overall sample, but not necessarily within groups. For example, we did not run separate models for females to develop IPW weights directly for females in the comparison group. Second, we based the group-specific analyses on smaller sample sizes; therefore, larger differences would be needed to detect statistically significant impacts. We make note of the smaller sample sizes when presenting the results of these analyses.

We conducted joint tests of equality for all group-specific impacts to assess whether there were differences in impacts across groups. For example, dividing the sample by education level resulted in three groups: high school or less, some postsecondary education, and a bachelor's degree or higher. The joint test assessed whether the impact estimates for all three groups were equal. If the test rejected the hypothesis of equal impacts (indicated by a *p*-value less than 0.05) for all three groups, we considered the differences in impact estimates to be statistically significant.

1. Timing of enrollment in relation to COVID-19 pandemic

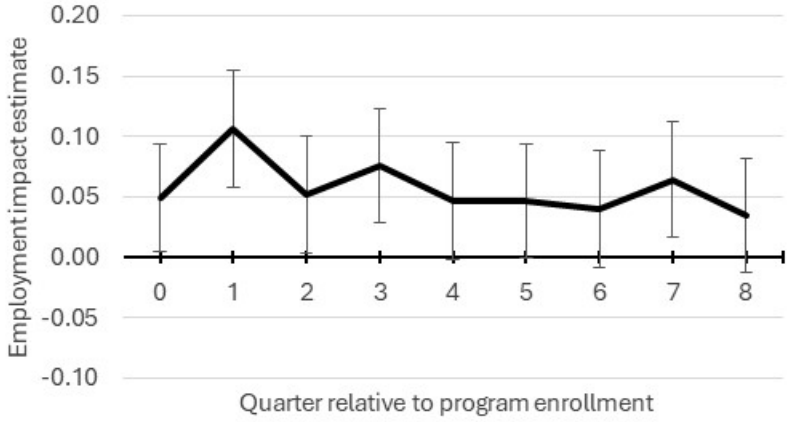
The COVID-19 pandemic caused significant volatility in labor market outcomes (Edwards et al. 2022; Smith et al. 2021). Further, evidence from the implementation study showed that the pandemic adversely affected HVRP services, potentially leading to implications for impacts (Batko et al. 2022). Thus, to determine whether impacts varied with enrollment timing relative to the pandemic, we estimated separate impacts for those who began receiving services before or after the second quarter of 2020. Given that the nature of pandemic disruptions changed over time, we estimated the full set of quarterly impacts across the before-and-after enrollment groups.

We found that differences in impact estimates between the two groups were not statistically significant. However, some evidence suggested that impacts were larger for the pre-pandemic group, which is consistent with the findings from Batko et al. (2022) that the pandemic caused significant disruptions to HVRP services, such as a shift from in-person to virtual service delivery that adversely affected partnerships and referrals. Positive employment impacts emerged for both groups in the quarter of program enrollment (Exhibits IV.7.a and IV.7.b). Yet, impacts for the group that enrolled in services after the onset of the pandemic began to dissipate in the third quarter following enrollment and were close to zero in subsequent quarters (Exhibit IV.7.b). In contrast, impacts estimated for the pre-pandemic enrollment group were about 5 percentage points throughout the follow-up period, though these effects were no longer statistically significant after the fourth quarter (Exhibit IV.7.a).

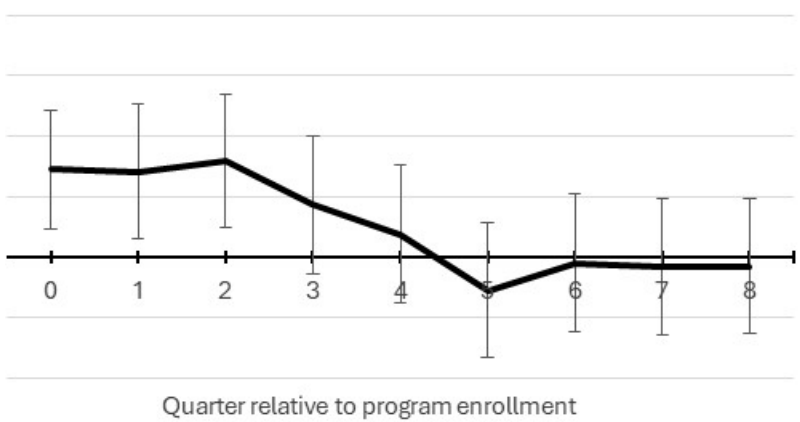
As with the employment impacts, we find that the estimated earning impacts tended to be higher for those who began services before the pandemic, though again the differences were not statistically significant (Exhibits IV.7.c and IV.7.d). Notably, we estimated earning impacts with substantially less precision for the post-pandemic enrollment cohort relative to the pre-pandemic cohort, despite similar sample sizes. The explanation lies in the high degree of variability in earnings for the post-pandemic group, reflecting the period's volatility. We found that the negative but statistically insignificant impact estimated for the full sample for average earnings in quarters seven and eight was driven by the post-pandemic group. This group may have faced unique circumstances throughout the enrollment and follow-up period that may not be generalizable outside this period.

Exhibit IV.7. Impacts of HVRP participation on quarterly employment and earnings, by timing of program enrollment relative to the COVID-19 pandemic

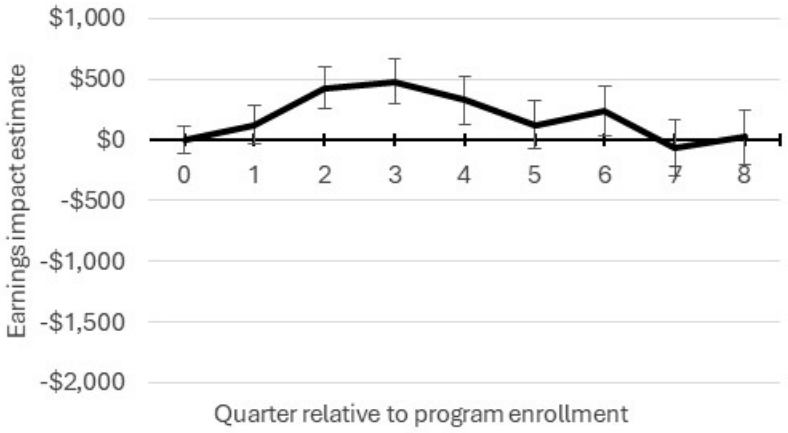
IV.7.a. Employment impacts, pre-pandemic enrollment



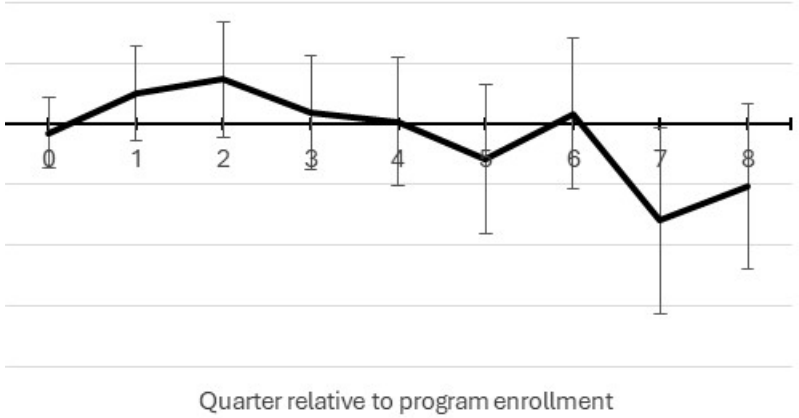
IV.7.b. Employment impacts, post-pandemic enrollment



IV.7.c. Earnings impacts, pre-pandemic enrollment



IV.7.d. Earnings impacts, post-pandemic enrollment



Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. The black lines represent the impact estimate in each quarter. Error bars represent the 95 percent confidence intervals. We estimated impacts separately for each quarter. For a detailed description of estimation methods, see the appendix. The sample includes 623 HVRP participants and 1,403 comparison group members who enrolled pre-pandemic (between June 2019 and March 2020) and 556 HVRP participants and 1,059 comparison group members who enrolled post-pandemic (between April 2020 and June 2021).

2. Participant demographic and county characteristics

In Exhibit IV.8, we present HVRP impacts estimated separately for individuals grouped by gender, age, education, recent employment experience, and local labor market conditions. To reduce the number of statistical tests for these analyses, we focused on four outcomes: the confirmatory outcomes (employment in the eighth quarter and average earnings over quarters seven and eight) and first-year employment and earnings. We present the *p*-values from joint tests of equality in parentheses in the group header row. Values below 0.05 indicate statistically significant variation in impacts. We discuss our motivation for estimating group-specific impacts along each of these dimensions while reviewing the findings below. Overall, we did not find that impacts differed significantly along any of these dimensions. This could be because HVRP services were equally effective for participants from different groups. However, some groups had small sample sizes in the data, which limits the power of our analysis to detect differences in group-specific impacts.

Gender. Female veterans experiencing homelessness may face different employment barriers and service needs (such as child care and housing) than do male veterans experiencing homelessness, suggesting that program effects may differ by gender. However, we did not find statistically significant differences in HVRP impacts by the gender of program participants. Though impacts for female participants tended to be greater in magnitude, this group included only 101 HVRP participants so the analysis had low statistical power to detect significant impacts. The small size of this group was due to both a lower percentage of veterans who are female and a lower percentage of people experiencing homelessness who are female.

Age. The effects of HVRP may differ by age for several reasons. Younger veterans typically have less work experience than older ones and possibly fewer skills. At the same time, younger individuals may be more eager to seek additional education and training services and recognize that they will likely benefit from program services for a considerable time. We did not find statistically significant variation in HVRP impacts across age groups, though the *p*-values from joint tests of equality tended to be close to the 0.05 threshold for age.

Education. Veterans experiencing homelessness who have different pre-program education levels may benefit differentially from HVRP services because of differences in skill and job-readiness levels. However, we did not find statistically significant variation in HVRP impacts across participants' education backgrounds.

Recent employment experience. Job readiness, marketability, and motivation to work may have been greater among those employed around the time of HVRP enrollment than among those with less labor market involvement, suggesting that program impacts could differ with recent employment experiences. A sizeable share (39 percent) of HVRP participants in the sample were not employed during all three quarters in which we observed them before program enrollment. Despite the employment challenges faced by individuals not employed before beginning program services, impacts estimated for this group were similar to those of participants occasionally employed during the baseline period.

Local labor market conditions. Job opportunities for HVRP veterans may be greater in local areas with lower versus higher unemployment rates. To estimate how impacts varied across local labor markets, we interacted the 2018 county unemployment rate, a continuous variable, with the HVRP indicator. The resulting estimate represented the difference in HVRP impact associated with a 1 percentage point higher

county unemployment rate in 2018, equivalent to approximately a standard deviation. HVRP impacts did not differ significantly across counties with different unemployment rates.

Exhibit IV.8. Impacts of HVRP participation on employment and earnings, by demographic and county characteristics

	HVRP participants	Employment impact		Earnings impact	
		Q1 to Q4	Q8	Q1 to Q4	Q7 to Q8
Gender		**(0.44)**	**(0.92)**	**(0.83)**	**(0.51)**
Male	1,078	0.059	0.014	$259	-$286
Female	101	0.098	0.021	$345	-$652
Age		**(0.15)**	**(0.50)**	**(0.07)**	**(0.07)**
20–29	103	0.026	0.034	$346	$366
30–39	241	0.056	0.059	-$245	-$476
40–49	250	0.013	-0.034	$33	-$1,291
50–59	369	0.073	-0.0004	$455	-$87
60–70	216	0.125	0.041	$726	$260
Education		**(0.52)**	**(0.07)**	**(0.63)**	**(0.19)**
High school or less	532	0.080	0.027	$385	-$100
Some postsecondary education	511	0.044	0.033	$207	-$267
Bachelor's degree or higher	136	0.061	-0.105	$25	-$1,386
Recent employment experience		**(0.95)**	**(0.93)**	**(0.57)**	**(0.35)**
No employment in any baseline quarter	462	0.061	0.017	$188	-$116
Some employment at baseline	717	0.063	0.014	$315	-$445
Local labor market conditions		**(0.79)**	**(0.31)**	**(0.96)**	**(0.14)**
County unemployment rate (1 percentage point change)	1,179	-0.003	0.016	$5	$228

Source: NDNH data matched to WIPS data. County unemployment rate comes from the 2018 American Community Survey. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings for the full sample of individuals. Values in parentheses indicate the *p*-value from a test of equality among all the group-specific effects in a category. For a detailed description of estimation methods, see the appendix.

Q =quarter.

C. Sensitivity analyses to examine the robustness of study findings

We conducted additional analyses to determine whether potential biases from program features or model selection decisions influenced the key findings. To reduce the number of statistical tests for these analyses, we focused as above on four outcomes: the confirmatory outcomes (employment in the eighth quarter and average earnings over quarters seven and eight) and first-year employment and earnings.

1. Influence of DVOP service receipt on HVRP impact estimates

The HVRP implementation study found that 78 percent of HVRP participants received services from a DVOP specialist, compared to only 47 percent of other veterans experiencing homelessness who enrolled

in the Wagner-Peyser Employment Service (Johnson et al. 2022). A key element of HVRP's program design is the referral of veterans experiencing homelessness to additional services and supports for which they are eligible. It therefore may be that higher rates of DVOP service receipt among HVRP participants is a positive outcome of HVRP. However, it is also possible that the reverse is true: DVOP specialists could refer veterans experiencing homelessness to HVRP. If such were the case, we could attribute some of our estimated impacts to the DVOP specialists rather than to HVRP, confounding the impact estimates.

To understand more fully the potentially mediating role of DVOP service receipt on the impacts of HVRP participation, we re-estimated the employment and earnings impacts after adding to the regression model an indicator variable capturing DVOP service receipt. Given that we did not observe the direction of referrals between HVRP and DVOP specialists, we interpreted the results of this analysis cautiously. If all DVOP services received by HVRP participants resulted from referrals by HVRP grant recipients (Scenario 1), we would interpret the original impact estimates (Exhibits IV.1 and IV.6) as the impact of HVRP, with the DVOP service indicator capturing the mediating influence of DVOP services. However, we expected that a DVOP specialist referred at least some HVRP participants to the program (Scenario 2). In this case, if services from DVOP specialists contributed to positive employment and earnings effects, then our original impact estimates are inflated.

We interpreted the impact estimate after accounting for DVOP services as a lower bound of the impact of HVRP because it omits the HVRP-to-DVOP referral connection in Scenario 1, which should be considered part of the HVRP effect. In future research, if data on the direction of referrals between HVRP case managers and DVOP specialists were available, those data could be used to directly test whether there were any differences in impacts for HVRP participants who were referred to the program by a DVOP specialist versus HVRP participants who were not referred by a DVOP specialist.

After accounting for DVOP service receipt, we observed that the estimated impact of HVRP on first-year employment and earnings was somewhat smaller and that the earnings impact was no longer statistically significant at the 5 percent level (Exhibit IV.9). The estimated relationships between DVOP service receipt and first-year employment and earnings were positive, indicating that individuals may have benefited from the services provided by DVOP specialists. However, we interpreted the positive coefficient as a suggestive relationship and not a causal effect, as the study design did not apply weights to account for differences in the types of individuals who did and did not receive DVOP services, though regression controls may have accounted for some of these differences.

Exhibit IV.9. Impact of HVRP participation accounting for DVOP service receipt

	Employment		Earnings	
	Q1 to Q4	Q8	Q1 to Q4	Q7 to Q8
Main impact estimate	0.062**	0.015	$267*	-$319
(*p*-value)	(0.00)	(0.42)	(0.03)	(0.12)
Impact accounting for DVOP service receipt	0.055**	0.015	$216*	-$386*
(*p*-value)	(0.00)	(0.46)	(0.10)	(0.08)
Relationship between DVOP service receipt and outcome after accounting for HVRP participation	0.024	-0.001	$118	$122
(*p*-value)	(0.18)	(0.96)	(0.42)	(0.55)

Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. For a detailed description of estimation methods, see the appendix. The sample includes 1,179 HVRP participants and 2,462 individuals in the comparison group.

Q = quarter; DVOP =Disabled Veterans' Outreach Program.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

2. Potential bias from participant screening

In one of the findings from the implementation study, HVRP grant recipients reported that they screened potential veteran participants for work readiness, perhaps determining whether a veteran was interested in pursuing employment or training (Batko et al. 2022). Barriers to employment, such as mental health and substance abuse challenges, could have prevented some veterans from enrolling in HVRP but not in the Wagner-Peyser Employment Service. When veterans faced barriers affecting program enrollment, their path to employment could have led to an upward bias in HVRP's impact. However, this study was unable to measure fully or mirror the complex screening criteria used by HVRP grant recipients to enroll "employable" participants.

In the case of upward bias, we expected the selection effect to be more pronounced for HVRP participants who were persistently not employed before program enrollment. Such individuals would likely have appeared less employable to program recruiters overall; therefore, those among the persistently not employed who passed the program screening would likely have been particularly work-ready. Thus, to assess potential selection effects, we examined whether the impact estimates were greater for those persistently not employed in the baseline quarters than for those already participating in the labor market.

As shown in the previous section, the impact estimates were similar for participants who were not employed in all three baseline quarters and those occasionally employed. We interpreted the estimates as evidence that screening for work readiness likely did not bias the impact estimates. In fact, bias due to screening may have been lower for the evaluation because the comparison group comprised veterans experiencing homelessness who sought employment services through the Wagner-Peyser Employment Service. Thus, the HVRP and comparison groups may have been similar in terms of their motivation to find better jobs.

3. Sensitivity to empirical model selection

We also assessed the sensitivity of our results to two design and analysis decisions. First, we estimated county-clustered standard errors, instead of heteroskedasticity-robust standard errors, to account for potential correlations among the employment and earnings outcomes of sample members within the same counties. Second, using caliper or nearest-neighbor matching rather than inverse probability weights to construct the comparison group weight (Exhibit A.9), we confirmed that the key findings remain unchanged. Findings from these alternative analyses are similar to the main results and do not affect our conclusions. For more details about these design alternatives, see Section D of the appendix.

D. Relationships between impacts and HVRP implementation

In this section, we present analyses to assess whether certain program models and service features were associated with more positive program impacts. The analyses relied on measures from the grantee survey, conducted as part of the implementation study, that collected details on the implementation of key program services from all HVRP grant recipients in program year 2020. Using the survey data, we

constructed seven measures of implementation, described below. We then estimated impacts at the grant recipient level and examined the relationship between program features and impacts.

We interpret the analyses presented in this section as exploratory. Program features were not randomized across grant recipients. Rather, grant recipients adopted their own features to fit their contexts, giving rise to impacts in ways that we could not observe. Because the survey was administered to HVRP grant recipients active in program year 2020 data were available for only 27 out of 42 grant recipients in the analytic sample. Two grant recipients were also excluded from this analysis because they served fewer than 10 HVRP participants in the analytic sample. The small number of grant recipients in the sample therefore presented an additional challenge to measuring relationships between grant recipient impacts and program features. Moreover, the data were collected from during the pandemic-era disruptions, which resulted in measures of program implementation that may not be representative of HVRP program implementation during normal times. Despite these limitations, the analyses can potentially provide suggestive evidence regarding the program features associated with higher or lower impacts.

1. Program Features

We examined measures of HVRP implementation that captured partnership strength, case management, and relationship with employers. We constructed seven indicators based on the questions from the HVRP grantee survey that closely aligned with these program features (Exhibit IV.10).

Partnership strength. HVRP grant recipients are expected to partner with entities in their communities to ensure that participants receive the services they need to succeed at work (Batko et al. 2022). To measure the strength of partnerships formed by grant recipients, we used the following constructs:

- **Number of strong partners.** From a list of 25 types of organizations, the grantee survey asked grant recipients to indicate, for each organization type, whether it was a strong partner, which is defined as a partner considered critical to program success; a moderate partner, which is defined as a partner that the grant recipient works with but does not consider critical to overall program success; or not a partner. This measure counts the number of organization types that grant recipients selected as strong partners.
- **Total number of partners.** This measure is a count of the number of all organization types that grant recipients indicated as a partner, whether moderate or strong.

Case management. HVRP case managers can help participants access and navigate HVRP and partners' services and supports as they work to overcome barriers that make work difficult (Batko et al. 2022). To capture the extent of case managers' involvement with participants and HVRP, we used the following four constructs:

- **Caseload per case manager.** This variable measures the average number of cases per case manager.
- **Number of types of services that case managers provide directly.** HVRP case managers can provide services directly or refer participants to other service providers, although some services are not a case manager's responsibility. From a list of 15 service types, such as housing assistance, job search assistance, transportation services, assessing benefits, and addressing substance abuse or mental health

issues, this variable counts the number of service types that case managers reported that they provided directly.

- **Case manager's time spent working directly with participants.** This variable measures the percentage of time case managers reportedly spent working one-on-one with HVRP participants and supporting veterans' needs.
- **Case manager's time spent on critical HVRP tasks.** This variable measures the percentage of time case managers reportedly spent working on critical HVRP tasks, such as working one-on-one with HVRP participants; planning and leading HVRP workshops or other group activities; interacting with other agencies, for example, to follow up on referrals or to participate in case conferences for shared HVRP clients; and supporting veterans' needs.

Relationship with employers. HVRP programs partner with employers to develop job opportunities for their participants. To determine whether certain types of relationships with employers were associated with better outcomes for participants, we used the following construct:

- **Number of work-based service types provided.** The grantee survey asked grant recipients whether their program provided services from a list of services related to employment and training, whether the services were HVRP-funded, and whether the grant recipient or a partner provided the services. Four of these services were work-based and could indicate a relationship with employers: registered apprenticeships, on-the-job training under a written agreement with an employer, short-term unpaid work experience, and paid internships.

Exhibit IV.10. Summary statistics for program features from the HVRP grantee survey

Measure	Min. value	Max. value	Mean value	Median value	Std. dev.	Number of grant recipients
Partnership strength						
Number of strong partners	2	18	9.1	8.0	4.62	25
Number of partners	12	25	20.3	22.0	3.54	25
Case management						
Caseload per manager (number of cases)	8	75	21.8	15.5	15.07	24
Number of services that case managers provide directly	2	11	6.6	7.0	2.18	25
Case manager's time spent working directly with participants (percentage of time per week)	20	75	47.6	50.0	15.53	25
Case manager's time spent on critical HVRP tasks (percentage of time per week)	40	90	68.0	70.0	13.26	25
Relationship with employers						
Number of work-based services offered	0	4	3.0	3.0	1.09	25

Source: HVRP grantee survey. The grantee survey was administered to all grant recipients in program year 2020.

Notes: The sample includes 25 grant recipients from impact study locations that responded to the HVRP grantee survey in program year 2020 and that had at least 10 HVRP participants in the analytic sample.

2. Grant recipient-specific impacts

To analyze the relationships between program features and impacts, we first estimated impacts for each grant recipient in the analytic sample. We estimated grant recipient-specific impacts similarly to group-specific impacts by including a series of grant recipient indicators in the regression model and interactions between these indicators and HVRP participation. Given that individuals in the comparison group did not receive services from HVRP grant recipients, we used the caliper matching model to associate comparison group individuals with HVRP grant recipients. That is, we associated a comparison individual with the grant recipient of any HVRP participant to whom the individual was matched. Details pertaining to caliper matching appear in Section D of the appendix, and details pertaining to the regression approach appear in Section E of the appendix.

To reduce the number of statistical tests performed during the analysis, we estimated only relationships between impacts and implementation measures for an outcome if there was substantial variation in impacts across grant recipients for that outcome, as determined by a joint test of equality of the impacts across grant recipients. We found statistically significant variation across HVRP grant recipients in impacts on first-year employment, first-year earnings, and both first- and second-year job tenure (Exhibit A.10 in Section F of the appendix).

a. Relationships between grant recipient impacts and program features

For those outcomes with significant variation in grant recipient impacts, we assessed the relationship between estimated impacts and program features by using a univariate grant recipient-level regression. That is, we estimated one regression for each implementation measure and outcome, where each regression had a sample size of 25 grant recipients. Though we were interested in estimating models that controlled for combinations of program features in order to isolate the association between a particular feature and program impacts, we lacked sufficient sample size to make such an analysis meaningful.

We found that only one program feature, the number of strong partners, had a statistically significant relationship with impacts (Exhibit IV.11). Specifically, we found a negative relationship between the number of strong partners and first-year employment and earnings impacts–a counterintuitive finding in that grant recipients rely on partnerships to connect participants with services and jobs. It was reasonable to expect that a greater number of strong partnerships would make it easier to connect participants to services. However, the implementation study found that the shift to remote work during the COVID-19 pandemic adversely affected HVRP grant recipients' partnerships as face-to-face interactions such as in-person referrals were no longer feasible (Batko et al. 2022). Therefore, it may be that, during the COVID-19 pandemic when implementation data and most of the impacts were measured, HVRP grant recipients that otherwise relied on strong partnerships to provide services to participants had trouble achieving positive employment outcomes.

Nonetheless, given that we performed 28 statistical significance tests for this analysis, we expected that at least one of the tests would be significant by random chance, even if the true coefficients were all equal to zero. At the same time, it is important to recognize that we estimated these relationships by using only 25 grant recipient observations and that the observations were sensitive to potential outliers and random noise. In a sensitivity analysis, we re-estimated the relationships by applying precision weights that assigned greater importance to impacts estimated with more precision. Using this approach, we found no

statistically significant relationships (Exhibit A.11 in Section F of the appendix). We therefore concluded that there are no strong associations between grant recipient-specific impacts and the measured HVRP program features.

Exhibit IV.11. Relationships between grant recipient-specific impacts and program features

	Employment	Earnings	Longest job tenure	
	Q1 to Q4	Q1 to Q4	Q1 to Q4	Q1 to Q8
Number of strong partners	-0.019*	-$122	-0.063	-0.113
(*p*-value)	(0.04)	(0.05)	(0.06)	(0.15)
Total number of partners	-0.011	$37	-0.048	-0.056
(*p*-value)	(0.36)	(0.66)	(0.28)	(0.59)
Caseload per manager	-0.002	$0	-0.004	0.01
(*p*-value)	(0.57)	(0.98)	(0.69)	(0.70)
Number of types of services that case managers provide directly	0.002	-$39	-0.012	-0.093
(*p*-value)	(0.93)	(0.78)	(0.88)	(0.58)
Case manager's time spent working directly with participants	-0.001	-$11	-0.005	-0.013
(*p*-value)	(0.61)	(0.56)	(0.60)	(0.59)
Case manager's time spent on critical HVRP tasks	-0.001	-$4	-0.004	-0.003
(*p*-value)	(0.79)	(0.87)	(0.72)	(0.92)
Number of work-based service types provided	-0.001	$174	0.036	0.158
(*p*-value)	(0.99)	(0.52)	(0.81)	(0.64)

Source: NDNH data matched to WIPS data; HVRP grantee survey. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2). The grantee survey was administered to all grant recipients in program year 2020.

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. Job tenure is defined as the number of consecutive quarters an individual was employed by the same employer. For a detailed description of estimation methods, see the appendix. The sample for each regression includes 25 grant recipients that responded to the HVRP grantee survey in program year 2020 and that had at least 10 HVRP participants in the analytic sample.

Q =quarter.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

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V. Conclusion

This study provides important insight into how an employment-focused intervention can support a vulnerable population. The population served by HVRP–veterans experiencing homelessness–is of particular policy relevance given veterans' history of service to the nation and their lack of access to the resources needed for meeting their basic needs (U.S. Department of Veterans Affairs n.d.). However, given that veterans experiencing homelessness are often not linked to a household and often lack a consistent phone number or email address, a study of their life circumstances and needs can pose major challenges (Ojo-Fati et al. 2017). This study therefore provides a unique setting for studying how policy levers can improve the economic conditions of veterans experiencing homelessness. Though we did not find that HVRP had an impact on our confirmatory outcomes of employment and earnings in the seventh and eighth quarters after program enrollment, we can conclude that exploratory outcomes point to the possibility of other important impacts of HVRP on participants.

HVRP aims both to support veterans experiencing homelessness in their efforts to obtain sustainable employment and to help connect them to housing and health supports. Our findings suggest that HVRP helped participants find employment rapidly such that they experienced positive employment effects starting in the quarter of program enrollment. As a result, over the short term, veterans were able to benefit from resources to which they might not otherwise have had access.

In contrast, we did not find sustained higher levels of employment or earnings in the second year following enrollment. The finding is consistent with findings from Batko et al. (2022), indicating that the emphasis on rapid employment may have led grant recipients to prioritize rapid job placement over the appropriateness of positions, which could have resulted in HVRP participants taking jobs that were a poor fit for their skills or interests. However, it is also important to note that job placement is a dynamic process that depends on employer needs, the availability of jobs in the area, and the demand for skills of HVRP participants. The short-term nature of impacts may also reflect the complex challenges facing HVRP participants, such as substance abuse and mental health conditions. Overcoming these obstacles in the long term and finding suitable permanent employment may require more prolonged and intensive services than HVRP participants received during the study period.

Future programs could consider how to build on HVRP services to maintain short-term impacts while increasing long-term gains. For example, programs could craft strategies that prioritize rapid job placement in positions aligned with participant skills and interests. Ongoing supportive services to participants beyond the first year after job placement may also increase participants' ability to remain employed.

To further our understanding of how HVRP supported veterans experiencing homelessness, we also analyzed whether there was a relationship between impacts and specific program features, such as partnership strength, case management, and relationships with employers. We did not find any strong relationships, but this could have been due to the small sample size for that analysis. Additional research with a larger sample of states and grant recipients may be warranted to understand whether some features of HVRP are associated with higher or lower impacts.

It is important to interpret the impact results in the context of the COVID-19 pandemic. Batko et al. (2022) found that the pandemic substantially disrupted the delivery of HVRP services, particular those involving referrals to partners. Approximately half of HVRP participants in this study began receiving services after the onset of the pandemic and therefore likely experienced service disruption in some capacity. Consistent with this finding, some evidence suggests that impacts were lower for participants who enrolled in HVRP services during the pandemic compared to participants who began receiving services before the pandemic's onset. Therefore, the estimated impacts of HVRP may have been greater in the absence of COVID-19.

Though the study focused only on earnings and employment, HVRP may have had broader impacts on participant outcomes. For example, HVRP was designed in part to help connect veterans experiencing homelessness with housing and health care services. Understanding the impact of HVRP on housing stability and other outcomes such as physical and mental health would provide a fuller picture of HVRP's impacts.

The study results highlight ways that future policymakers and researchers could improve their understanding of how to serve veterans experiencing homelessness most effectively. First, additional research could provide greater insights into which elements of HVRP and similar programs are pivotal for improving veterans' employment and earnings. In particular, future research could consider how the change from HVRP's one-year funding model to a three-year funding model affects the types of jobs in which participants are placed and the provision of job retention and career advancement supports.

Second, future research could conduct a comprehensive benefit-cost analysis to assess whether HVRP is a sound investment from the social, taxpayer, and participant perspectives. For example, if the costs of HVRP per participant were relatively low, earnings impacts in the first year after program enrollment that fade out by the second year could result in total earnings gains that are larger than the costs of the program. Such an analysis would ideally compare program benefits associated with the full range of outcomes (including housing and health outcomes) to full program costs (including the costs of HVRP operations as well as differences in costs of other services received by HVRP participants and the study comparison group).

Appendix

In the appendix, we provide additional details to supplement the HVRP impact report. In Section A, we describe the data sources used for the study. In Section B, we outline the process of selecting and recruiting states for the HVRP impact study. We describe, in Section C, the impact study population and steps in obtaining the analytic sample. In Section D, we detail the construction of the weighted comparison group used to estimate impacts. We provide details related to the impact analyses, including estimation of the equations used for regression modeling, in Section E. Finally, we present supplementary exhibits in Section F.

A. Data sources

1. Workforce Integrated Performance System

The Workforce Integrated Performance System (WIPS) is a centralized database that contains information on participants in workforce programs funded by the U.S. Department of Labor (DOL), including the Wagner-Peyser Employment Service. DOL created the system in 2016 to collect standardized data on all participants and programs, including demographic information (such as age, race, education level, and disability status) and data on employment and training services received, training completed, and certificates received.

We obtained WIPS data from DOL for all veterans experiencing homelessness who enrolled in the Wagner-Peyser Employment Service between July 2019 and June 2021 (program years 2019 and 2020). We used the data to measure background characteristics of both the HVRP and Wagner-Peyser groups, define subgroups for analysis, and identify services received and quarters of program entry and exit. The WIPS data we obtained contained unique participant identifiers but did not contain Social Security numbers (SSN) that could be used to collect earnings and employment data. We negotiated with states to provide the WIPS identifiers and SSNs for veterans experiencing homelessness.

2. Technical Performance Reports

HVRP grant recipients submitted Technical Performance Reports (TPR) to DOL as part of their overall grant reporting. The TPRs included data on all HVRP participants at each grant recipient site, including partial first and last names, gender, and race and ethnicity.

We included TPR data in the analysis in response to concerns about the accuracy of the HVRP participation indicator in WIPS. Specifically, we found in early study design work that the total number of HVRP participants in WIPS was lower than what we would have expected given HVRP grant recipients' TPRs. To understand the source of the discrepancy, we merged data in WIPS with TPR data, merging on participant name (full name in WIPS and partial name in the TPR reports), gender, and race/ethnicity. We found that the HVRP participation indicator from WIPS agreed with the TPR data for approximately 86 percent of veterans experiencing homelessness (Exhibit A.1). It is important to note that the sample sizes in Exhibit A.1 include all veterans experiencing homelessness in program years 2019 and 2020 before we imposed additional restrictions requiring the inclusion of veterans in the NDNH data and veterans' residence in a county served by HVRP.

Exhibit A.1. Results of the TPR-WIPS matching

		In TPRs		Total
		No	Yes	
In WIPS	HVRP indicator = No	4,897	488	5,385
	HVRP indicator = Yes	442	1,060	1,502
	Total in WIPS	5,339	1,548	6,887

Note: The data from WIPS and TPRs cover program years 2019 and 2020 in 10 states (Arizona, Florida, Georgia, Michigan, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, Washington) and the District of Columbia.

TPRs = Technical Performance Reports.

To identify HVRP participants in WIPS more accurately, we counted only participants whom we could verify in the TPR data, resulting in a sample size of 1,548 HVRP participants (Exhibit A.1). For the 442 individuals who were categorized as HVRP participants in WIPS but who did not appear in the TPRs, we could not determine if they actually participated in HVRP. It is possible that we did not find them in TPRs because of either TPR-WIPS matching errors or American Job Center staff marking them as receiving HVRP services when they were referred to HVRP but did not end up enrolling in the program. Given ambiguity about some individuals' participation in HVRP, we excluded from both the treatment and comparison groups any veteran identified as an HVRP participant in WIPS but not in the TPRs; we did not include those individuals in the analysis.

3. National Directory of New Hires

We drew employment and earnings data from the National Directory of New Hires (NDNH) database. The Office of Child Support Services, lodged in the Administration for Children and Families of the U.S. Department of Health and Human Services, maintains the database. NDNH contains information on quarterly earnings and Unemployment Insurance (UI) benefits whose data source is the federal government's employment records and data submitted by state UI systems (Tollestrup 2024). It also includes de-identified employer information. At any given time, the NDNH database includes approximately two years of earnings data as the Office of Child Support Services regularly deletes data from previous years. Using participant SSN, first name, and last name, we obtained NDNH data for Wagner-Peyser participants.

NDNH data encompass most, but not all, wage and salary employment. Notably, it does not cover self-employed workers (including employees classified as independent contractors), railroad employees, most agricultural labor, and part-time employees of nonprofit organizations (Moore et al. 2018; Groshen et al. 2022). In the past, these sectors represented about 10 percent of U.S. employment (Kornfeld and Bloom 1999; Hotz and Scholz 2002). NDNH data also exclude workers whose employers do not report their earnings to their UI agency, even in the formal sector, because of the prevalence of flexible staffing arrangements or the illegal failure to report—including, for example, some workers employed by relatives and domestic service workers (Abraham et al. 2018; Katz and Krueger 2019). In addition, NDNH data do not cover casually employed workers, such as day laborers or part-time helpers, and exclude most gig economy work (Abraham et al. 2018; Katz and Kruger 2019).

Although NDNH data include information on quarterly employment and earnings, they do not contain information on specific job characteristics, such as hours worked, hourly wage rates, available fringe

benefits, and occupations. Thus, the present study could not estimate impacts on outcomes related to the occupations or industries of jobs that participants secured through HVRP.

The timing of NDNH data availability also limited our analysis. As noted, the Office of Child Support Services destroys NDNH data after two years, constraining our ability to collect a full history of NDNH data for all veterans experiencing homelessness as described in the previous section. The study team collected nine excerpts from the NDNH database, covering 2018 through 2023. However, given the timing of our data use agreements with states, not all excerpts included all participants. In Exhibit A.2, we list the dates and coverage of each of the nine excerpts.

Exhibit A.2. National Directory of New Hires submissions

Number	Submission date	States covered in submission	Data start date	Data end date
1	10/2/2020	MI, OR, RI, TN	2018Q3	2020Q1
2	10/2/2020	MI	2018Q3	2020Q1
3	11/24/2020	FL, WA	2018Q4	2020Q1
4	12/18/2020	TN	2018Q3	2020Q1
5	3/15/2021	AZ, FL, GA, MI, OR, RI, SC, TN, VA, WA	2019Q1	2020Q2
6	10/1/2021	All	2019Q3	2021Q1
7	12/16/2021	All	2019Q4	2021Q2
8	8/22/2022	All	2020Q3	2022Q1
9	11/14/2023	All	2021Q4	2023Q2

Q = quarter.

B. Selection and recruitment of states for the HVRP impact study

The success of the HVRP impact study design relied on obtaining the cooperation of state workforce agencies. Linking the NDNH and WIPS required participants' personally identifiable information. However, SSNs were not available for Wagner-Peyser participants in the WIPS data provided by DOL—those data included identifiers used only within the workforce system. We therefore conducted outreach—in tandem with the team from the America's Promise Evaluation[14]–to state agencies to obtain crosswalks between WIPS identifiers and SSNs. The America's Promise Evaluation required similar state data.

The outreach process included five stages:

1. **Developing relevant materials.** The study teams developed a common set of outreach materials for communicating with states as well as a tracking tool to identify and record each state's points of contact.
2. **Prioritizing states.** We determined the order in which to contact states, based partly on the number of HVRP participants reported in grant recipient quarterly progress reports as well as on the number of veterans experiencing homelessness in each state's WIPS data for program year 2017. We began outreach with a small set of six states in May 2019 to test our materials and approach and then added states in waves through January 2020 until we reached a total of 33 states.

[14] Mathematica conducted the America's Promise Evaluation along a similar time frame as this study. For more information, see Spitzer et al. (2023).

3. **Identifying appropriate points of contact in each targeted state.** Identifying the correct point of contact for our request posed a significant challenge in many states. Wherever possible, study team members drew on their experience in working with states on similar data collection efforts to identify points of contact. In cases without an obvious contact person, we conducted public records searches for technical leaders within state departments who handled workforce data. Identifying (or, in many cases, being directed to) staff working in the appropriate department within each state was crucial to successful data requests. In several cases, U.S. Department of Labor staff (including staff from the national office and one regional federal project officer) provided responsive contacts.
4. **Conducting outreach.** Once we obtained valid contact information, we sent initial emails and scheduled phone calls with points of contact. We continued to pursue states for study participation until they agreed to participate, declined to participate, or stopped responding to email requests.
5. **Engaging in legal negotiation and reviewing data use agreements.** For states considering our request, we began data use agreement negotiations by using a template either developed by our team or supplied by the state. State solicitors and contracts staff reviewed the materials and often engaged in several rounds of comment and revision.

In total, 10 states and the District of Columbia agreed to provide the study team with data for the HVRP evaluation: Arizona, Florida, Georgia, Michigan, Oregon, Rhode Island, South Carolina, Tennessee, Virginia, and Washington.

C. Sample

The analysis sample comprised HVRP participants and a comparison pool of other veterans experiencing homelessness who were enrolled in the Wagner-Peyser Employment Service but who did not participate in HVRP. We started with a sample of 1,548 HVRP participants and 4,897 potential comparison individuals and imposed the following restrictions on the sample:

1. All participants must have been between the ages of 20 and 70, must have had valid data on county of residence, and must not have had missing values of the WIPS variables used to assess balance as listed in Section III.D.[15] This limitation resulted in the exclusion from the sample of 19 HVRP participants and 323 potential comparison individuals.
2. We also excluded individuals who participated in HVRP in program year 2018. This restriction means that we captured new enrollees in the HVRP group and ensured that the comparison group did not recently receive HVRP services. This limitation excluded 93 HVRP participants and 200 potential comparison individuals.
3. The HVRP and comparison groups needed at least three quarters of NDNH data previous to HVRP or Wagner-Peyser participation. Due to the timing of program entry and our submission of NDNH data requests, this restriction resulted in the exclusion of 225 HVRP participants and 784 potential comparison individuals. We excluded an additional 11 HVRP participants and 32 potential comparison individuals because of issues with matching their SSNs in the NDNH data.

[15] For some characteristics, such as whether the participant had previous justice involvement, it was common for participants to decline to answer a question. In these cases, we kept participants in the sample and created a separate value of the variable to capture missing observations.

4. All participants must have resided in a county in the study states that served at least one HVRP and one potential comparison participant, both of whom satisfied the above restrictions. As a result, we excluded an additional 16 HVRP participants and 1,035 potential comparison individuals.

After we imposed these restrictions, we counted 1,184 HVRP participants and 2,523 potential comparison group individuals in the study sample. Our sample of HVRP participants exhibited demographic characteristics similar to the nationwide sample of HVRP participants co-enrolled in the Wagner-Peyser Employment Service analyzed in Johnson et al. (2022) (Exhibit A.3).

Exhibit A.3. Demographic characteristics of HVRP participants in the impact analysis and HVRP participants nationwide

Baseline characteristic	HVRP impact sample mean	HVRP nationwide sample mean
Age categories		
20–39 years	29	29
40–59 years	52	53
60–70 years	18	19
Female	9	12
Race and ethnicity		
White	44	41
Black	41	42
Hispanic	9	9
Education level		
High school or less	45	47
Some postsecondary education	43	41
Bachelor's degree or higher	12	12
Public benefits	18	19
Previous justice involvement	21	20
Sample size	1,184	5,109

Source: Authors' calculations using WIPS data for the HVRP impact analysis sample; results reported in Johnson et al. (2022).

Notes: The sample analyzed in Johnson et al. (2022) included HVRP participants nationwide who co-enrolled in the Wagner-Peyser Employment Service during program years 2019 and 2020. Identification of HVRP participants in Johnson et al. (2022) was based on the HVRP flag in WIPS without additional information from grant recipient TPRs. This exhibit does not include a row for disability status because the disability variable analyzed in Johnson et al. (2022) was based on individuals' self-identification as having a physical or mental impairment and did not capture service-connected disabilities.

D. Weighted comparison design

1. Design overview

We used propensity score–based inverse probability weights to construct a comparison group of veterans experiencing homelessness. Propensity scores estimate the likelihood of HVRP participation, conditional on characteristics of individuals before program enrollment. We calculated propensity scores by using a logistic regression model of HVRP participation based on characteristics predictive of participation in the program and labor market outcomes. We explored the use of researcher- and data-driven approaches to variable selection for estimating propensity scores and tested the sensitivity of results by using matching techniques instead of inverse probability weighting.

a. Balancing variables and data processing

To construct a comparison group that was as similar as possible to HVRP participants, we sought to create balance across HVRP participants and the comparison group on baseline employment histories, demographic characteristics, and local labor market conditions. These dimensions are theoretically relevant to employment and earnings outcomes and may have affected an individual's decision to enroll in HVRP.

To account for the significant volatility in the labor market over the study period, we prioritized balance on state of residence and year-quarter of enrollment, ensuring that job openings and potential wages at a given time relative to program enrollment were similar for HVRP participants and the comparison group. We also explored the feasibility of obtaining perfect balance on county of residence, instead of state, to make comparisons across the same local labor markets. However, we found there were many HVRP participants who would have few or no potential comparison individuals within the same county and year-quarter of enrollment. To preserve the number of HVRP participants in our analytic sample, we pursued balance on state and included country characteristics in the analysis.

b. Selecting covariates for the propensity score model

We explored two approaches to selecting covariates for inclusion in the propensity score model. In later subsections, we discuss our criteria–motivated by the goal of satisfying the selection on observables assumptions of the study design–for selecting the preferred model.

No interaction model. The reference model for estimating propensity scores used as main effects all variables selected by the study team as theoretically relevant to program participation and employment outcomes. Included among these variables were gender, age, race, education level, disability status, years since military separation, previous justice involvement, and receipt of public benefits. We also included information relevant to participants' employment experience before program enrollment: earnings in each quarter before enrollment, employment dynamics (capturing each possible combination of employment history in the three baseline quarters), longest job tenure before enrollment, and receipt of UI in any baseline quarter. Finally, we obtained the following characteristics of the county of residence from the 2018 American Community Survey: veterans' log median household income, log of the veteran population, poverty rate, urban inhabitant rate (based on the 2010 census), overall unemployment rate, veteran unemployment rate, and veteran labor force participation rate.

LASSO-selected interactions. To determine if additional variables would improve the propensity score model's predictive power, we used a double-selection least absolute shrinkage and selection operator (LASSO) model. The model searched over potential variables to choose those most predictive of either the treatment (HVRP participation) or the outcome, subject to a regression penalty for over-fitting. The double-selection approach involved running LASSO by, first, using HVRP participation as the dependent variable; second, running LASSO by using employment in the eighth quarter following program enrollment as the dependent variable; and, finally, taking the union of covariates selected by either run of the LASSO.

Initially, we allowed LASSO to select from any of the main effects included in the no-interaction model as well as from a full set of interaction terms. However, this approach led to the exclusion of several

theoretically relevant variables from the propensity score model, such as baseline employment characteristics. Moreover, calculation of the propensity score estimates using the variables selected by this approach resulted in worse balance compared to the no-interaction model (we describe our assessment of the models in more detail later in this section). To improve LASSO's performance, we allowed it to select from the full set of interaction terms after requiring LASSO to include the main effects from the no-interaction version of the model.

We used a common rule of thumb to select the penalty parameter, λ, by taking the largest possible value of λ with a mean squared prediction error within one standard error of the minimal mean squared prediction error (Hastie et al. 2015). We estimated the LASSO models by using the `lasso` command in Stata, specifying 10-fold cross validation for the `1se` option.

The LASSO model selected four interacted terms for inclusion in the propensity score model, along with the main effects from the no-interaction model. The four interacted terms were as follows: high school education interacted with county urbanicity rate; baseline employment dynamics of Q3 = 1, Q2 = 0, Q1 = 0 interacted with baseline UI benefit receipt; multiracial/other race interacted with baseline UI benefit receipt; and age group 50 to 59 interacted with the log of the number of working-age veterans in the county. The propensity score model estimated with these variables performed best on our evaluation metrics, as described in detail below; therefore, we selected it as our primary approach.

c. Propensity score estimation and trimming

We calculated propensity scores by using a logistic regression model with the dependent variable an indicator of HVRP participation and the independent variables those variables selected under the two approaches described above. We trimmed propensity scores to protect against poor sample overlap and, when using inverse probability weights (IPW), to protect against the influence of scores at extreme values. We followed the optimal trimming procedure described by Crump et al. (2009) and removed a small share of HVRP and comparison individuals with very high or very low propensity scores.[16]

d. Weighting approaches

Using estimated propensity scores, we constructed a comparison group by both calculating inverse probability weights and employing various matching techniques.

Inverse probability weights. We set the weights to equal one for HVRP participants and, for comparison individuals, calculated weights from the inverse of the estimated propensity score, that is, $ipw = \hat{p} / \left(1 - \hat{p}\right)$, where $\hat{p}$ is the estimated propensity score. We applied an additional adjustment to the weights so that the number of comparison individuals in a given state and year-quarter of enrollment matched the number of HVRP participants, effectively comparing HVRP participants to comparison individuals in the same state and year-quarter of enrollment. The following formula depicts the adjustment:

[16] The number of observations trimmed from the sample varied with the variables in the propensity score calculations.

$$ipw^{*}_{ist} = ipw_{ist} \sum_{j} \frac{HVRP_j 1\{S_j = s, T_j = t\}}{(1 - HVRP_j) 1\{S_j = s, T_j = t\}}$$

where ipw_{ist} is the initial inverse probability weight for comparison individual *i* residing in state *s* and receiving services in year-quarter *t*, which is multiplied by the ratio of HVRP participants to comparison individuals in the same state and enrollment year-quarter.

Nearest-neighbor matching with replacement. This matching approach paired HVRP participants with the potential comparison individuals with the nearest propensity score. All HVRP participants received a match weight of one. If several individuals had the nearest score, we included all of them in the match and divided the weight by the number of matches. We matched with replacement, meaning that a comparison individual could be matched to more than one HVRP participant. To ensure balance on state and year-quarter of enrollment, we matched only individuals who resided in the same state and enrolled in HVRP or the Wagner-Peyser Employment Service in the same quarter.

Caliper matching. This matching approach selected the set of comparison individuals with propensity scores within a set distance of HVRP participants. We set the radius for caliper matching equal to the largest distance between propensity scores needed to obtain a nearest-neighbor match, ensuring that all HVRP participants matched to at least one comparison individual. All HVRP participants received a match weight of one. Comparison individual weights were inversely proportional to the number of individuals matched to an HVRP participant. Much as we did with nearest-neighbor matching, we matched within state and program-year quarter.

e. Selecting the primary propensity score estimation and weighting approach

To select the primary propensity score model and weighting approach, we assessed each approach according to several metrics.

Standardized difference between variables. To determine the degree of similarity between the HVRP and weighted comparison group, we calculated the absolute value of the standardized difference in means, also known as the effect size, across key balance variables. The effect size transformed differences in means between the treated and control groups to a common scale by dividing by the pooled standard deviation. The Clearinghouse for Labor Evaluation and Research Causal Evidence Guidelines (2022) states that, if effect sizes exceed 0.05 and are statistically significant, regression analysis should control for the corresponding variable. The What Works Clearinghouse (2022) stipulates that baseline equivalence can be established, provided that absolute effect sizes are lower than 0.25 standard deviations.

Propensity score distribution. To determine whether the propensity scores in the treatment and comparison groups exhibited sufficient overlap, we calculated the Bhattacharyya coefficient and conducted a visual examination of the empirical distributions (Bhattacharyya 1943). The coefficient ranges from zero to one, with one indicating that the distributions are equal. Values over 0.95 indicate a strong overlap in the propensity score distributions (Guillerme and Cooper 2016).

Prognostic score. The prognostic score is a prediction of the outcome in the absence of treatment and provides an estimate of how differences between the treatment and comparison groups influence a given

outcome (Stuart et al. 2013). It is calculated by estimating a regression model to predict the outcome using the comparison group sample. Parameters estimated from the model then generated predicted values of the outcome for both the HVRP and comparison groups. We summarized differences in the prognostic score by using effect size units.

After evaluating the above metrics, we chose to construct the comparison group by using inverse probability weights based on propensity scores estimated with LASSO-selected interaction terms. This approach achieved the strongest balance on individual characteristics, which included demographic variables and baseline employment histories (Exhibit A.4). Only two variables (receipt of UI and one of several measures of employment history) had effect sizes exceeding 0.05, and neither was statistically significant (Exhibit A.5).

Though this approach performed slightly worse on county characteristic balance, we prioritized balance on individual characteristics because those characteristics were more predictive of future earnings and employment outcomes than county characteristics.[17] Further, this approach had the smallest prognostic score effect size for both the earnings and employment confirmatory outcomes. All models had strong overlap in the propensity score distribution with values of the Bhattacharyya coefficient equal to 0.97 or higher.

[17] This was confirmed by estimating the joint significance of different variable groupings in the prognostic score model. A larger F-statistic for individuals' characteristics in both the employment and earnings prognostic score models indicated stronger predictive power for the characteristics variables.

Exhibit A.4. Performance of alternative approaches for constructing the comparison group

Interaction selection for *p*-score model	Weighting/ matching method	Sample size		Balance on individual characteristics			Balance on county characteristics			Prognostic score (|ES|)		Bhattacharyya coefficient
		HVRP	Non-HVRP	Average |ES|	Share |ES|>0.05	Share |ES|>0.1	Average |ES|	Share |ES|>0.05	Share |ES|>0.1	Employment	Earnings	
LASSO	IPW	1,179	2,462	0.02	0.05	0.00	0.07	0.71	0.14	0.01	0.01	0.970
LASSO	Caliper	1,179	2,052	0.03	0.16	0.00	0.05	0.43	0.00	0.03	0.03	0.970
LASSO	NN	1,179	741	0.03	0.21	0.00	0.06	0.57	0.00	0.02	0.01	0.970
None	IPW	1,180	2,464	0.02	0.05	0.00	0.07	0.71	0.14	0.02	0.01	0.971
None	Caliper	1,180	2,025	0.03	0.18	0.00	0.04	0.43	0.00	0.03	0.02	0.971
None	NN	1,180	746	0.04	0.32	0.05	0.03	0.29	0.00	0.03	0.03	0.971
No weighting/matching		1,184	2,523	2523	0.06	0.39	0.21	0.06	0.57	0.11	0.18	

Source: NDNH data matched to WIPS data. County characteristics come from the 2018 American Community Survey.

Notes: The non-HVRP sample size reflects the number of unique individuals matched to HVRP participants. Individual characteristics included 25 variables capturing demographic characteristics as well as 13 pre-entry employment outcomes. County characteristics included eight county-level variables. We calculated the prognostic score by estimating a regression model to predict the outcome (eighth-quarter employment or average earnings in quarters seven and eight) by using the comparison group sample. The Bhattacharyya coefficient measures the amount of overlap between the propensity score distributions of the HVRP and non-HVRP groups, and a value of one indicates perfect overlap.

IPW = inverse probability weights, NN = nearest neighbor, ES = effect size, which is the difference in HVRP and non-HVRP weighted means divided by pooled standard deviation.

Exhibit A.5. Sample balance on prognostic scores and key variables under selected approach

Variable	HVRP		Comparison group		Balance			
	Mean/ percent	SD	Mean/ percent	SD	Diff. in means	Pooled SD	Effect size	*p*-value
Prognostic scores								
Employment in eighth quarter	0.421	0.196	0.424	0.190	-0.003	0.193	-0.013	0.77
Average earnings in seventh and eighth quarters	3,140	2,250	3,160	2,120	-23	2,186	-0.010	0.81
Age								
20–29 years	8.7	28.2	8.8	28.4	-0.1	28.3	-0.004	0.93
30–39 years	20.4	40.3	19.3	39.5	1.1	39.9	0.028	0.52
40–49 years	21.2	40.9	21.9	41.4	-0.7	41.1	-0.018	0.73
50–59 years	31.3	46.4	30.4	46.0	0.9	46.2	0.019	0.67
60–70 years	18.3	38.7	19.4	39.6	-1.1	39.1	-0.029	0.54
Female	8.6	28.0	9.1	28.8	-0.5	28.4	-0.018	0.67
Hispanic								
Not Hispanic	9.3	29.1	8.3	27.5	1.1	28.3	0.038	0.31
Hispanic	84.5	36.2	85.2	35.5	-0.7	35.9	-0.021	0.64
Undisclosed	6.2	24.1	6.5	24.7	-0.3	24.4	-0.014	0.79
Race								
White	44.3	49.7	42.1	49.4	2.2	49.5	0.044	0.35
Black	41.1	49.2	43.0	49.5	-1.9	49.4	-0.038	0.41
Other/multiracial	6.4	24.4	5.5	22.9	0.8	23.6	0.035	0.36
Undisclosed	8.2	27.5	9.4	29.1	-1.1	28.3	-0.040	0.42
Disability	38.9	48.8	39.6	48.9	-0.7	48.9	-0.014	0.77
Education level								
High school or less	45.1	49.8	45.1	49.8	0.0	49.8	0.000	0.99
Some postsecondary education	43.3	49.6	44.1	49.7	-0.7	49.6	-0.015	0.75
Bachelor's degree or higher	11.5	32.0	10.8	31.1	0.7	31.5	0.023	0.57
Military separation								
< 10 years	22.6	41.8	22.5	41.8	0.1	41.8	0.002	0.97
10–19 years	18.9	39.2	20.3	40.2	-1.4	39.7	-0.035	0.54
20–29 years	22.7	41.9	21.2	40.9	1.5	41.4	0.036	0.38
30+ years	35.8	48.0	36.0	48.0	-0.2	48.0	-0.004	0.92
Public benefits	18.2	38.6	17.1	37.6	1.2	38.1	0.030	0.50
Justice involvement								
Some previous justice involvement	21.0	40.8	20.0	40.0	1.0	40.4	0.025	0.58
No previous justice involvement	76.3	42.6	77.3	41.9	-1.0	42.2	-0.024	0.59
Undisclosed	2.7	16.3	2.7	16.3	0.0	16.3	0.000	0.99

Variable	HVRP		Comparison group		Balance			
	Mean/ percent	SD	Mean/ percent	SD	Diff. in means	Pooled SD	Effect size	*p*-value
Employed first quarter before enrollment	44.1	49.7	42.9	49.5	1.2	49.6	0.023	0.60
Employed two quarters before enrollment	47.9	50.0	49.3	50.0	-1.4	50.0	-0.027	0.56
Employed three quarters before enrollment	48.6	50.0	49.6	50.0	-1.0	50.0	-0.020	0.67
Employment dynamics								
(Q3 = 0, Q2 = 0, Q1 = 0)	39.2	48.8	37.3	48.4	1.9	48.6	0.038	0.40
(Q3 = 0, Q2 = 0, Q1 =1)	4.2	20.0	3.9	19.4	0.2	19.7	0.012	0.77
(Q3 = 0, Q2 = 1, Q1 = 0)	2.1	14.4	3.0	17.0	-0.9	15.8	-0.055	0.37
(Q3 = 0, Q2 = 1, Q1 = 1)	5.9	23.6	6.2	24.1	-0.2	23.9	-0.010	0.81
(Q3 = 1, Q2 = 0, Q1 = 0)	5.1	22.0	6.1	24.0	-1.0	23.0	-0.045	0.54
(Q3 = 1, Q2 = 0, Q1 = 1)	3.6	18.8	3.4	18.0	0.3	18.4	0.015	0.69
(Q3 = 1, Q2 =1, Q1 = 0)	9.5	29.3	10.6	30.8	-1.1	30.1	-0.037	0.48
(Q3 = 1, Q2 = 1, Q1 = 1)	30.4	46.0	29.5	45.6	0.9	45.8	0.019	0.66
Earnings one quarter before enrollment	2,090	3,950	2,080	3,740	13	3,846	0.003	0.93
Earnings two quarters before enrollment	2,500	4,190	2,520	4,010	-23	4,101	-0.006	0.89
Earnings three quarters before enrollment	2,980	4,860	3,010	4,500	-32	4,683	-0.007	0.87
Longest job tenure across baseline quarters	1.2	1.1	1.2	1.1	0.0	1.1	-0.021	0.63
UI across baseline quarters	14.9	35.7	17.4	37.9	-2.5	36.8	-0.067	0.25
Poverty rate	14.6	3.5	15.0	3.7	-0.4*	3.6	-0.112	0.01
Unemployment rate	6.2	1.0	6.3	1.3	-0.1*	1.2	-0.097	0.023
Urban inhabitant rate (2010 census)	90.7	14.1	90.4	14.9	0.3	14.5	0.022	0.65
Veteran labor force rate	75.8	5.7	75.4	6.0	0.4	5.9	0.069	0.13
Veteran unemployment rate	5.4	1.6	5.6	1.6	-0.1	1.6	-0.088	0.11
Veteran median household income (log)	10.6	0.2	10.6	0.2	0.0	0.2	0.026	0.62
Veteran population (log)	9.9	1.1	9.9	1.1	0.1	1.1	0.062	0.17

Source: NDNH data matched to WIPS data. County characteristics come from the 2018 American Community Survey.

Notes: We calculated means and standard deviations for the comparison group by applying inverse probability weights based on the propensity score model with LASSO-selected interactions. The effect size is the difference in HVRP and non-HVRP weighted means divided by pooled standard deviation. We calculated the prognostic score by estimating a regression model to predict the outcome (eighth-quarter employment or average earnings in seventh and eight quarters) using the comparison group sample. The sample includes 1,179 HVRP participants and 2,462 comparison group individuals.

SD = standard deviation; Q = quarter; UI = unemployment insurance.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

E. Impact analyses

1. Main impact analyses

We estimated impacts by using the following weighted least squares regression model, applying inverse probability weights:

$$y_i = \alpha + \delta_{ts} + X_i\gamma + \beta \times HVRP_i + \epsilon_i$$

where, for each individual *i*, y_i represents the outcome, and $HVRP_i$ indicates receipt of HVRP services. The parameter β represents the impact of HVRP services on the outcome of interest. We controlled for additional variables in the regression, represented by the vector X_i, including linear terms for all the demographic characteristics, pre-enrollment employment and earnings outcomes, and county variables on which we assessed balance. We also included fixed effects for each combination of state of residence and program-year quarter of enrollment, represented by δ_{ts}. The inclusion of all variables used in estimating propensity scores made the estimation strategy doubly robust by providing unbiased estimates if either the propensity score model or regression model were correctly specified. Finally, α is an intercept term, and ϵ_i is an idiosyncratic error term. We estimated heteroskedasticity-robust standard errors, which allow the variance of ϵ_i to differ depending on X_i. For some sensitivity analyses, we also considered clustered standard errors that not only allowed errors to differ across clusters but also allowed for the correlation of idiosyncratic errors within clusters.

We estimated impacts on outcomes measured at different time points relative to when individuals began receiving program services. For all outcomes, we used the same regression framework, including the estimation of quarterly impacts, which we estimated by using a separate regression for each quarter.

2. Group-specific impact analyses

We estimated several additional models to determine the effects of HVRP services separately for different groups of participants. We analyzed impacts for two groups: (1) those defined by the date they enrolled in services and (2) those defined by baseline demographic and local area characteristics. To obtain group-specific estimates, we added an interaction term to the main regression model, allowing HVRP service impacts to differ by group:

$$y_i = \alpha + \delta_{ts} + X_i\gamma + \sum\nolimits_d \beta_d \times Group_i \times HVRP_i + \epsilon_i$$

where there are *d* different estimated impacts, one for each group. For example, the model for gender-specific estimates is:

$$y_i = \alpha + \delta_{ts} + X_i\gamma + \beta_1 \times HVRP_i + \beta_2 \times HVRP_i \times Female_i + \epsilon_i$$

where the impact estimated for male HVRP participants is given by β_1, and the impact estimated for female HVRP participants is $\beta_1 + \beta_2$. In this example with two groups, the estimate β_2 indicates whether the impacts differed between groups. With more than two groups, we tested for group-based differences by using joint F-tests in which the null hypothesis was that all groups had the same impacts. If the test

resulted in a rejection of this hypothesis, it indicated that estimated differences in impacts across the groups were significant.

3. Grant recipient-specific impact analyses

To estimate grant recipient-specific impacts, we added a set of grant recipient indicators to the main regression as well as interaction terms between the grant recipient indicators and the HVRP variable. Specifically, we estimated the regression equation:

$$y_i = \alpha + \delta_{ts} + X_i\gamma + \sum_g G_g\left(\eta_g + \beta_g \times HVRP_i\right) + \epsilon_i$$

where the grant recipient-specific impacts are captured by β_g, and G_g is an indicator for the grant recipient associated with a program participant. For HVRP participants, the latter is simply the grant recipient from which participants received services. Because individuals in the comparison group did not receive services from HVRP grant recipients, we used the caliper matching model to associate comparison individuals with HVRP grant recipients. That is, we associated a comparison individual with the grant recipient of any HVRP participant to whom the participant matched. The parameters η_g captured differences in average outcomes across grant recipients that were not attributable to differences in grant recipient-specific impacts.

F. Supplemental exhibits

In this section, we provide additional results of the analysis that supplement our main findings. The results pertain to differences between the HVRP and comparison groups before implementing our weighting approach, the tests of the impact model's sensitivity to design decisions, and supplemental evidence from the analysis of grant recipient-specific impacts.

1. Sample balance before weighting

In Exhibits A.6, A.7, and A.8, we present HVRP and comparison group means and differences in means before applying weights to the comparison group for individual, pre-program employment, and county characteristics, respectively. The analysis demonstrates that HVRP participants and the potential comparison group of veterans experiencing homelessness were similar on many dimensions before we applied weights to improve balance. However, the analysis revealed statistically significant differences across the samples in gender, race, education level, receipt of public benefits, previous justice involvement, and most pre-enrollment employment outcomes and county characteristics.

Exhibit A.6. Individual characteristics of HVRP and unweighted comparison group

Baseline characteristic	HVRP mean	Comparison mean	Difference	*p*-value
Year-quarter of enrollment				0.03
Third-quarter 2019	15.8	16.9	-1.1	0.39
Fourth-quarter 2019	20.8	19.6	1.2	0.40
First-quarter 2020	16.3	20.7	-4.4**	0.00
Second-quarter 2020	6.9	6.3	0.7	0.44
Third-quarter 2020	11.3	9.9	1.4	0.20
Fourth-quarter 2020	10.6	9.4	1.2	0.25

Baseline characteristic	HVRP mean	Comparison mean	Difference	*p*-value
First-quarter 2021	10.8	9.2	1.7	0.11
Second-quarter 2021	7.4	8.0	-0.5	0.57
Age categories				0.93
20–29 years	9.0	9.8	-0.8	0.44
30–39 years	20.4	20.7	-0.3	0.81
40–49 years	21.1	20.7	0.4	0.77
50–59 years	31.3	31.4	0.0	0.99
60–70 years	18.2	17.5	0.7	0.59
Female	8.6	15.3	-6.7**	0.00
Ethnicity				0.36
Not Hispanic	84.5	82.6	1.9	0.16
Hispanic	9.4	10.7	-1.3	0.22
Undisclosed	6.2	6.7	-0.5	0.54
Race			*	0.02
White	44.3	46.7	-2.3	0.19
Black	41.1	36.3	4.8**	0.00
Other/multiracial	6.3	6.8	-0.5	0.58
Undisclosed	8.2	10.2	-2.0*	0.05
Disability	38.9	37.9	0.9	0.59
Education level			**	0.00
High school or less	45.2	39.5	5.7**	0.00
Some postsecondary education	43.2	46.1	-2.8	0.11
Bachelor's degree or higher	11.6	14.4	-2.9*	0.02
Military separation				0.44
< 10 years	22.7	22.6	0.1	0.93
10–19 years	18.8	21.0	-2.1	0.13
20–29 years	22.7	22.7	0.0	0.97
30+ years	35.7	33.8	2.0	0.24
Public benefits	18.2	13.3	4.9**	0.00
Justice involvement			*	0.02
No previous justice involvement	76.1	75.1	1.0	0.50
Some previous justice involvement	21.0	20.1	0.9	0.51
Undisclosed	2.9	4.8	-2.0**	0.01

Source: WIPS data.

Note: Significance and *p*-values in rows with category headings come from chi-square tests of differences in the categorical distribution of the HVRP and comparison group.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

Exhibit A.7. Pre-program employment characteristics of HVRP and unweighted comparison group

Baseline employment characteristics	HVRP mean	Comparison mean	Difference	*p*-value
Employed one quarter before entry	44.3	47.6	-3.4	0.05
Employed two quarters before entry	48.1	50.9	-2.8	0.11
Employed three quarters before entry	48.6	52.2	-3.5*	0.05
Employment dynamics			*	0.04
(Q3 = 0, Q2 = 0, Q1 = 0)	39.1	37.0	2.1	0.22
(Q3 = 0, Q2 = 0, Q1 = 1)	4.1	3.3	0.9	0.17
(Q3 = 0, Q2 = 1, Q1 = 0)	2.1	2.1	0.0	0.98
(Q3 = 0, Q2 = 1, Q1 = 1)	6.0	5.5	0.5	0.52
(Q3 = 1, Q2 = 0, Q1 = 0)	5.1	5.7	-0.6	0.43
(Q3 = 1, Q2 = 0, Q1 = 1)	3.6	3.2	0.5	0.47
(Q3 = 1, Q2 = 1, Q1 = 0)	9.5	7.5	1.9*	0.05
(Q3 = 1, Q2 = 1, Q1 = 1)	30.5	35.8	-5.3**	0.00
Earnings one quarter before entry	$2,140	$2,958	-$818**	0.00
Earnings two quarters before entry	$2,548	$3,496	-$948**	0.00
Earnings three quarters before entry	$3,006	$3,589	-$583**	0.00
Longest job tenure across baseline quarters	1.2	1.3	-0.12**	0.00
UI benefits in any baseline quarter	14.9	14.6	0.3	0.82

Source: NDNH data matched to WIPS data.

Note: Significance and *p*-values in rows with category headings come from chi-square tests of differences in the categorical distribution of the HVRP and comparison group.

Q = quarter; UI = unemployment insurance.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

Exhibit A.8. County characteristics of HVRP and unweighted comparison group

Baseline employment characteristics	HVRP mean	Comparison mean	Difference	*p*-value
Poverty rate	14.64	14.61	0.03	0.85
Unemployment rate	6.23	6.33	-0.10*	0.04
Urban inhabitant rate (2010 census)	90.57	90.77	-0.2	0.67
Veteran labor force participation rate	75.72	75.72	0.01	0.97
Veteran unemployment rate	5.43	5.32	0.11*	0.04
Veteran median household income (log)	10.62	10.63	-0.01	0.05
Veteran population (log)	9.94	10.10	-0.16**	0.00

Source: American Community Survey (2018) matched to WIPS data.

Note: The urban inhabitant rate comes from the 2010 Census and measures the share of a county's populating residing in Census-defined urban areas or urban clusters (https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html). The poverty rate captures the share of households in a county living below the poverty line, as determined by total household income and the number of household members (https://www.census.gov/topics/income-poverty/poverty.html).

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

2. Model sensitivity of estimated impacts

In Exhibit A.9, we present the results of model sensitivity analyses for our main outcomes of interest; we applied nearest-neighbor and caliper matching instead of inverse probability weights, and the use of clustered standard errors instead of heteroskedasticity-robust standard errors. The results are robust to these alternative model choices, and the estimated impacts are similar in direction and magnitude across the various model specifications. We reached similar conclusions about the statistical significance of estimates.

Exhibit A.9. Sensitivity of estimated impacts to model design choices

	Employment impact		Earnings impact	
	Q1 to Q4	Q8	Q1 to Q4	Q7 to Q8
Baseline [standard error]	**0.062** [0.015]**	**0.015 [0.019]**	**$267* [123]**	**-$319 [295]**
Matching method				
Nearest neighbor	0.069**	0.026	$313*	$5
[standard error]	[0.018]	[0.024]	[146]	[235]
Caliper	0.060**	0.013	$229	-$351
[standard error]	[0.015]	[0.020]	[124]	[212]
Standard errors				
Clustered	0.062**	0.015	$267*	-$319
[standard error]	[0.012]	[0.017]	[130]	[298]

Source: NDNH data matched to WIPS data. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2).

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. The HVRP participant sample includes 1,179 individuals. The comparison group sample includes 2,462 individuals in the baseline model, 741 individuals in the model using nearest-neighbor weights, and 2,052 individuals in the model using caliper weights. For a full description of sensitivity analyses, see Section IV.C.

Q = quarter.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

3. Grant recipient-specific analyses

In Exhibit A.10, we present the full set of results from tests for variation in grant recipient-specific impacts. We found that first-year employment and earnings impacts and both first- and second-year job tenure impacts differed across grant recipients. For a description of the approach to grant recipient-specific analyses, see Section IV.D.

Exhibit A.10. Results of tests for significant variation in grant recipient-specific impacts

Outcome	Number of grant recipients	F-statistic	*p*-value
Average employment from first through fourth quarter	25	2.87	0.00
Employment in eighth quarter	25	1.48	0.06
Average earnings in first through fourth quarter	25	1.76	0.01
Average earnings in seventh and eighth quarters	25	1.33	0.13
Longest job tenure from first through fourth quarter	25	3.19	0.00

Outcome	Number of grant recipients	F-statistic	*p*-value
Longest job tenure from first through fourth quarter	25	2.24	0.00

Source: NDNH data matched to WIPS data; HVRP grantee survey. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2). The grantee survey was administered to all grant recipients in program year 2020.

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. Job tenure is defined as the number of consecutive quarters an individual was employed by the same employer. The F-statistic is the result of a test of the joint equivalence between 25 grant recipient-specific impact estimates for the 25 grant recipients that responded to the HVRP grantee survey in program year 2020 and that had at least 10 HVRP participants in the analytic sample.

In Exhibit A.11, we present estimates of the relationship between grant recipient-specific impacts and program features after applying precision weights equal to the inverse of the variance of the grant recipient-specific impacts. This approach assigns more weight to grant recipients with more precisely estimated impacts. In estimating the relationships, we found no statistically significant relationships between grant recipient impacts and program features after accounting for the precision of impacts.

Exhibit A.11. Relationships between grant recipient-specific impacts and program features, using precision-weighted sample

	Employment	Earnings	Longest job tenure	
	Q1 to Q4	Q1 to Q4	Q1 to Q4	Q1 to Q8
Number of strong partners	-0.009	-$11	-0.017	-0.051
(*p*-value)	(0.28)	(0.88)	(0.64)	(0.27)
Total number of partners	-0.015	$40	-0.072	-0.031
(*p*-value)	(0.11)	(0.42)	(0.11)	(0.52)
Caseload per manager	-0.003	$14	-0.018	0.007
(*p*-value)	(0.38)	(0.28)	(0.32)	(0.67)
Number of types of services that case managers provide directly	0.012	$18	0.052	-0.019
(*p*-value)	(0.38)	(0.86)	(0.45)	(0.83)
Case manager's time spent on working directly with participants	0.001	-$6	0.006	-0.004
(*p*-value)	(0.60)	(0.74)	(0.53)	(0.75)
Case manager's time spent on critical HVRP tasks	0.000	-$3	0.001	0.007
(*p*-value)	(0.95)	(0.91)	(0.95)	(0.69)
Number of work-based service types provided	-0.024	$110	-0.128	0.044
(*p*-value)	(0.23)	(0.41)	(0.16)	(0.62)

Source: NDNH data matched to WIPS data; HVRP grantee survey. Outcome data cover the period from June 2019 (2019Q3) to June 2023 (2023Q2). The grantee survey was administered to all grant recipients in program year 2020.

Notes: Employment is defined as having any earnings in a given quarter, and individuals with zero earnings are included in the calculations to measure average earnings impacts for the full sample of individuals. Job tenure is defined as the number of consecutive quarters an individual was employed by the same employer. The sample for each regression includes 25 grant recipients that responded to the HVRP grantee survey in program year 2020 and that had at least 10 HVRP participants included in the analytic sample. Grant recipients are weighted inversely proportional to the variance of their grant recipient-specific impact estimate.

Q = quarter.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

References

Abraham, Katharine G., John C. Haltiwanger, Kristin Sandusky, and James R. Spletzer. "Measuring the Gig Economy: Current Knowledge and Open Issues." Working Paper no. w24950. Cambridge, MA: National Bureau of Economic Research, 2018. https://www.nber.org/system/files/chapters/c13887/c13887.pdf.

Ashenfelter, Orley C. "Estimating the Effect of Training Programs on Earnings" *The Review of Economics and Statistics*, vol. 60, no. 1, 1978, pp. 47–57.

Balshem, H., V. Christensen, and A. Tuepker. "A Critical Review of the Literature Regarding Homelessness among Veterans." Washington, DC: Department of Veterans Affairs, April 2011. https://www.hsrd.research.va.gov/publications/esp/homelessness.pdf.

Batko, S., M. Hu, A. Oneto, L. Rosenberg, A. Rogin, A. Williams, E. Rosen, et al. "Supporting the Employment of Veterans Experiencing Homelessness: Implementation Study Report for the Evaluation of the Homeless Veterans' Reintegration Program (HVRP)." Report submitted to the U.S. Department of Labor. Princeton, NJ: Mathematica, September 6, 2022. https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/HVRPEval-ImplementationStudy.pdf.

Belloni, A., V. Chernozhukov, and C. Hansen. "Inference on Treatment Effects after Selection among High-Dimensional Controls." *The Review of Economic Studies*, vol. 81, no. 2, April 2014, pp. 608–650. https://doi.org/10.1093/restud/rdt044.

Bhattacharyya, Anil. "On a Measure of Divergence between Two Statistical Populations Defined by Their Probability Distributions." *Bulletin of the Calcutta Mathematical Society*, vol. 35, 1943, pp. 99–109.

Bond, G. R., M. Al-Abdulmunem, D. R. Ressler, D. M. Gade, and R. E. Drake. "A Randomized Controlled Trial of an Employment Program for Veterans Transitioning from the Military: Two-Year Outcomes." *Administration and Policy in Mental Health and Mental Health Services Research*, vol. 49, 2022, pp. 1072–1083. https://link.springer.com/article/10.1007/s10488-022-01208-z.

Burt, M. R. "Evaluation of LA's HOPE: Ending Chronic Homelessness through Employment and Housing: Final Report." Washington, DC: Urban Institute, 2007. https://www.urban.org/sites/default/files/publication/31556/411631-Evaluation-of-LA-s-HOPE.PDF.

Busso, Matias, John DiNardo, and Justin McCrary. "New Evidence on the Finite Sample Properties of Propensity Score Reweighting and Matching Estimators." *The Review of Economics and Statistics*, vol. 96, no. 5, December 2014, pp. 885-897.

Chakrabarti, R., D. Garcia, and M. Pinkovskiy. "Do Veterans Face Disparities in the Labor Market—And What Accounts for Them?". *Liberty Street Economics*. New York: Federal Reserve Bank of New York, May 2023. https://libertystreeteconomics.newyorkfed.org/2023/05/do-veterans-face-disparities-in-the-labor-market-and-what-accounts-for-them/.

Clearinghouse for Labor Evaluation and Research. "CLEAR Causal Evidence Guidelines, Version 2.2." 2022. https://clear.dol.gov/reference-documents/causal-evidence-guidelines.

Crump, R., G. Imbens, O. Mitnik, and V. Hotz. "Dealing with Limited Overlap in Estimation of Average Treatment Effects." *Biometrika*, vol. 96, no. 1, 2009, pp. 187–199. 10.1093/biomet/asn055. https://www.researchgate.net/publication/24031800_Crump_RK_Hotz_VJ_Imbens_GW_Mitnik_OA_Dealing_with_limited_overlap_in_estimation_of_average_treatment_effects.

Culhane, D. P., and T. Byrne. "Ending Chronic Homelessness: Cost-Effective Opportunities for Interagency Collaboration." Working paper. Philadelphia: Penn School of Social Policy and Practice, 2010. https://repository.upenn.edu/spp_papers/143.

Davis, L. L., T. C. Kyrikaides, A. M. Suris, L. A. Ottomanelli, et al. "Effect of Evidence-Based Supported Employment vs Transitional Work on Achieving Steady Work among Veterans with Posttraumatic Stress Disorder A Randomized Clinical Trial." *JAMA Psychiatry*, vol. 75, no. 4, 2018, pp. 316–324. https://jamanetwork.com/journals/jamapsychiatry/fullarticle/2673378.

Davis, L. L., A. C. Leon, R. Toscano, C. E. Drebing, L. C. Ward, P. E. Parker, T. M. Kashner, and R. E. Drake. "A Randomized Controlled Trial of Supported Employment among Veterans with Posttraumatic Stress Disorder." *Psychiatric Services*, vol. 63, no. 5, 2012, pp. 464–470. https://pubmed.ncbi.nlm.nih.gov/22307881/.

de Sousa, T., A. Andrichik, M. Cuellar, J. Marson, E. Prestera, and K. Rush. "The 2022 Annual Homeless Assessment Report (AHAR) to Congress." Washington, DC: U.S. Office of Community Planning and Development, U.S. Department of Housing and Urban Development, December 2022. https://www.huduser.gov/portal/sites/default/files/pdf/2022-ahar-part-1.pdf.

Edwards, R., L. S. Essien, and M. D. Levinstein. "U.S. Labor Market Shows Improvement in 2021, but the COVID-19 Pandemic Continues to Weigh on the Economy." *Monthly Labor Review*. Washington, DC: U.S. Bureau of Labor Statistics, June 2022. https://www.bls.gov/opub/mlr/2022/article/us-labor-market-shows-improvement-in-2021-but-the-covid-19-pandemic-continues-to-weigh-on-the-economy.htm.

Groshen, E. L., D. Nightingale, A. Reamer, Y. Magdy, and M. Raju. "Opportunities for Enhanced Employer Administrative Records to Improve Research, Statistics, and Evaluation." Jobs and Employment Data Exchange Research Enhancement Project report, 2022. https://ecommons.cornell.edu/server/api/core/bitstreams/0005894b-6f54-4a2f-8119-f065d5081686/content.

Guillerme, T., and N. Cooper. "Effects of missing data on topological inference using a total evidence approach." *Molecular phylogenetics and evolution*, vol 94, 2016. pp 146-158.

Hastie, T., R. Tibshirani, and M. Wainwright. "Statistical Learning with Sparsity: The Lasso and Generalizations." CRC Press, 2015. https://hastie.su.domains/StatLearnSparsity/.

Horvitz, Daniel G., and Donovan J. Thompson. "A Generalization of Sampling Without Replacement from a Finite Universe." *Journal of the American Statistical Association*, vol. 47, no. 260, December 1952, pp. 663–685.

Hotz, V. Joseph, and John Karl Scholz. "Measuring Employment and Income for Low-Income Populations with Administrative and Survey Data." *Studies of Welfare Populations: Data Collection and Research Issues*. Washington, DC: National Academy Press, 2002, pp. 275–315.

Huber, Martin, Michael Lechner, and Conny Wunsch. "The Performance of Estimators Based on the Propensity Score." *Journal of Econometrics*, vol. 175, 2013, pp. 1-21.

Imbens, Guido W. "Nonparametric Estimation of Average Treatment Effects Under Exogeneity: A Review." *The Review of Economics and Statistics*, vol. 86, no. 1, February 2004, pp. 4-29.

Iraq and Afghanistan Veterans of America. "Veterans' Employment Challenges: Perceptions and Experiences of Transitioning from Military to Civilian Life." Prudential Inc., 2012. https://eoa.oregonstate.edu/sites/eoa.oregonstate.edu/files/veterans_employment_challenges.pdf.

Johnson, M. T., J. Hartog, A. Espinoza, V. Taylor, P. Schochet, and L. Rosenberg. "Services Provided to Homeless Veterans' Reintegration Program (HVRP) Participants at American Job Centers." Report submitted to the U.S. Department of Labor. Oakland, CA: Mathematica, September 2022. https://www.dol.gov/sites/dolgov/files/OASP/evaluation/pdf/HVRPEval-ServiceReceiptBrief.pdf.

Katz, Lawrence F., and Alan B. Krueger. "Understanding Trends in Alternative Work Arrangements in the United States." *RSF: The Russell Sage Foundation Journal of the Social Sciences*. Vol 5. No. 5. 2019, pp. 132-146.

Kornfeld, Robert, and Howard S. Bloom. "Measuring Program Impacts on Earnings and Employment: Do Unemployment Insurance Wage Reports from Employers Agree with Surveys of Individuals?" *Journal of Labor Economics*, vol. 17, no. 1, January 1999, pp. 168–197.

LePage, J. P., W. B. Martin, A. M. Crawford, A. Rock, J. A. Parish Johnson, and E. L. Washington. "Individualized Placement and Supported Employment for Justice-Involved Homeless and Unemployed Veterans." *Medical Care*, vol. 59(Suppl. 2), April 2021, pp. S195–S198.

McConnell, S., P. Z. Schochet, D. Rotz, K. Fortson, P. Burkander, and A. Mastri. "The Effects of Employment Counseling on Labor Market Outcomes for Adults and Dislocated Workers: Evidence from a Nationally Representative Experiment." *Journal of Policy Analysis and Management*, vol. 40, no. 4, fall 2021, pp. 1249–1287. https://doi.org/10.1002/pam.22305.

Moore, Q., I. Perez-Johnson, and R. Santillano. "Decomposing Differences in Impacts on Survey- and Administrative-Measured Earnings from a Job Training Voucher Experiment." *Evaluation Review*, vol. 42, nos. 5-6, 2018, pp. 515-549.

National Coalition for Homeless Veterans. "Best Practices: Profiles of Promising Homeless Veterans Reintegration Program Grantees." Washington, DC: National Coalition for Homeless Veterans, August 2012. https://www.nchv.org/images/uploads/HVRP_Best_Practices_Vol._2_WEB_.pdf.

National Veterans' Technical Assistance Center. "Homeless Veterans' Reintegration Program HVRP Grantee Welcome Packet," 2019. https://nvtac.org/wp-content/uploads/2019/08/HVRPWelcomePacket_vs2_508_071019.pdf. Accessed April 15, 2024.

National Veterans' Technical Assistance Center. "Homeless Veterans' Reintegration Program (HVRP) Performance 101 Training Session," 2021. https://nvtac.org/wp-content/uploads/2021/10/HVRP-Performance-101-FAQs-20210915-.pdf.

Ojo-Fati, O., A. M. Joseph, J. Ig-Izevbekhai, J. L. Thomas, S. A. Everson-Rose, R. Pratt, K. S. Okuyemi, et al. "Practical Issues Regarding Implementing a Randomized Clinical Trial in a Homeless Population: Strategies and Lessons Learned." *Trials*, vol. 18, 2017, pp. 1–10.

Ottomanelli, L., S. D. Barnett, and L. L. Goetz. "Effectiveness of Supported Employment for Veterans with Spinal Cord Injury: 2-Year Results." *Archives of Physical Medicine and Rehabilitation*, vol. 95, no. 4, April 2014, pp. 784–790. https://doi.org/10.1016/j.apmr.2013.11.012.

Rosenbaum, P. R., and D. B. Rubin. "The Central Role of the Propensity Score in Observational Studies for Causal Effects." *Biometrika*, vol, 70, no. 1, April 1983, pp. 41–55.

Rountree, J., N. Hess, and A. Lyke. "Health Conditions among Unsheltered Adults in the US." Los Angeles: California Policy Lab, 2019. https://www.capolicylab.org/wp-content/uploads/2023/02/Health-Conditions-Among-Unsheltered-Adults-in-the-U.S..pdf.

Schochet, P. Z., J. A. Burghardt, and S. M. McConnell. "Does Job Corps Work? Impact Findings from the National Job Corps Study." *American Economic Review*, vol. 68, no. 5, December 2008, pp. 1864–1886. https://www.aeaweb.org/articles?id=10.1257/aer.98.5.1864.

Smith, S. M., R. Edwards, and H. C. Duong, "Unemployment Rises in 2020, as the Country Battles the COVID-19 Pandemic." *Monthly Labor Review*. U.S. Bureau of Labor Statistics, June 2021. https://www.bls.gov/opub/mlr/2021/article/unemployment-rises-in-2020-as-the-country-battles-the-covid-19-pandemic.htm.

Spitzer, A., B. English, B. Williams, D. Thal, A. Marks-Anglin, C. Weiss, J. Bellotti, et al. "America's Promise Job-Driven Training Grants Impact Evaluation." Report submitted to the U.S. Department of Labor, Chief Evaluation Office. Washington, DC: Mathematica, 2023. https://www.mathematica.org/publications/the-impact-of-regional-sectoral-training-partnerships-findings-from-americas-promise.

Stuart, E., B. Lee, and F. Leacy. "Prognostic Score–Based Balance Measures for Propensity Score Methods in Comparative Effectiveness Research." *Journal of Clinical Epidemiology,* vol. 66, no. 8, 2013, pp. 84–90.

Tibshirani, Robert. "Regression Shrinkage and Selection via the LASSO." *Journal of the Royal Statistical Society: Series B (Methodological)*, vol. 58, no. 1, January 1996, pp. 267–288.

Tollestrup, J. "The National Directory of New Hires: An Overview." Washington, DC: Congressional Research Service, 2024. https://crsreports.congress.gov/product/pdf/RS/RS22889.

Trutko, J., C. O'Brien, A. Trutko, B. Barnow, J. Kaiser, L. Woolsey, M. Naumann, et al. "Formative Evaluation of the Homeless Veterans Reintegration Program (HVRP): Findings from Literature Review, Site Visits, Analyses of Program Administrative Data, and Options for Future Evaluation." Rockville, MD: Avar Consulting, Inc., September 2016. https://www.dol.gov/asp/evaluation/completed-studies/Formative_Evaluation_of_the_Homeless_Veterans_Reintegration_Program_Report.pdf.

Tsai, J., and R. A. Rosenheck. "Risk Factors for Homelessness among US Veterans." *Epidemiologic Reviews*, vol. 37, no. 1, 2015, pp. 177–195. https://doi.org/10.1093/epirev/mxu004.

U.S. Congress. "Jobs for Veterans Act. H.R. 4015, Pub. L. No. 107-288. 2002. https://www.congress.gov/bill/107th-congress/house-bill/4015.

U.S. Departments of Labor, Commerce, Education, and Health and Human Services. "What Works in Job Training: A Synthesis of the Evidence." Washington, DC: U.S. Departments of Labor, Commerce, Education, and Health and Human Services, 2014. https://www.dol.gov/sites/dolgov/files/OASP/legacy/files/jdt.pdf.

U.S. Department of Labor. "Enrollment of Homeless Veterans Program Participants into a Workforce Innovation and Opportunity Act (WIOA) Workforce Program at an American Job Center (AJC)." Veterans' Program Letter No. 03-16. Washington, DC: U.S. Department of Labor, July 2016. https://www.dol.gov/sites/dolgov/files/VETS/legacy/files/VPL-03-16.pdf.

U.S. Department of Labor. "Notice of Availability of Funds and Funding Opportunity Announcement for: Homeless Veterans' Reintegration Program (HVRP), Incarcerated Veterans' Transition Program (IVTP), and the Homeless Female Veterans' and Veterans' with Families Program (HFVVWF) (referred to collectively as HVRP)." Washington, DC: U.S. Department of Labor, 2020. https://www.dol.gov/sites/dolgov/files/vets/files/foa-vets-20-01.pdf.

U.S. Department of Labor. "PIRL Reporting Online Resource Release 3.0." Washington, DC: U.S. Department of Labor, 2021. https://www.dol.gov/agencies/eta/performance/reporting.

U.S. Department of Labor. "Notice of Availability of Funds and Funding Opportunity Announcement for: Homeless Veterans' Reintegration Program (HVRP), Incarcerated Veterans' Transition Program (IVTP), and the Homeless Women Veterans' and Homeless Veterans' with Children Reintegration Grant Program (HWVHVWC) (referred to collectively as HVRP)." Washington, DC: U.S. Department of Labor, 2023a. https://apply07.grants.gov/apply/opportunities/instructions/PKG00280213-instructions.pdf.

U.S. Department of Labor. "Homeless Veterans' Reintegration Program Participant Eligibility." Veterans' Program Letter No. 02-23. Washington, DC: U.S. Department of Labor, 2023b. https://www.dol.gov/sites/dolgov/files/VETS/files/VPL-02-23-HVRP-Participant-Eligibility.pdf.

U.S. Department of Labor. "Homeless Veterans' Reintegration Program." Washington, DC: U.S. Department of Labor, June 2024a. https://www.dol.gov/agencies/vets/programs/hvrp.

U.S. Department of Labor. "U.S. Department of Labor Awards More Than $57M in Grants to Help Homeless, At-Risk Veterans Re-Enter Workforce." Washington, DC: U.S. Department of Labor, June 2024b. https://www.dol.gov/newsroom/releases/vets/vets20240627.

U.S. Department of Veterans Affairs. "VA Research on Homelessness," n.d. https://www.research.va.gov/topics/homelessness.cfm.

Ware, L., D. Wunderman, and J. Rio. "The Connection between the Homeless Veteran Reintegration Program and the Continuum of Care." Syracuse, NY: National Veterans Technical Assistance Center at the Burton Blatt Institute, Syracuse University, November 2011. https://files.hudexchange.info/resources/documents/HVRPCoCNVTACpaper.pdf.

What Works Clearinghouse. "What Works Clearinghouse Procedures and Standards Handbook, version 5.0." Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, 2022. https://ies.ed.gov/ncee/wwc/Handbooks.

WIOA State Plan. "The Workforce and Innovation Act State Plan." n.d. https://wioaplans.ed.gov/.

Zachary, G., A. Williams, C. Hankey, R. Merrill, R. Lisnic, and A. Herring. "Forty Years of Research on Predictors of Homelessness." *Community Mental Health Journal*, vol. 50, 2020, pp. 692–709. https://doi.org/10.1007/s10597-019-00530-5.

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