Demonstration to Maintain Independence and Employment (DMIE)

Final Report

February 13, 2012

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Policy Research, Inc.

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This document amends a report originally released on June 9, 2011. After completing the original report, we discovered that states inadvertently enrolled into their demonstrations 112 individuals who should have been deemed ineligible, representing 3.3 percent of our analytic sample. Specifically, these individuals were already receiving federal disability payments at the time of their enrollment; the legislation that established the demonstration stipulated that such individuals should be excluded from participation. After removing this group from the study sample, we re-analyzed the data and found only slight changes in the estimates of the impact of the program. The overall message and implications of our findings remain unchanged. The results described in this amended report are based on the revised analyses.

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EXECUTIVE SUMMARY

Legislators, program administrators, researchers, and other stakeholders have expressed strong interest in early intervention programs to forestall dependence on federal disability benefits. The increasing number of individuals in federal disability programs, and the associated expenditures, have prompted the need for early interventions aimed at limiting the future growth of these programs. Although studies on their effectiveness are rare, such programs offer tremendous promise to help workers with chronic and other disabling conditions find appropriate health services so they can remain employed and thus delay or avoid enrolling in federal disability programs.

In response to the need for policies to promote the employment of people with disabilities, Congress authorized the Demonstration to Maintain Independence and Employment (DMIE) as part of the 1999 Ticket to Work and Work Incentives Improvement Act ("Ticket Act"). The purpose of the DMIE was to address the following question: Can an early intervention of medical assistance and other supports delay or prevent reliance on disability benefits and loss of employment for working adults with potentially disabling conditions? Through the DMIE, the Centers for Medicare & Medicaid Services (CMS) provided funding to Medicaid agencies in Texas, Minnesota, Kansas, and Hawaii to develop, implement, and evaluate innovative projects. These grants made it possible to test whether improved access to medical care and other supports would help people to continue working and delay entry into the Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI) programs.[1] CMS asked Mathematica Policy Research to conduct a comprehensive evaluation of the implementation and impact of the DMIE program in the four states.

Each of the four DMIE states was responsible for developing its own intervention, target population, and recruitment methods within broad guidelines. All participating states used random assignment, offered the program to eligible adults 18 to 62 years old[2] who were working at least part time, and excluded persons who indicated that they had pending disability applications or were receiving SSDI or SSI benefits. Primary disabling conditions varied across the states, with Kansas enrolling individuals with a wide array of conditions, Minnesota and Texas focusing on adults with behavioral health issues, and Hawaii targeting people with diabetes.

Broadly, all states provided "wraparound" health services supplementing existing coverage, employment supports, and person-centered case management. DMIE-funded health services went beyond existing health insurance coverage and in some states included dental and vision care, expedited mental health visits, and home visits for assistance with activities of daily living. Reduced premiums, financial subsidies for co-payments, and low or no deductibles for health care were also included as benefits of the DMIE. Employment supports often consisted of employment counseling or development of an individual employment plan. Beyond health and

[1] These are long-term cash benefit programs administered by the Social Security Administration (SSA).

[2] Age requirements differed by state: Kansas and Minnesota enrolled participants between ages 18 and 60, Texas between 21 and 60, and Hawaii between 18 to 62.

employment services, the DMIE programs offered case managers who worked closely with participants to facilitate access to needed treatments, services, and supports.

This is the third and final report on the national DMIE evaluation. The first interim report (Gimm et al. 2009) documented the enrollment and early implementation experiences of the DMIE states. It highlighted the variation in design across states, methods for identifying eligible participants, recruitment challenges, and the random assignment procedure. The second interim draft report (Ireys et al. 2010) estimated the short-term impacts of the DMIE on SSA applications, hours worked, and employment occurring 6 to 12 months after enrollment. Results were mixed: in the first 6 to 12 months after enrollment, the DMIE was effective at reducing SSA applications in a combined sample of the two largest states and maintaining employment rates in Kansas, but had insignificant effects on other outcomes. Both interim reports included findings based on quantitative and qualitative information.

Building on the prior studies, this final report uses more recent and comprehensive data to examine the impact of the DMIE on an expanded set of outcomes. As with the second interim DMIE evaluation report, we assess impacts on participant employment outcomes and applications for or receipt of federal disability benefits. We also conduct a new analysis looking at impacts on participants' health status, functional status, and earnings.

The primary source of data for the analysis is a file of quantitative data collected from the states, referred to as the uniform data set (UDS). The UDS provides standardized information about participants that states collected at baseline and in two follow-up surveys. Information on SSDI and SSI applications was obtained from the Social Security Administration's (SSA) 831 administrative data files. Information on benefit receipt was provided by the SSA Ticket Research File (TRF). The Master Earnings File (MEF) provided data on earnings.

In assessing the DMIE programs, the evaluation examined impacts on three key outcomes: health and functional status, employment outcomes, and reliance on federal disability benefits. Random assignment allows us to define "impact" as a significant difference in outcomes between the treatment and control groups. Highlights of our results include the following:

- **Early intervention services can have a positive impact on health and functional status.** In Hawaii, treatment group members were found to have a 22.3 percentage point lower incidence of reporting any difficulties with Instrumental Activities of Daily Living (IADLs) and positive, though statistically insignificant, health improvements in other areas. We found positive impacts on mental health scores in Minnesota; specifically, treatment group members had a 2.2-point higher mental SF-12 score than control group members. A longer-term state evaluation in Kansas documented significantly higher physical SF-12 scores for treatment group members compared with control group members (Hall et al. 2011). However, DMIE interventions were not associated with significant short-term health impacts in Kansas or Texas.
- **The DMIE interventions' effects on SSDI and SSI applications were mixed.** Earlier findings showed a small but significant impact on disability applications after 12 months of DMIE enrollment in a combined sample of the two largest states (Gimm et al. 2011); however, these results did not persist in the same sample after 24 months. For the group of individuals participating in the DMIE programs, applications were a

statistically rare event within any single year. As a result, several additional years of data would be needed to allow for a robust assessment of the programs' impact on application rates.

- **The DMIE had a positive impact on forestalling or preventing the receipt of SSA benefits in some states**. The DMIE was associated with a statistically significant reduction of 2.0 percentage points in receipt of SSA benefits in Texas and a reduction of 1.4 percentage points in a combined sample of the two largest states (Minnesota and Texas).[3] In Hawaii, none of the participants from either the treatment or control group received SSA benefits after enrollment.

- **The DMIE interventions did not have significant impacts on earnings in any of the four states, while effects on employment were mixed.** None of the DMIE interventions had a statistically significant impact on the earnings of treatment group participants relative to the control group after 12 months. The lack of a significant difference in employment between the treatment and control groups after 13-24 months may reflect the requirement that all DMIE participants be employed at enrollment, so changes were possible only through job loss, a relatively rare event. The vast majority (over 90 percent) were employed during the follow-up period. However, the one- to two-year time frame of the study may be insufficient to capture impacts on employment. The number of hours worked was similarly unaffected by the DMIE in all states with the exception of Hawaii, where hours worked declined among treatment group participants relative to the control group. Program staff in Hawaii suggested this result might stem from some treatment group participants choosing to work fewer hours to improve their work-life balance (Ireys et al. 2010).

Overall, these results suggest that early interventions such as the DMIE can have positive impacts, although the effects are likely to vary across states. Although the early evidence suggests the DMIE led to improvements in health outcomes in Hawaii and Minnesota and declines of SSA benefit receipt in a combined sample of participants in Minnesota and Texas, short-term health benefits were not found in other states and there were no impacts on employment retention or earnings. Varying impacts across states may be attributable to differences in program implementation or the characteristics of participants. For example, participants in Minnesota and Texas were more vulnerable (that is, they had lower earnings, fewer hours worked, and lower education levels) than participants in Hawaii and Kansas.

Timing of participation relative to one's disability status also may be a critical factor in determining a program's impact. Analysis of data from a subset of participants in Kansas suggests that early interventions targeted to workers who have weak attachments to the labor force (that is, are working very little) are likely to be more effective than interventions offered to workers with disabilities who are functioning reasonably well (that is, their functional status in not limiting their employment).

[3] DMIE participants in Minnesota and Texas had similar populations, and the combination of the two states was validated by a Chow test. No other state combinations passed this test.

Like many other studies of demonstration programs, our conclusions should be understood in the context of small sample sizes and the relatively short time frame for the evaluation. Despite these limitations, our results show that early intervention programs may be effective in improving health and reducing dependence on SSA benefits and that further study on the effectiveness of early intervention programs is warranted.

I. INTRODUCTION

A. Background and Purpose of DMIE

Many working adults with physical and mental impairments lack comprehensive access to health care services. First, it may be difficult to find affordable private health insurance due to a pre-existing medical condition. Second, although public health insurance such as Medicare and Medicaid is available to Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) disability beneficiaries, in order to be eligible for these benefits individuals must meet strict disability requirements that, among other things, limit their work and earnings.[4] As a result, employed adults with impairments may decide to exit the labor force or decrease their working hours in order to apply for federal disability benefits and gain access to these services.

An early intervention that provides a broad set of wraparound health and other services, such as case management and employment supports, prior to enrollment in one of the SSA disability programs could prevent impairments from becoming a disability and result in sustained employment and independence from disability benefits. Not only might such an early intervention help individuals to remain independent through continued employment, it could also provide relief to the federal government, which faces a tremendous backlog in SSA applications, and burgeoning rolls.

[4] The technical thresholds for SSDI and SSI qualification are the substantial gainful activity (SGA) level, which in 2011 is $1,000 per month, or $12,000 annually for a nonblind person.

To address this possibility, Congress implemented the Demonstration to Maintain Independence and Employment (DMIE) as part of the Ticket to Work and Work Incentives Improvement Act of 1999 (Ticket Act), which seeks to improve and support the employment of working adults with disabilities. The DMIE was an early intervention program that provided enhanced access to health care services and other supports for workers with potentially disabling conditions who were not yet receiving SSA disability benefits. To participate in the DMIE, at the time of enrollment individuals had to be between 18 and 62 years old,[5] working at least 40 hours per month, and not currently receiving or applying for federal disability benefits.

Under the 2004 and 2006 solicitations, four states successfully implemented DMIE early intervention programs: Kansas, Minnesota, Texas, and Hawaii.[6] In April 2006, Kansas became the first state to enroll participants, followed by Minnesota in January 2007, Texas in April 2007, and Hawaii in April 2008. All DMIE-funded services were mandated to end on September 30, 2009. The target set of conditions varied by state, with Kansas enrolling participants from a statewide high-risk insurance pool, who had a wide variety of physical and mental conditions; Minnesota and Texas focusing on workers with behavioral health issues; and Hawaii recruiting workers with diabetes. More detailed descriptions of the target populations across the four states can be found in the first interim report (Gimm et al. 2009).

[5] Age requirements differed by state, Kansas and Minnesota enrolled participants between ages 18 and 60, Texas between 21 and 60, and Hawaii between 18 to 62.

[6] Under earlier solicitations, CMS awarded a DMIE to Mississippi and to the District of Columbia, both of which focused on adults with HIV. We do not include information on Mississippi's program in this report because enrollment was minimal and the program officially ended in 2007; a description can be found elsewhere (Haber et al. 2007). We do not include information about the District's program because it was implemented without a rigorous evaluation design; descriptive information about it is available elsewhere (Gimm et al. 2009). Rhode Island and Louisiana were approved under earlier solicitations, but neither state implemented a DMIE program. The Rhode Island legislature did not give its support to the program, while Hurricane Katrina scuttled Louisiana's plans. Iowa received a planning grant in 2008 but did not implement a program because the Congressionally imposed deadline for terminating services in September 2009 meant the program would not have been operational long enough to achieve its goals.

States receiving DMIE funding had the flexibility to design the intervention beyond the basic requirements listed above. For example, states could recruit participants with certain limitations and offer different packages of services. All states provided medical benefits and financial assistance for health care, but the specifics and additional services varied across states. Physical therapy and home health visits were provided in Kansas, but employment supports there were more limited compared to the other states. In Minnesota, extended medical services included medical transportation and a subsidized health club membership. DMIE services in Texas included enhanced and expedited mental health services. In Hawaii, medical services included medical therapy management, diabetes education, and nutrition counseling. In Minnesota, Texas, and Hawaii, career counseling was offered.

All DMIE programs were structured as randomized trial designs, in which the target population was recruited and then randomly assigned to two different groups. One group, referred to as the control group, did not receive intervention services but continued to receive or have the opportunity to use existing services. Members of the other group, the treatment group, received early intervention services in addition to their existing menu of services. This type of study design using random assignment is considered the "gold standard" in program evaluations; it allows evaluators to conduct a thorough evaluation on the impacts of the DMIE.

Congress authorized the Center for Medicare & Medicaid Services (CMS) to implement and oversee the DMIE. The Disabled and Elderly Health Programs Group (DEHPG) within CMS has contracted with Mathematica Policy Research to assist in the evaluation of the DMIE.

Mathematica has conducted two previous reports on the DMIE. The most recent report (Ireys et al. 2010) provided Congress with initial findings on the short-term impacts of the DMIE program after 6 to 12 months. In general, the findings across sites showed mixed results. In the majority of states, there were no significant detectable impacts on employment, hours worked, or

SSA disability applications. However, the report did find one potentially promising finding: within one year of DMIE enrollment SSDI and SSI applications declined among respondents in a pooled sample of participants in Minnesota and Texas.

In this report, we update the previous analyses to reflect additional data, measuring impacts 12 to 24 months after enrollment. As in previous reports, we analyzed the impact of the DMIE on reliance on SSA disability benefits and employment, after incorporating an additional year of data. We also examined the effect of the DMIE on an expanded set of outcomes that had not been previously studied, including health status and earnings. The purpose of this report, then, is to estimate the affect of the DMIE on:

- **Health status**, measured by physical and mental SF-12 scores, ADLs, and IADLS
- **Employment outcomes**, including hours worked, non-employment, and earnings
- **Reliance on federal disability programs**, including applications to Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) and receipt of disability benefits.

The DMIE programs targeted working-age people with disabilities who were currently still employed. Hence, key aspects of the DMIE were to promote health, job retention, and delayed entry onto SSA disability programs. Given that it may take several periods for people to leave work or enter a program, particularly for those working at least 40 hours a month, it is important to track DMIE outcomes over multiple periods. While the time frame examined in this report is an improvement over previous reports using data over a more limited time frame, the 12- to 24-month window provided here may still not be sufficient to capture the full extent of all effects.

B. Data Sources

To assess impacts, the evaluation team used state-collected surveys, known as the uniform data set (UDS). These surveys were systematically collected three times over the course of the DMIE: once around baseline enrollment (Round 1), again 6 to 12 months later (Round 2), and for the last time 12 to 24 months after enrollment (Round 3). The UDS uses a standard set of

variables across DMIE states, including information on demographic, health, and employment characteristics of treatment and control participants. Specifically, the UDS includes the following types of variables:

- **Baseline characteristics**. These measures, obtained through Round 1 participant survey responses at baseline, include demographic variables (age, gender, race, education, marital status), employment characteristics (industry, job type, job change frequency, hours worked), and health status (SF-12 scores, number of ADLs and IADLs) at the time of enrollment.
- **Participant outcomes**. We used data from Round 3 to measure the percent of participants employed, hours worked, SF-12 scores, ADLs, and IADLs 12 to 24 months after the DMIE intervention began.
- **DMIE enrollment variables**. The UDS also includes enrollment start and stop dates, group assignment, and intervention start and stop dates. This information helped identify participants who withdrew from the treatment and control groups as well as the duration of exposure to the intervention.

SSA administrative data were also used to track SSDI and SSI applications and participation. Under a data sharing agreement between CMS and SSA, Mathematica obtained information on SSDI and SSI applications through SSA's 831 administrative data files and disability payments from the SSA Ticket Research File (TRF). The 831 File is a summary of initial decisions on all applications for disability benefits. These data are available through the end of September 2010. The TRF contains longitudinal data from January 1994 until December 2009 on SSDI and SSI participation on all individuals who received benefits during this time frame. Access to these data sources gives us information on applications and receipt of benefits prior to and following DMIE enrollment.

Finally, the evaluation team worked with staff at SSA to access information on annual earnings to examine employment and earnings outcomes. Mathematica and SSA worked together to use Earnings File (MEF) data, which includes annual earnings data as reported to the IRS through 2009. These data provided a comprehensive measure of total annual earnings from multiple sources, including self-employment income.

Mathematica integrated these multiple data sources after validation checks and a careful review of data quality. SSA requires that social security numbers be verified before information can be extracted from the TRF or MEF. The result of this process was a final analytic sample of 4,054 participants with verified social security numbers, representing about 99 percent of the 4,099 DMIE participants across the four states.

C. Conceptual Framework

To measure the extent to which the DMIE has achieved its intended goals, it is necessary to understand the pathways through which the intervention operated. In this section, we describe a conceptual framework that illustrates the relationship between the DMIE intervention and several key outcomes.

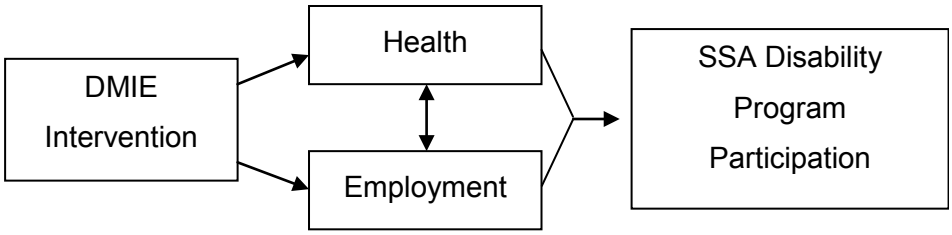
The basis of the DMIE was improved access to health care services and provision of employment supports. With more available and affordable health care, individuals are more likely to receive health services—which can have a positive impact on health. Figure I.1 shows the relationship between the DMIE and health status, with access to health care being the avenue through which the intervention aimed to affect an individual's health. Similarly, employment could be affected by the DMIE through the use of employment supports.

The health and employment variables may influence each other as well. Improved health, for example, may increase hours of employment if gains in health reduce discomfort experienced at work. Alternatively, employment may increase health if higher earnings lead to more investments in health, such as healthy foods and medical care. However, we can only observe a correlation between health and employment; we cannot determine if a causal relationship exists based on the study design. Accordingly, the focus of the conceptual framework is on the impact of the DMIE intervention on health, employment, and reliance on federal disability benefits.

By improving an individual's health and employment outcomes, the DMIE might also decrease the likelihood of that person applying for and receiving federal disability benefits. Eligibility criteria for federal disability programs such as SSDI (and Medicare) or SSI (and Medicaid) are based on a person's health status and earnings.[7] Applicants with disabilities that are determined by SSA to fall below a certain (subjective) severity threshold and/or who have earnings above a certain (defined) threshold are not eligible for federal disability programs.

Receipt of disability benefits can provide an important safety net for some adults with severe disabilities who can no longer work; the intention of an early intervention is not to prevent individuals with more severe disabilities from receiving disability benefits. Instead, the aim of the program is to retain in the labor force adults with potentially disabling conditions who can work and want to continue working (likely a large portion of DMIE participants), a result that is beneficial for both the individual and the community.

Figure I.1. Logic Model of the DMIE



[7] The majority of applications require submission of the individual's medical history, including treatment dates, prescription medicines, and often medical records. Job history and earnings reports (W-2 forms) are also included in application packets.

The logic model describes the basic mechanics of the DMIE intervention; many intricate relationships and other factors have been omitted for clarity.[8] Most notably, baseline demographic characteristics, health history, employment history, and public assistance history may influence health, employment, and disability program participation directly, or may affect the impact the intervention has on all three outcomes. Environmental factors, such as the state of the economy, may similarly affect health, employment, and reliance on disability benefits.

D. Report Overview

Chapter II summarizes the demographic, health, employment, and program participation characteristics of DMIE participants at baseline. Chapter III outlines the methods used in our analyses, including the basic analytic approach, estimation challenges, and remedies. Chapter IV presents findings from multivariate analyses that show the impact of the intervention on mental and physical SF-12 scores and ADL and IADL limitations 12 to 24 months after the start of the intervention. Chapter V describes the results of multivariate analyses of the DMIE intervention on employment outcomes including hours worked, employment status, and earnings. Chapter VI discusses the role of the DMIE in forestalling reliance on federal disability programs as measured by multivariate analyses. Chapter VII summarizes our key findings, study limitations, and policy implications.

[8] For a more detailed logic model, please refer to Gimm and Ireys (2006).

II. ENROLLMENT IN FOUR STATES

DMIE programs across the four states targeted different groups of enrollees in terms of their primary disabling condition and the mechanism through which participants were recruited. Accordingly, the baseline characteristics of DMIE participants varied across the four states. In this chapter, we describe the demographic, health, employment, and program participation characteristics of DMIE enrollees.

Understanding the characteristics of those served by the DMIE programs leads to a better understanding of the evaluation results. When looking at the results, the reader must account for the different populations served by the DMIE programs, which provides important context for the findings. The populations enrolled in DMIE vary greatly by state, but there are some important overlaps in state populations. Where there are overlaps, as is the case for people with behavioral health issues in Minnesota and Texas, there is an opportunity to conduct subgroup analysis. This type of analysis is particularly useful given that some of the key outcomes of the evaluation, especially job loss and SSDI or SSI application, may be relatively rare events during a short time period. Hence, a larger sample will be useful for possibly detecting smaller impacts.

A. Demographic Characteristics

DMIE participants range in age from an average of 39 years in Minnesota to 51 years in Kansas, as can be seen in Table II.1. The majority of participants in all states are female; in Texas more than 75 percent of participants are women. Marriage rates vary by state, with about one-quarter of the DMIE population in Minnesota and Texas and over half of the sample in Kansas and Hawaii currently married. Race varies according to geographic differences, with proportions of non-Hispanic whites above 80 percent in Minnesota and Kansas, and low proportions, below 25 percent, in Texas and Hawaii. Kansas and Hawaii have at least 45 percent four-year college graduates in their respective programs, whereas Minnesota and Texas have much lower rates (20 percent and 8 percent, respectively).

State variation across several characteristics likely reflects differences in both target populations and interventions. Hawaii targeted participants with diabetes, which is more prevalent among older adults. Kansas and Texas both recruited participants with physical impairments (co-occurring with behavioral health conditions in Texas), which also tend to be more prevalent in older populations. Unmarried individuals do not have the alternative option of obtaining employer-sponsored health insurance through a spouse; less than 25 percent of participants in Minnesota and Texas are currently married.

Table II.1: Baseline Demographic Characteristics of DMIE Participants

	Minnesota (n= 1,155)	Texas (n= 1,585)	Kansas (n= 500)	Hawaii (n= 184)
Age (mean years)	38.5	47.0	50.7	48.4
% Female	60.8	76.3	50.6	61.4
% Currently married	23.2	24.8	54.7	52.2
% White and non-Hispanic	81.1	23.3	96.0	17.4
% Four-year college graduate	19.8	8.4	44.5	50.5

Source: UDS submitted by the states.

Note: Values are calculated as percentage of those with nonmissing values.

B. Health Characteristics

The 12-item short form of the Health Survey, referred to as the SF-12, provides reliable information on overall health status. Adopted from a longer battery of questions, the SF-12 has been found to reproduce over 90 percent of the variance in longer instruments while putting less burden on respondents and taking up less room in surveys (Quality Metric 2011). SF-12 scores are norm-based, with a score of 50 representing the national average and every additional 10 points representing a standard deviation. Lower SF-12 scores indicate worse functioning or health status.

Baseline mental and physical SF-12 scores (Table II.2) vary across states, reflecting differences in each state's target population. Minnesota's target enrollment group included individuals with serious mental illness. Accordingly, in that state, mental SF-12 scores are low

and physical SF-12 scores are close to the nationwide average of 50. In Texas, participants with serious mental illness or a behavioral health diagnosis co-occurring with a physical diagnosis were recruited. Physical limitations are reflected in a low physical SF-12 score, but curiously, mental health, as rated by mental SF-12 scores, is about average in Texas. Kansas recruited study participants with a variety of physical and mental ailments from the state's high-risk insurance pool. Similar to Texas, mental health scores are about average while physical SF-12 scores are low. Low physical health scores in Hawaii reflect its target recruitment group, people with diabetes.

Table II.2: Baseline Health Characteristics of DMIE Participants

	Minnesota (n= 1,155)	Texas (n= 1,585)	Kansas (n= 500)	Hawaii (n= 184)
Mental SF-12 Score	35.0	49.6	50.3	47.4
Physical SF-12 Score	48.0	37.9	44.8	45.8
% Any ADL limitation	43.1	41.3	42.0	44.0
% Any IADL limitation	53.6	49.3	43.4	53.8
Average number of conditions	1.6[a]	4.9	3.7	1.0[a]
Primary disabling condition [b]				
MN: % Serious mental illness	49.1			
MN: % Mental illness	47.5			
TX: % Serious mental illness		11.0		
TX: % Mental illness		44.5		
TX: % Other behavioral health issues		29.3		
KS: % Mental illness			36.4	
KS: % Musculoskeletal conditions			33.4	
KS: % Diabetes			25.4	
HI: % Type-1 Diabetes				12.5
HI: % Type-2 Diabetes				85.3

Source: UDS submitted by the states.

[a] Minnesota collects information on a maximum of two co-occurring conditions and Hawaii collects information on a maximum of only one condition. As a result, the number of reported comorbidities may be underestimated for these states.

[b] Diagnostic conditions in Minnesota include severe mental illness, other serious mental disorders, and all other mental health conditions. In Texas, diagnostic major diagnostic categories include serious mental illness, mental illness, other behavioral health diagnoses, and substance abuse diagnoses. In Kansas participants may have multiple conditions; figures indicate a person had at least one condition within a specific category. These conditions include mental illness, musculoskeletal conditions, diabetes, cardiovascular conditions, respiratory conditions, cancer, neurological conditions, immune disorders, gastrointestinal problems, sensory disorders, blood disorders, HIV, renal conditions, stroke and TIA, and endocrine conditions other than diabetes. In Hawaii, diagnostic conditions include type 1 diabetes, type 2 diabetes, and prediabetes.

Despite differences in the target groups and in SF-12 scores, the percent of the sample reporting any functional limitations is similar across states. The proportion of individuals reporting ADL limitations ranges between 41 and 44 percent in the four DMIE locations. The proportion reporting IADLs varies more, with only 43 percent of participants in Kansas reporting any IADL limitations compared to almost 54 percent in Minnesota and Hawaii. The average number of conditions reported in Table II.2 appears to have substantial variation across states. However, Minnesota and Hawaii collect information on fewer conditions than Texas and Kansas, biasing counts in the former states downwards.

C. Employment Characteristics

Labor force attachment ranged across DMIE participants, with more stability and intensity of employment in Kansas and Hawaii (Table II.3). In Kansas and Hawaii, on average participants worked 150 hours per month, approximately half of participants worked full time (49 and 55 percent respectively), and most had not experienced job changes in the last year (90 and 84 percent). By comparison, in Minnesota and Texas on average participants worked 120 hours per month, less than one-third of participants worked full time (24 and 32 percent, respectively), and job stability over the previous year was lower (56 and 73 percent, respectively, had not experienced job changes in the past year). These differences extended to earnings as well, with participants in Kansas and Hawaii reporting earnings more than twice as high as participants in other states in the year prior to DMIE enrollment. Employment outcomes are likely correlated with education; participants in the highest earning states have the highest proportion of college graduates. Industry and occupation also varied across states. Hawaii had the highest proportion of participants employed in the education or health care industries and also the highest share of workers employed in professional, technical, or managerial jobs.

Table II.3: Baseline Employment Characteristics of DMIE Participants

	Minnesota (n= 1,155)	Texas (n= 1,585)	Kansas (n= 500)	Hawaii (n= 184)
Average monthly hours worked	120.8	119.4	148.4	154.2
% Working full time	24.1	32.5	49.0	54.9
% Industry: Education/Health care	21.5	29.2	19.6	38.6
% Job Type: Professional/Technical	18.5	16.6	38.8	49.5
% No job changes in past year	55.7	73.4	89.6	83.7
Annual earnings in year before DMIE enrollment (mean dollars)	$14,373	$14,040	$31,419	$47,581

Source: UDS submitted by the states. Earnings data from the Social Security Administration (SSA) Master Earnings File (MEF)

D. Program Participation

The start of enrollment, rates of disenrollment, and program end dates vary across DMIE states. Kansas was the first state to begin enrollment and is the only state with enrollees in 2006. Minnesota and Texas both began enrollment in 2007, although the majority of participants enrolled in 2008. Hawaii began its program in 2008; accordingly, all participants were enrolled in that year.[9] Disenrollment rates were very low in Minnesota and Texas, but over one-fifth of participants withdrew from the interventions in Kansas and Hawaii (Table II.4). Disenrollment rates in Kansas may be higher in part due to a longer-running program, as participants have more time in which to disenroll. Hawaii, on the other hand had the latest start date, resulting in a short service duration relative to the other sites. Over 20 percent of participants in Hawaii exited the program over the span of the less than one and a half years in which the program was active.

[9] Recruitment of DMIE program participants ended on September 30, 2008, in all four states. The termination date ensured that all participants would be enrolled in the DMIE programs for at least 12 months before federal funding for DMIE services ended on September 30, 2009, as required by the authorizing legislation.

Based on a review of the TRF, we found that 112 individuals (3.3 percent of our analytic sample), did not meet criteria for enrollment. Specifically, these individuals were receiving federal disability payments at the time of enrollment, which is inconsistent with provisions in the federal legislation establishing the DMIE. Moreover, from an evaluation perspective, individuals who are receiving federal disability payments should not be participating in early interventions that are designed to forestall or prevent such outcomes.[10] Ineligible participants enrolled in all four states, accounting for just 0.6 percent of the sample in Hawaii and 3.9 percent of the sample in Texas (Table II.4).

Table II.4: Program Participation Characteristics of DMIE Participants

	Minnesota (n= 1,155)	Texas (n= 1,585)	Kansas (n= 500)	Hawaii (n= 184)
Enrollment Year				
% Enrolled in 2006	0.0	0.0	44.4	0.0
% Enrolled in 2007	41.7	43.5	33.0	0.0
% Enrolled in 2008	58.3	56.5	22.6	100.0
% Withdrew from DMIE at any point	4.8	0.9	25.8	21.7
Ineligible participants (%)	3.8	3.9	1.6	0.6

Source: UDS submitted by the states.

States may have inadvertently enrolled these individuals because they lacked a formal method for verifying that potential enrollees were not receiving SSDI or SSI payments. In most cases, state implementers asked potential participants whether they were receiving such payments; if they said "no" and met all other criteria, they were allowed to join the DMIE project.

[10] Another enrollment condition stipulated that participants could not have pending disability applications at the time of enrollment. Although our data includes information on the submission date of a disability application, we do not know the date on which denial decisions were made. Accordingly, we are unable to classify disability applications as pending and cannot verify whether any DMIE participants had pending applications at the time of enrollment.

III. METHODS

A. Study Design: Random Assignment

Quantitative analyses of program effects can be conducted using several different approaches. With a randomized design in all states, the most basic is a simple comparison of means of key outcomes in the treatment and control groups. This method provides a straightforward picture of the results, and produces unbiased estimates of the demonstration impacts if the randomization method produces treatment and control groups with the same characteristics. However, if the two groups differ, a spurious correlation between the intervention and outcome may be assumed, when in fact an outside factor correlated with both variables is driving the relationship.

To account for differences that may be present between the treatment and control groups despite random assignment, we conducted our analyses using multivariate regressions.[11] Multivariate regression analysis allows us to estimate the statistical association between the intervention and key outcomes while controlling for other factors, such as baseline demographic characteristics and primary diagnosis. We used logistic regression analysis to estimate impacts for binary variables (presence of any ADL or IADL limitations, employment status, application to SSDI or SSI, receipt of disability benefits) and ordinary least squares regression (OLS) to estimate impacts on continuous variables (physical and mental SF-12 scores, number of ADLs, number of IADLs, hours worked and earnings).

[11] Unadjusted differences are presented in Appendix Table C.

Given the differences in the target populations and interventions across the four states, we cannot assume that data can be pooled across sites to conduct one "national" analysis. Baseline summary statistics suggest many similarities between Minnesota and Texas, as noted in the previous section.[12] We conducted a Chow test to determine whether or not any of the states were sufficiently similar for subsequent analyses to be aggregated. Results indicated a two-sample analysis with Minnesota and Texas was valid but other combinations were not statistically comparable. Accordingly, results are presented for each of the four individual states as well as for the pooled "two-state" (Minnesota and Texas) sample.

B. Attrition and Intent-to-Treat Analysis

We conducted an intent-to-treat analysis. This approach considers all treatment group participants as the same and includes all available data, regardless of the extent to which they used the available services. Estimates calculated using an intent-to-treat approach represent a conservative estimate of the true impacts of the specific interventions but accurately capture the effects such a policy might have in practice.

[12] Minnesota and Texas have similar participants with overlapping characteristics: high frequencies of diagnoses of mental illness, low incidences of marriage, similar rates of full-time work, and low annual incomes.

Due to the panel structure of the data, attrition may occur if either treatment or control participants fail to submit their responses to a UDS survey. In all states except for Minnesota, all participants completed Round 1 UDS surveys.[13] Rates of attrition are generally higher in subsequent survey rounds, as displayed in Table III.1. Attrition rates were particularly high in Minnesota and Hawaii, with Round 3 surveys completed by only 76 and 79 percent of participants, respectively, compared to completion rates above 90 percent in Texas and Kansas.

Attrition can be problematic if rates differ by treatment and control groups. For example, if all control group participants submit a Round 3 survey, but the lowest performing percentile of the treatment group does not, it may appear that the intervention had a positive effect, as the group being analyzed is a better subset of the treatment group than of the control group. As shown in Table III.1, differential attrition was particularly problematic in Kansas and Hawaii. In Kansas only 3.6 percent of the treatment group failed to submit a Round 3 survey compared to 15 percent of the control group, and in Hawaii 12 percent of the treatment group failed to submit a Round 3 survey compared to 26 percent of the control group.

Table III.1: Survey Completion Rates, by State and Group

	Texas		Minnesota		Kansas		Hawaii	
	Treat-ment	Control	Treat-ment	Control	Treat-ment	Control	Treat-ment	Control
Completed Round 1	100.0	100.0	97.4	93.7	100.0	100.0	100.0	100.0
Completed Round 2	92.6	89.7	84.0	85.3	97.8	91.3	77.4	90.0
Completed Round 3	92.5	91.1	75.0	78.3	96.4	85.1	74.2	88.3

Source: UDS submitted by the states.

[13] Participants who failed to submit a Round 1 survey, all of whom resided in Minnesota, are excluded from all analyses.

Attrition due to nonresponse is addressed by weighting estimates to account for Round 3 nonresponse. The survey response rate for each state and group (treatment and control) is inverted and used as an adjustment factor, or weight. States with higher rates of attrition (Minnesota and Hawaii) will have larger adjustments made, with more emphasis put on those who did not attrit, in the form of weights. However, weighting can only account for observable differences between the two groups at baseline. This adjustment is only necessary for outcomes measured by variables in the UDS file, which includes hours worked, SF-12 scores, ADLs, and IADLs. Administrative data are available for the entire analytic sample, so analyses involving earnings, DI applications, and DI receipt were not affected by survey nonresponse and thus are not adjusted via the aforementioned weighting procedure.

C. State Recruitment and Enrollment Procedures

In several regards, DMIE enrollment and recruitment varied across the states. Despite many differences, one common trend existed in all states: a small number of ineligible participants enrolled in each site. Recruitment and enrollment practices are described in the following subsections.

1. Texas

After early recruitment strategies in Texas left the state program short of its enrollment targets, the Texas DMIE program employed a more aggressive recruitment strategy. The initial recruitment strategy used in Texas was in the form of direct mailings to workers enrolled in a program providing discounted medical services to low-income, uninsured residents not enrolled in Medicaid. However, despite having access to hospital administrative records, obtaining accurate contact information proved difficult.

To reach its enrollment targets, the state implemented an in-person recruitment method. Potential candidates were identified on clinic appointment schedules and invited to complete the

DMIE application while waiting for their appointment. This change was coupled with an expedited employment verification process. More details about the recruitment methods used in Texas and all states are available in Gimm et al. (2009).

As a result of these recruitment changes, Texas exceeded its recruitment goal—but in the process, may have recruited two inherently different groups of study participants. In-person recruitment required substantially less effort to enroll in the program; as a result, it may have enlisted participants who were less motivated than those recruited via direct mailings. Baseline characteristics confirm that there are differences across these two groups: those recruited in-person have a lower education level, higher incidence of marriage, and lower earnings than the group recruited via the initial strategy. We are not concerned with differences across observable characteristics, though, as these are controlled for in estimation. The concern is that there may be unmeasured characteristics, such as motivation, that are not captured by the data set and thus not included in estimation.

2. Minnesota

Participants for the Minnesota DMIE were recruited through mailed application packets, referrals from community mental health providers, and at state disability conferences. In response to lower-than-expected enrollment numbers, the state increased the maximum age requirement, expanded the demonstration to two additional counties, and encouraged enrollees to recruit family and friends into the program, among other changes.

Enrollment practices in Minnesota changed in May 2008 when the ratio of participants in the treatment to the control groups grew beyond the originally intended size. While working to reach its initial enrollment target, Minnesota planned to maintain its enrollment ratio at three participants in the treatment group for every one participant in the control group. However, beginning in May 2008, the Minnesota project team changed procedures for assigning

participants to the two groups, resulting in nearly five times as many treatment group participants. To ensure that this change did not bias our results, we excluded from our analyses 630 participants who enrolled on or after May 1, 2008. The number of Minnesota participants used in the analyses for this report was 1,155.

3. Kansas

In Kansas, potential participants who met a basic set of criteria were screened to assess their eligibility for the DMIE. Those who were eligible were mailed application packets and enrolled in the demonstration following packet submission. There were early challenges, in that the enrollment numbers fell below Kansas's target enrollment level. Two additional rounds of recruitment were conducted, following which the target enrollment level was met.

4. Hawaii

The initial outreach and recruitment strategy in Hawaii was based on partnership with employers, who would recruit eligible employees to participate in the demonstration through targeted mailings. However, business were hesitant to enroll in the demonstration due to concerns such as differential treatment of employees (in the treatment and control groups) and worries of being financially responsible for the continuation of services after the end of the demonstration.

To bolster enrollment numbers, Hawaii began an open enrollment policy in addition to continuing the employer-based model. Open enrollment outreach was conducted through multiple media sources, health fairs, and service care providers. However, Hawaii fell short of its desired enrollment level, reaching only 36 percent of its original target (Gimm et al. 2009). Low enrollment numbers may limit the detection of significant intervention impacts.

5. Ineligible Participants

As noted previously, all four states enrolled individuals who were receiving federal disability payments. The inclusion of federal disability beneficiaries could potentially skew the

analyses, including analyses on applications for and receipt of federal benefits. Accordingly, we estimated regressions assessing the impact of the DMIE on benefit application and receipt with an additional control variable indicating benefit receipt at the time of DMIE enrollment. We also conducted analyses that excluded these individuals entirely from the study sample (not shown). These analyses produced results similar to those we describe in subsequent chapters.

D. Sample Size and Detectable Impacts

Our analytic plan is based on estimating the likelihood that an intervention affects key outcomes. For an intervention to change an outcome to a measureable degree, the size and variance of the outcome must fall within certain ranges. It is difficult to show that an intervention significantly decreases the occurrence of a rare event—which is important, because the impacts here are measuring generally rare events, including SSDI and SSI applications and job loss for a population that was employed at baseline. For example, only a small percentage of individuals who have work-limiting impairments actually enroll in SSDI or SSI. Stapleton et al. (2005) found that among the employed population reporting a work limitation but not receiving federal disability benefits, approximately 3 percent had enrolled in SSDI or SSI in the following year; this proportion increased to about 10 percent within four years.

Statistical significance levels are typically set at the five percent threshold for program impact analyses (Schochet 2008). This significance level suggests there is only a small chance (5 out of 100) that a difference would have occurred in the absence of the program. In this analysis, we conform with the standard significance level of five percent. However, given that many of our outcomes are rare, we also discuss estimates that are not significant but that meet the 10 percent threshold.

Although there are challenges in identifying impacts for some infrequently occurring outcomes, we do not encounter these difficulties with other outcomes, such as hours worked and

SF-12 scores. Further, as the length of time from the start of the demonstration increases, we expect that it will be easier to identify impacts on variables that occur with a low frequency, such as federal disability benefit receipt, and to a lesser extent SSDI and SSI applications and non-employment. In this report, all outcomes are analyzed within 12 to 24 months of DMIE enrollment; conducting a similar analysis in the future may reveal impacts that are not realized here.

IV. DID THE DMIE IMPROVE HEALTH AND FUNCTIONAL OUTCOMES?

One of the early interventions provided through the DMIE included improving access to health care. The idea behind providing these services was that health care availability and affordability would bring about improved health outcomes and/or prevent declines in health, which might translate into improvements in related outcomes, such as employment and independence from federal disability benefits. In this chapter, we evaluate the impact of the DMIE on four measures of health outcomes: (1) physical SF-12 scores, (2) mental SF-12 scores, (3) percentage reporting any ADL limitations, and (4) percentage reporting any IADL limitations.

A. Mental and Physical SF-12 Scores

Health limitations evolve over time, and participants may have been at different points along the trajectory of disability when they began receiving DMIE services. A comparison of unadjusted mean mental and physical SF-12 scores over the length of the survey reveals a common trend: the health and functional status of those least disabled declined over time, while participants with the lowest initial scores improved during the course of the intervention.[14] This trend holds for both the treatment and control groups and is illustrated in Table IV.1. Table IV.1 shows that for those with the highest SF-12 scores at baseline, one-quarter to one-third experienced an improvement in health status by the Round 3 survey. In contrast, 75 to 86 percent of those with the lowest 15 percent of SF-12 scores at baseline experienced improvements in health status. However, as these were aggregate analyses, regression toward the mean is a possibility.

[14] Both mental and physical SF-12 health scores range from 0 to 100, where 0 represents the lowest measured level of health and 100 represents the highest. The average SF-12 score is 50; 10 points is one standard deviation.

Table IV.1: Unadjusted Baseline Health Characteristics of DMIE Participants

Round 1 SF-12 Score	Round 3 Mental SF-12 Score Improved or Stayed the Same	Round 3 Physical SF-12 Score Improved or Stayed the Same
Good (highest 15% of SF-12 scores)	0.33	0.25
Average (middle 70% of SF-12 scores)	0.60	0.49
Poor (lowest 15% of SF-12 Scores)	0.86	0.75

Source: UDS submitted by the states.

To obtain precise estimates of the impact of the DMIE on health outcomes, we conducted multivariate regressions. Our results show the DMIE had no significant effects on physical SF-12 scores (Table IV.2). Although not significant, the Hawaii DMIE achieved a 2.8-point improvement in physical SF-12 scores. On average, treatment group members in Hawaii reported a physical SF-12 score of 48.2 compared to an average of 45.4 among control group members. Gains in Hawaii, where all participants had diabetes, might be partially attributable to knowledge about the condition in the medical community. Compared to many other conditions, such as cancer and serious mental illness, treating diabetes is relatively straightforward and involves medication and lifestyle changes.

Results presented in Table IV.2 show that the DMIE intervention did not have a statistically significant effect on physical SF-12 scores in the two-state sample, Minnesota, Texas, or Kansas. Efforts in Minnesota and Texas were concentrated on recruiting and providing services to people with behavioral health issues, so it is not surprising that large gains in physical functioning were not experienced in either state. Although participants with mental illness were admitted to the Kansas DMIE (36.4 percent of Kansas DMIE enrollees), participants reported a variety of conditions, including many physical limitations, such as musculoskeletal conditions (33.4 percent), diabetes (25.4 percent), and cardiovascular conditions (24.4 percent). The lack of

significant positive impacts in these states may result from the relatively small time frame (up to two years) over which participants are observed, as will be discussed at the end of this section.

Table IV.2: Impacts on Physical SF-12 Score, 12 to 24 Months After DMIE Enrollment, by State

State	Average Physical SF-12 Score in Treatment Group (Total number in group)	Average Physical SF-12 Score in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	40.0 (1,466)	39.9 (835)	0.1	0.89
Minnesota	46.6 (647)	47.2 (200)	-0.6	0.49
Texas	37.9 (819)	37.6 (635)	0.3	0.47
Kansas	44.0 (217)	45.0 (234)	-1.0	0.31
Hawaii	48.2 (91)	45.4 (53)	2.8	0.09

Source: UDS submitted by the states. Sample sizes are based on the count of nonmissing responses for the physical SF-12 variable.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). SF-12 scores are population norm-based at 50, the nationwide average. Every 10 points is a standard deviation. Lower scores indicate worse functioning or status.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

To examine whether intervention effects varied by enrollment year, we estimated a regression that included an interaction term between treatment group and enrollment year. [15] The results of this estimation are available in Appendix Table A1. In Minnesota and Kansas, intervention services had no significant effect on physical SF-12 scores, regardless of year of enrollment. All participants in Hawaii enrolled in the same year, 2008, making Hawaii ineligible for subgroup analysis by enrollment year. In Texas, however, the intervention had a significant *negative* impact on physical SF-12 scores of 1.4 points (p=0.045) for those who enrolled in 2007, and a significant *positive* impact for those who enrolled in 2008 of 1.8 points (p=0.004). The difference in results may reflect a difference in the recruitment method used in Texas; 70 percent of participants recruited by mail enrolled in 2007 and 92 percent of participants recruited in person enrolled in 2008. Those recruited in person had a lower education level and may have been systematically different than those recruited by mail in ways that are unobservable in the data but which may influence the effect of the intervention. An alternate explanation is that the level of implementation of the interventions may have differed in 2007 and 2008 in Texas.

Statistically significant improvements in mental health, as measured by mental SF-12 scores, were experienced in Minnesota (Table IV.3). The treatment group reported an average mental SF-12 score of 39.6 compared with a score of 37.3 among control group members—a 2.2 point difference that was significant at the three percent level. Minnesota targeted individuals with mental illness (all participants experienced mental illness and 49 percent reported a severe mental illness) and provided mental health services as part of their enhanced medical services

[15] Differences in effects by enrollment year could occur for several reasons. First, there may be unobserved differences between early and late enrollees. Those who enrolled when the program began may be more motivated and aware of the health care landscape or may have a higher need for health services compared to those who enrolled later in the life of the program. Second, there may have been changes to the program over time. For example, as DMIE implementers learned about effective ways of recruiting enrollees and delivering services, the program might have adopted new practices and provided a different mix of services.

coverage. In Minnesota, 69 percent of treatment group participants had a behavioral health visit with a physician, and 15 percent had an outpatient behavioral health visit within the first year of enrollment. The direct links between mental health service availability, use, and outcomes are clearly seen in Minnesota.

There were no mental health service use impacts in other states, which is not surprising given that mental health service use was much lower in these states. Only 5.5 percent in Texas and 11 percent in Kansas used mental health services over the same time period; Hawaii did not record information on mental health service use.

Treatment group participants in Hawaii experienced an improvement in mental health scores of 3.0 points, although this difference was not statistically significant. The pathways through which mental health gains were experienced in Hawaii are less straightforward than in Minnesota. Hawaii targeted people with diabetes for enrollment and focused its efforts on services for that population. However, a strong link between diabetes and mental health limitations has been established. Individuals with diabetes are twice as likely to be diagnosed with depression compared to a similar population of individuals without diabetes, with an even stronger relationship for women under the age of 65 (Egede et al. 2002). Hawaii's recruitment cut-off was age 62 and over 60 percent of participants were women, suggesting that, although unmeasured, a large proportion of participants in Hawaii may have had comorbid mental health issues. The direction of causation between diabetes and mental illness is unknown, but improving physical outcomes associated with diabetes may have contributed to the three-point improvement in mental health score we observed.

Table IV.3: Impacts on Mental SF-12 Score, 12 to 24 Months After DMIE Enrollment, by State

State	Average Mental SF-12 Score in Treatment Group (Total number in group)	Average Mental SF-12 Score in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	48.6 (1,466)	48.2 (835)	0.4	0.42
Minnesota	39.6 (647)	37.3 (200)	2.2	0.03
Texas	51.2 (819)	51.6 (635)	-0.4	0.56
Kansas	50.9 (217)	50.7 (234)	0.2	0.82
Hawaii	50.1 (91)	47.2 (53)	3.0	0.08

Source: UDS submitted by the states. Sample sizes are based on the count of nonmissing responses for the mental SF-12 variable.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). SF-12 scores are population norm-based at 50, the nationwide average. Every 10 points is a standard deviation. Lower scores indicate worse functioning or status.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

B. ADL and IADL Limitations

We now explore changes in functioning using an alternative set of measures: limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs). ADLs measure an individual's ability to perform basic self-care tasks, such as bathing and using the toilet. IADLs measure an individual's ability to perform tasks needed for independent living, such as paying bills and running errands. Generally, ADL limitations represent more severe impairments than IADL limitations, but declines in either ADL or IADL limitations indicate improvements in functioning.

The DMIE had no significant effect on ADL limitations (Table IV.4). Although not significant, the DMIE led to an *increase* in the proportion of treatment group members in Kansas reporting ADL limitations. As mentioned previously, Kansas experienced high attrition rates

among control group members (15 percent) compared to treatment group members (3 percent). Differential attrition among the two groups may affect our evaluation of the outcomes, particularly if those with worse outcomes were the ones who attrited from the control group. If the Kansas control group participants with the lowest expected functioning exited the study, the participants who remained would be the healthiest and would skew the results to appear that participation in the control group is associated with improved functional status. Attempts to weight based on baseline health service usage (which may be a proxy for future health status) produced similar results, neither confirming nor denying our hypothesis that the participants in the Kansas control group with the poorest future health were the ones who ceased participating.[16]

Table IV.4: Impacts on Percent of DMIE Participants Reporting Any ADL Limitations, 12 to 24 Months After Enrollment, by State

State	Any ADL Limitations in Treatment Group (%) (Total number in group)	Any ADL Limitations in Control Group (%) (Total number in group)	Difference (Impact)*	P-Value
Two States	40.0 (1,500)	40.4 (848)	-0.5	0.82
Minnesota	42.6 (679)	39.4 (213)	3.2	0.40
Texas	38.3 (821)	40.8 (635)	-2.5	0.34
Kansas	46.9 (217)	38.9 (234)	8.0	0.09
Hawaii	33.7 (92)	43.4 (53)	-9.7	0.26

Source: UDS submitted by the states. Sample sizes are based on the count of nonmissing responses for the ADL limitation variable.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Activities of daily living (ADL) include bathing, dressing, eating, getting out of bed, walking, going outside, and using the toilet.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

[16] For a formal evaluation of our hypothesis, we would need information on variables that are currently unobservable to us as researchers, such as the health status at Round 3 of those who attrited.

Although the DMIE did not have a significant effect on functioning in Kansas, impacts on functioning by enrollment year suggest that there was a significant increase in the proportion of treatment group members enrolling in 2007 who reported ADL limitations relative to the control group (Appendix Table A.2). This significant decline in functioning was not experienced by 2006 or 2008 enrollees in Kansas.

A significant reduction in IADL limitations was observed among treatment group participants in Hawaii (Table IV.5). Consistent with gains in both physical and mental SF-12 scores, only 38.1 percent of treatment group members in Hawaii had an IADL limitation compared with 60.4 percent in the control group—a 22.3 percentage point difference. Relative to the control group, the largest gains in functioning for Hawaii treatment group members were in completing heavy housework and managing finances (Appendix Table D.1). A positive but insignificant decline in ADLs was also reported among Hawaii treatment group members of almost 10 percentage points (Table IV.4). Impacts on IADLs in all states other than Hawaii were insignificant.

Table IV.5: Impacts on Percent of DMIE Participants Reporting Any IADL Limitations, 12 to 24 Months After Enrollment, by State

State	Any IADL Limitations in Treatment Group (%) (Total number in group)	Any IADL Limitations in Control Group (%) (Total number in group)	Difference (Impact)*	P-Value
Two States	49.6 (1,500)	48.1 (848)	1.5	0.50
Minnesota	52.3 (679)	48.4 (213)	3.5	0.36
Texas	48.7 (821)	47.9 (635)	0.9	0.74
Kansas	53.6 (217)	46.6 (234)	7.0	0.13
Hawaii	38.1 (92)	60.4 (53)	-22.3	0.01

Source: UDS submitted by the states. Sample sizes are based on the count of nonmissing responses for the IADL limitation variable.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Instrumental activities of daily living (IADL) include preparing meals, shopping, paying bills, using the telephone, heavy housework, light housework, getting to places outside of walking distance, and managing medications.

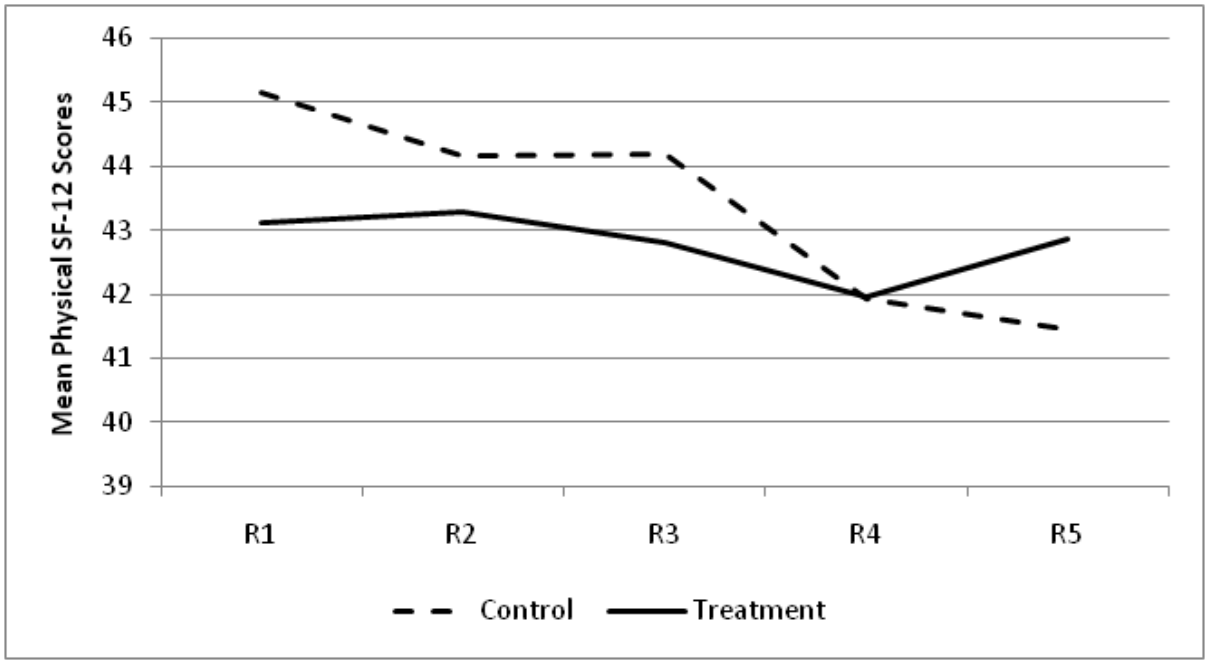
*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

Regressions assessing the number of ADLs or IADLs reported produced generally the same results as our estimation of the impacts of the DMIE on the presence of any ADL or IADL limitations (Appendix Tables D.2 and D.3). Among those receiving DMIE intervention services, there was a decline in the number of ADLs (insignificant) and IADLs (significant) in Hawaii, an increase in the number of functional limitations in Kansas, and no significant impacts in Minnesota or Texas.

The DMIE contributed to improvements in physical health, mental health, and functional status among treatment group participants relative to the control group in Hawaii. Kansas treatment group participants, on the other hand, were found to have experienced insignificant but noteworthy declines in several measures of health and functioning. No effects were found in Minnesota or Texas.

In all states, the relatively short time frame over which we observe participants should also be taken into consideration. The up to two-year window over which we observe DMIE participants may be too short to observe the positive benefits of the program. State evaluators in Texas found improved access to and use of health services 18 months after DMIE enrollment (Bohman et al. 2011). Health improvements stemming from higher health care utilization rates may be recognized in the future. A recent study by evaluators in Kansas compared unadjusted average physical SF-12 scores between the treatment and control groups using two additional rounds of data, Rounds 4 and 5 (Hall et al. 2011).[17] Over this extended time period, the treatment group was observed to have significant improvements in health relative to the control group (Figure IV.1). Although the study results focus on physical SF-12 scores, it is likely that functional status experiences a similar trajectory.

Figure IV.1: Mean Physical SF-12 Scores in Kansas over Five Rounds of Data



Source: Hall et al. 2011.

[17] The Round 4 and 5 survey data were not included in the national DMIE evaluation because the three other participating states did not have a full set of Round 4 and 5 survey data available at the time of this report.

V. DID THE DMIE IMPROVE EMPLOYMENT OUTCOMES?

Nearly all individuals were employed at the beginning of DMIE participation because one of the eligibility criteria was that every participant had to be working at least 40 hours per month. In order to show that the DMIE helped participants to maintain employment, the analysis would have to indicate that a substantial percentage of the control group had stopped working or decreased their intensity of work compared to the treatment group. In this chapter, we evaluate the impact the DMIE had on three measures of employment outcomes: (1) not working in the past month, (2) average hours worked in the past month, and (3) annual earnings.

A. Employment and Monthly Hours Worked

To assess whether DMIE interventions helped participants retain their employment status, we defined employment in two ways: (1) evidence that an individual was not working in the past month and (2) the average number of monthly hours worked in the past month. These indicators are based on self-reported information that participants provided through surveys completed after participating in the program for 12 to 24 months, depending on the state.

Only small declines in employment were experienced over the course of the DMIE interventions. Overall, the share of participants who were not working in the past month was relatively low (about seven percent), indicating that the DMIE populations generally had some employment over multiple periods during the intervention. This is not surprising considering employment was close to 100 percent at baseline, just 12 to 24 months prior. Employment rates remained high in both the treatment and control groups. For example, in the two largest states (Minnesota and Texas), we found that 5.9 percent of the treatment group and 6.1 percent of the control group were not working 24 months after DMIE enrollment (Table V.1).

In each of the states, we found no statistically significant evidence that the DMIE led to differential rates of employment across the treatment and control groups (Table V.1). This suggests that the programs did not have an impact on employment retention. In a prior analysis,

we found a 4.6 percentage point higher employment rate for the treatment relative to the control group in Kansas after eight months, a statistically significant difference (Gimm et al. 2011). Here we found a 3.1 percentage point difference in the employment rate of the treatment and control groups 17 months after enrollment, an insignificant difference. This suggests that impacts on employment retention occurred toward the beginning of the intervention (in the first eight months) rather than between eight and 17 months later, by which time DMIE services had stopped for some enrollees.

Table V.1: Impacts on Percent of DMIE Participants Not Working in the Past Month, 12 to 24 Months After Enrollment, by State

State	Percent Not Employed in Treatment Group (Total number in group)	Percent Not Employed in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	5.9 (1,271)	6.1 (701)	-0.2	0.86
Minnesota	17.7 (625)	17.9 (201)	-0.2	0.96
Texas	1.8 (646)	1.4 (500)	0.4	0.67
Kansas	4.2 (217)	7.3 (234)	-3.1	0.14
Hawaii	5.8 (94)	1.9 (52)	3.9	0.25

Source: UDS submitted by the states. Sample sizes are based on the count of nonmissing responses for the monthly hours worked variable.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Not employed is defined as reporting zero hours worked in the past month; however, this can occur not only if a person loses a job, but also if a person is on vacation or during a medical leave of absence. This measure provides a snapshot of work hours in the past 28 days and therefore does not capture other employment activity during the year.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

One limitation of using this employment measure is that "not working" can be due to a paid vacation, medical leave, or involuntary job loss. In addition, the measure only provides a

snapshot of work in the past 28 days, which does not capture other employment activity during the year. Therefore, some caution is warranted in interpreting these findings.

We also examined differences between groups with respect to average monthly hours worked at the second follow-up contact (12 to 24 months after enrollment, depending on the state). Consistent with the results on employment rates, the DMIE did not lead to statistically significant increases in monthly hours worked for the treatment group relative to the control group in any of the states (Table V.2). In three states, impacts were not statistically significant. It is worth noting that the DMIE intervention coincided with an economic recession, which began in the end of 2007. During this time it may not have been possible for individuals to work for their desired number of hours. Different results may have been found in a different economic climate where workers have more flexibility over hours worked. Similarly, employment benefits may be realized in the future as the economy recovers.

However, in one state, Hawaii, the difference was significant—but in the opposite direction of what was expected. The treatment group reported working 132 hours, compared with 156 hours in the control group, a decline of almost 24 hours per month one year after enrollment. This is consistent with a previous impact analysis of Hawaii, which found that treatment group participants worked 31 fewer hours than the control group six months after enrollment (Ireys et al. 2010; Gimm et al. 2011). While the exact reason for this result is unknown, Hawaii program staff have suggested it could be due to some treatment group participants seeking to improve "work-life balance," which may have resulted in fewer hours worked. We also found that 2007 enrollees in Texas as well as 2008 enrollees in Kansas experienced increases in their monthly hours worked, but these positive impacts ($p<.10$) were not significant (Appendix Table A.3).

Table V.2: Impacts on Average Monthly Hours Worked in the Past Month, 12 to 24 Months After Enrollment, by State

State	Average Hours Worked in Treatment Group (Total number in group)	Average Hours Worked in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	119.9 (1,271)	117.6 (701)	2.3	0.46
Minnesota	102.5 (625)	104.3 (201)	-1.8	0.77
Texas	127.6 (646)	123.0 (500)	4.6	0.18
Kansas	145.4 (217)	145.8 (234)	-0.4	0.95
Hawaii	131.7 (94)	155.6 (52)	-23.9	0.01

Source: UDS submitted by the states. Sample sizes are based on the count of nonmissing responses for the monthly hours worked variable.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). This information is based on self-reported hours worked in the past month; however, this excludes time on vacation or during a medical leave of absence. This measure provides a snapshot of work hours in the past 28 days, and therefore does not capture other employment activity during the year.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

B. Earnings

Finally, we examined the impact of the DMIE interventions on the annual earnings of participants in the calendar year after enrollment using SSA's Master Earnings File. Since the SSA earnings data are based on W-2 forms for tax reporting purposes, they include the total amount of wages subject to Medicare taxes in a calendar year. However, the length of exposure to the DMIE will vary for participants based on their month of enrollment. For example, a participant enrolled in January 2007 will have been receiving services for a full year prior to 2008, the year in which earnings are analyzed. In comparison, a participant enrolled in November 2007 will only have had two months of DMIE exposure prior to 2008.

In Hawaii, the DMIE was not associated with a statistically significant decline in annual earnings (Table V.3). The lack of an impact in Hawaii is surprising given the large decline in self-reported monthly hours worked. This may be partially attributable to the different time frames covered by our measures of hours worked and earnings. Hours worked were measured for a one-month period one year after DMIE enrollment. The surveys were completed after June 2009 for 78 percent of participants. However, annual earnings covered all work during calendar year 2009. Accordingly, it is possible that employment changes occurring later in the year have not been fully captured by our measure of annual earnings. Also, most participants in Hawaii received a fixed annual salary, which could help to explain the lack of impacts on annual earnings despite a change in self-reported hours worked in the past month. Further follow-up is needed to understand the conflicting results in Hawaii.

Table V.3: Impacts on Annual Earnings in the Calendar Year After DMIE Enrollment, by State

State	Average Earnings in Treatment Group (Total number in group)	Average Earnings in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	14,094 (1,776)	14,180 (964)	-86	0.84
Minnesota	14,417 (888)	14,373 (267)	44	0.96
Texas	13,965 (888)	14,040 (697)	-75	0.88
Kansas	29,848 (225)	31,419 (275)	-1,571	0.48
Hawaii	46,733 (124)	47,581 (60)	-848	0.79

Source: 2009 SSA Master Earnings File and UDS submitted by the states. Sample sizes are based on verified SSNs matched to the SSA administrative data.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months).

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year.

In Minnesota, Texas, and Kansas, differences in annual earnings between treatment and control groups were not statistically significant (Table V.3). Coupled with the lack of a

significant improvement in self-reported hours worked, these results suggest that the DMIE intervention did not have a significant positive impact on employment outcomes in the time frame of our analysis. This finding is largely explained by the fact that most participants in both the treatment and control groups worked extensively throughout this period. Hence, the target population for the DMIE may not have been ideal for testing the intervention's effects on employment outcomes.

VI. DID THE DMIE FORESTALL RELIANCE ON DISABILITY BENEFITS?

A primary question of interest to Congress is whether early interventions such as the DMIE can have a positive impact by reducing dependence on federal disability benefits. Policymakers have been especially interested in strategies to reduce the backlog in SSA disability applications and decrease the growing number of DI and SSI beneficiaries (Autor and Duggan 2010). While a number of program initiatives have focused on encouraging return to work after a person is deemed to have an SSA-certified disability, only a tiny fraction of DI beneficiaries (0.5 percent) exit from the disability rolls each year (Liu and Stapleton 2010). In light of the limited success of return-to-work initiatives, the effects of early intervention efforts that prevent or forestall enrollment into SSA's disability programs are especially important to investigate. In this chapter, we present our findings about the impact of the DMIE first on applications to such programs and second on actual receipt of benefits.

A. Applications to Federal Disability Programs

In Minnesota and Texas, a smaller percentage of the treatment group submitted applications within two years after DMIE enrollment compared with the comparison group. Specifically, 10.2 and 12.1 percent of the treatment group in Minnesota and Texas, respectively, applied for SSA disability benefits (Table VI.1); corresponding figures for the control group were 12.0 and 14.5 in the two states, respectively. When data from Minnesota and Texas are combined in the two-state sample, similar results are found. In Kansas, fewer participants applied for disability benefits overall, but again the percentage who applied was lower in the treatment group compared with the control group (3.8 versus 4.4 percent). In all three individual states and in the two-state group, differences between the treatment and comparison groups are not statistically significant when key factors are taken into account (Table VI.1).

Table VI.1: Impact on Federal Disability Applications Within Two Years After DMIE Enrollment, by State

State	Percent Who Apply for Disability Benefits in Treatment Group (Total number in group)	Percent Who Apply for Disability Benefits in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	11.7 (1,776)	13.8 (964)	-2.1	0.14
Minnesota	10.2 (888)	12.0 (267)	-1.8	0.40
Texas	12.1 (888)	14.5 (697)	-2.4	0.18
Kansas	3.8 (225)	4.4 (275)	-0.6	0.70
Hawaii	2.8 (124)	0.0 (60)	2.8	0.06

Source: SSA 831 files on applications and UDS submitted by the states. Sample sizes are based on verified SSNs matched to the SSA administrative data.

Notes: The two states in the first row are Minnesota and Texas.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, federal disability benefit receipt at the time of DMIE enrollment, hours worked and occupation at the time of enrollment, and number of job changes in the previous year.

Analysis of Hawaii's data yields a different result (Table VI.1). In Hawaii, compared with the control group, proportionally more of the treatment group applied for disability benefits within two years of DMIE enrollment (2.7 percent of the treatment group versus 0 percent of the control group). This difference is not statistically significant and the reasons for this outcome are not known.

B. Receipt of Federal Disability Benefits

We examined the impact of DMIE services on the receipt of SSDI and SSI benefits one year after DMIE enrollment. Based on SSA data on benefits received through December 2009, our results showed that proportionally fewer members of the treatment group in the two-state sample received such benefits compared with the control group: 2.8 versus 4.3 percent, which is a statistically significant difference (Table VI.2). The pattern was the same in these two states individually, but only in Texas was the difference between the treatment and control groups (2.0

versus 4.0) statistically significant. In Kansas there was no difference between the two groups. In Hawaii, no participant in either the treatment or control group received disability benefits within the 12-month period.

Table VI.2: Impact on Receipt of Federal Disability Benefits Within One Year After DMIE Enrollment, by State

State	Percent Who Receive Disability Benefits in Treatment Group (Total number in group)	Percent Who Receive Disability Benefits in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	1.8 (1,776)	3.2 (964)	-1.4	0.04
Minnesota	0.8 (888)	1.1 (267)	-0.3	0.73
Texas	2.0 (888)	4.0 (697)	-2.0	0.03
Kansas	1.5 (225)	1.5 (275)	0.0	0.99
Hawaii	--	--	--	--

Source: 2009 SSA Ticket Research File and UDS submitted by the states. Sample sizes are based on verified SSNs matched to the SSA administrative data.

Notes: The two states in the first row are Minnesota and Texas. In Hawaii, no eligible participants received benefits in this time period.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, federal disability benefit receipt at the time of DMIE enrollment, hours worked and occupation at the time of enrollment, and number of job changes in the previous year.

We also separately examined impacts of the DMIE on receipt of SSDI and SSI benefits. While the SSDI program is focused on working-age adults who have a prior work history, the SSI program provides assistance to lower-income beneficiaries who are not required to have a history of labor force participation (GAO Report 2003). In the two-state and state-specific analyses, we found no evidence of statistically significant differences on SSDI benefit receipt within one year after DMIE enrollment (Table VI.3). We were able to use data on receipt of benefits only through December 2009 because that was the most current information available. In light of the time required for processing SSDI applications, analysis of data over a longer time period may yield different results.

Table VI.3: Impact on Receipt of SSDI Benefits Within One Year After DMIE Enrollment, by State

State	Percent Who Receive SSDI in Treatment Group (Total number in group)	Percent Who Receive SSDI in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	1.7 (1,776)	2.4 (964)	-0.7	0.27
Minnesota	0.8 (888)	1.1 (267)	-0.3	0.73
Texas	1.8 (888)	2.8(697)	-1.0	0.23
Kansas	1.5 (225)	1.5 (275)	0.0	0.99
Hawaii	--	--	--	--

Source: 2009 SSA Ticket Research File and UDS submitted by the states. Sample sizes are based on verified SSNs matched to the SSA administrative data.

Notes: The two states in the first row are Minnesota and Texas. In Hawaii, no eligible participants received benefits in this time period.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, federal disability benefit receipt at the time of DMIE enrollment, hours worked and occupation at the time of enrollment, and number of job changes in the previous year.

In the two state sample, proportionately fewer members of the treatment group received SSI benefits compared with the control group (1.6 versus 2.7 percent); this difference is statistically significant (Table VI.4). We found a similar pattern in both Minnesota (0.7 versus 1.1 percent) and in Texas (1.7 versus 3.3 percent). The difference between groups in Texas is statistically significant. Neither Kansas nor Hawaii had any SSI recipients within 12 months after DMIE enrollment.

Overall, our results suggest that an early intervention program such as the DMIE can produce impacts within 12 months. Compared with similar individuals who were not enrolled in the DMIE interventions, fewer DMIE participants submitted federal disability benefit applications (Gimm et al. 2011) and fewer actually received disability payments. The strongest findings were concentrated in Minnesota and Texas. Participants in these states were somewhat more vulnerable and had more tenuous connections to the labor force than participant in the

other two states, suggesting that early interventions may be more successful when focused on workers with a relatively weak attachment to the labor force.

Table VI.4: Impact on Receipt of SSI Benefits Within One Year After DMIE Enrollment, by State

State	Percent Who Receive SSI in Treatment Group (Total number in group)	Percent Who Receive SSI in Control Group (Total number in group)	Difference (Impact)*	P-Value
Two States	1.6 (1,776)	2.7 (964)	-1.1	0.04
Minnesota	0.7 (888)	1.1 (267)	-0.4	0.59
Texas	1.7 (888)	3.3 (697)	-1.6	0.05
Kansas	n/a	n/a	n/a	n/a
Hawaii	n/a	n/a	n/a	n/a

Source: 2009 SSA Ticket Research File and UDS submitted by the states. Sample sizes are based on verified SSNs matched to the SSA administrative data.

Notes: The two states in the first row are Minnesota and Texas.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, federal disability benefit receipt at the time of DMIE enrollment, hours worked and occupation at the time of enrollment, and number of job changes in the previous year.

To test this hypothesis, we analyzed outcomes for a subset of participants in Kansas who worked 90 or fewer hours per week at the time of DMIE enrollment (not shown).[18] Within this group, the DMIE was associated with a decline in SSA applications of 5.9 percentage points (p=0.18) and a decline of 1.5 percentage points (p=0.47) in receipt of benefits. However, these results are not statistically significant and are sensitive to the threshold level of hours worked. Analyses are based on a small sample size (N=110); a larger sample is likely needed to show significance. Still, these results are suggestive that early intervention services may be effective for individuals with weak labor force attachments.

[18] DMIE participants in Kansas worked in average of 149 hours.

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VII. SUMMARY AND IMPLICATIONS

A. Summary of Key Findings

Findings from the national DMIE evaluation showed evidence of positive impacts on health outcomes in some states. In Minnesota, participants in the treatment group experienced significant increases in their mental health (SF-12) scores relative to the control group 24 months after enrollment. In Texas, results varied by the year of enrollment. Although Texas participants who enrolled in 2008 had significantly higher physical health (SF-12) scores after 24 months ($p<.01$), we also found evidence that 2007 enrollees in Texas had lower physical health (SF-12) scores ($p=.045$). In Hawaii, participants had experienced improvements in both mental health and physical health scores but these results were not significant ($p<.10$). Results on functional outcomes were mixed. In Hawaii, participants experienced improvements, with a lower number of IADL limitations 12 months after DMIE enrollment. However, participants in Kansas reported a higher number of ADL limitations.

Analysis of data on participant employment outcomes also yielded mixed results. Similar to previous results estimated 12 months after DMIE enrollment, we did not find any impacts on employment after 24 months. Likewise, we did not find any significant impacts on annual earnings in the calendar year after DMIE enrollment. However, we observed mixed results on monthly hours worked. In Texas for the 2007 enrollees, and in Kansas for the 2008 enrollees, we found evidence of increases in monthly hours worked ($p<.10$). In Hawaii, the groups differed significantly, but in the opposite direction of our hypothesis; that is, the control group reported working more hours than the treatment group.

Several DMIE interventions were found to have beneficial impacts on reducing reliance on SSA disability benefits. Combining data for the two largest state programs, we found in a previous study (Gimm et al. 2011) that 4.8 percent of the treatment group had applied for federal disability benefits compared to 6.9 percent of the control group. Using an additional year of

data, we observed the same pattern, with a lower percentage of the treatment group applying for disability benefits (11.7 versus 13.8 percent) within 24 months, although this difference was no longer significant (p=.14). We also found significant differences in the percentage of participants receiving SSA benefits after 12 months in Texas (2.0 versus 4.0 percent) and in the two-state sample (1.8 versus 3.2 percent). In Hawaii, no participants received SSA benefits and in Kansas the DMIE had no detectable impact.

B. Study Limitations

This study had a number of limitations. First, we examined the impacts of the state programs 12 to 24 months after participants enrolled—a limited time period in which to observe changes in health status, employment outcomes, and receipt of disability benefits. For some participants, this period included a few months when DMIE services (which ended in September 2009) were no longer in effect. If the DMIE intervention's effect did not persist after services ended, then variation in the timing of the last survey interview may have influenced our results. Enrollment in the DMIE programs began in April 2006 and concluded on September 30, 2008; however, most participants enrolled between April and September 2008. To standardize the observation period for all individuals, we analyzed whether participants had submitted a disability application within 24 months after enrollment, as well as disability benefits received within 12 months of enrollment.[19]

Second, using positive hours worked as a measure of employment may overestimate the number of people who are employed. Based on this definition, a person working only one hour a week is considered to be employed. Therefore, some caution is warranted in interpreting the effect of the DMIE intervention on employment.

[19] SSA data on applications were available through December 2010 but SSA data on benefits received were only available through the end of 2009.

Third, we cannot measure the effects of individual components of the early intervention package (for example, person-centered case management, enhanced health services, and employment supports), since the study was not designed to test different service packages or the comparative effectiveness of individual services. Accordingly, our impact estimates account for the entire package of services provided by the DMIE and cannot be attributed to any one benefit.

Finally, the DMIE study populations were uniquely recruited to meet each state's eligibility criteria and therefore do not represent the entire population of working-age adults with potentially disabling conditions within each state. These results may therefore not be generalizable to other working-age adult populations.

C. Policy Implications

Targeting early interventions in vulnerable, at-risk populations can be effective in successfully preventing or forestalling dependence on federal disability benefits. Results from the national DMIE evaluation show that within 12 months an early intervention program can have a significant impact on reducing disability applications as well as on preventing or forestalling the receipt of SSA benefits. In a combined sample of participants in Minnesota and Texas, where the 12-month impacts of the DMIE on disability applications were statistically significant for 2008 enrollees and receipt of SSA benefits was statistically significant for all cohorts, the populations included vulnerable, low-income adults who were at high risk of applying for disability benefits. In both states, most participants had severe mental illness and/or other mental health conditions.

Federal and state policymakers may wish to consider early intervention pilot studies that target lower-income workers who are at greater risk of applying for disability benefits. However, some adults may be in a very advanced stage of disability with severe impairments such that work is no longer feasible. Early intervention programs are not designed for these

adults. Nor are they intended for healthy adults who are not at risk of applying for disability benefits. Rather, targeting adult workers in the middle of the continuum may yield the strongest impacts.

Although it is difficult to calculate the magnitude of future benefits, our findings suggest that for vulnerable populations, the DMIE program may prevent or delay applications to and possibly enrollment in disability programs, which could result in reduced federal outlays of cash payments. In turn, such a reduction may help to offset some portion of the costs for DMIE services.[20] Moreover, maintaining employment can produce many personal and social benefits, including greater financial independence, increased social and community participation, and additional tax revenues.

[20] Assuming that differences in rates of SSDI and SSI receipt in the treatment and control groups persist, evaluators in Texas postulated that a savings of over $1.5 million would be recognized in that state alone (Bohman et al. 2010). However, if the intervention delayed benefit receipt (as opposed to preventing it) the cost savings would be smaller.

Early intervention services that build upon or wraparound existing programs to address the problem of underinsurance can be a cost-effective strategy to help participants maintain independence. Adults with unmet needs for medical services may give up and turn to federal disability benefits as a last resort pathway to Medicare coverage, which is offered to SSDI beneficiaries after a two-year waiting period. In addition, Medicaid is provided to SSI beneficiaries in most states.[21] By offering wraparound services through an early intervention, policymakers may be able to forestall disability applications by getting at the root problem of coverage for needed services. The DMIE initiative builds on existing insurance programs by providing wraparound medical services and employment supports; it is not an insurance program in itself. Consequently, it provides an option that may be especially salient as health insurance reform is implemented by states over the next several years. Even with Medicaid expansions in 2014 and the rise of state health insurance exchanges that seek to reduce uninsurance, the problem of underinsurance is likely to persist.

As an add-on for qualifying individuals within an existing insurance plan, an early intervention program can address the problem of underinsurance for working adults with disabling conditions while also promoting the goal of maintaining employment. Although these findings suggest a modest but positive impact of the DMIE, the overall weight of evidence suggests further consideration of early intervention efforts, especially if they can be made available to the appropriate group of individuals who are already insured. With a large and growing population of adults with potentially disabling conditions, even a small effect size is likely to produce substantial cost savings over time from a societal perspective.

[21] Eleven states have eligibility rules for Medicaid that differ from SSA's SSI rules. These states and seven others also have applications for Medicaid that are separate from SSI.

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APPENDIX A

IMPACT RESULTS BY YEAR OF ENROLLMENT & BASELINE HOURS WORKED

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Table A.1: Impacts on Physical SF-12 Score, 12 to 24 Months after Enrollment, by State and Enrollment Year

State	Average Physical SF-12 Score in Treatment Group (total number in group)	Average Physical SF-12 Score in Control Group (total number in group)	Difference (Impact)*	P-Value
Enrollment in 2006				
Kansas	42.9 (116)	44.0 (91)	-1.1	0.45
Enrollment in 2007				
Two States	39.3 (630)	40.6 (371)	-1.3	0.04
Minnesota	45.9 (273)	46.7 (85)	-0.8	0.51
Texas	37.4 (357)	38.8 (286)	-1.4	0.05
Kansas	43.8 (74)	44.8 (83)	-1.0	0.55
Enrollment in 2008				
Two States	40.6 (836)	39.4 (464)	1.1	0.05
Minnesota	47.1 (374)	47.5 (115)	-0.4	0.72
Texas	38.6 (462)	36.7 (349)	1.8	0.00
Kansas	46.0 (27)	46.7 (60)	-0.7	0.75
Hawaii	48.2 (91)	45.4 (53)	2.8	0.09

Source: UDS submitted by the states.

Notes: Only Kansas had participants who enrolled in 2006. All Hawaii Participants enrolled in 2008.The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). SF-12 scores are population norm-based at 50, the nationwide average. Every 10 points is a standard deviation. Lower scores indicate worse functioning or status.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

Table A.2: Impacts on Percent of DMIE Participants Reporting any ADL Limitations, 12 to 24 Months after Enrollment, by State and Enrollment Year

State	Any ADL Limitations in Treatment Group (%) (total number in group)	Any ADL Limitations in Control Group (%) (total number in group)	Difference (Impact)*	P-Value
Enrollment in 2006				
Kansas	50.1 (116)	45.1 (91)	5.1	0.47
Enrollment in 2007				
Two States	40.7 (644)	39.8 (377)	0.9	0.79
Minnesota	45.5 (285)	37.4 (91)	8.1	0.17
Texas	38.0 (359)	40.6 (286)	-2.6	0.52
Kansas	51.2 (74)	34.9 (83)	16.2	0.04
Enrollment in 2008				
Two States	39.4 (856)	41.0 (471)	-1.6	0.57
Minnesota	40.6 (394)	41.0 (122)	-0.4	0.94
Texas	38.5 (462)	41.0 (349)	-2.5	0.47
Kansas	34.0 (27)	35.0 (60)	-1.0	0.92
Hawaii	33.7 (92)	43.4 (53)	-9.7	0.26

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Activities of daily living (ADL) include bathing, dressing, eating, getting out of bed, walking, going outside, and using the toilet.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

Table A.3: Impacts on Average Monthly Hours Worked in the Past Month, 12 to 24 Months after Enrollment, by State and Enrollment Year

State	Average Hours Worked in Treatment Group (total number in group)	Average Hours Worked in Control Group (total number in group)	Difference (Impact)*	P-Value
Enrollment in 2006				
Kansas	161.6 (116)	168.3 (91)	-6.7	0.45
Enrollment in 2007				
Two States	120.9 (542)	114.4 (318)	6.5	0.12
Minnesota	102.5 (257)	102.9 (86)	-0.4	0.96
Texas	127.4 (285)	118.6 (232)	8.8	0.07
Kansas	131.9 (74)	136.4 (83)	-4.5	0.69
Enrollment in 2008				
Two States	119.2 (729)	120.3 (383)	-1.1	0.81
Minnesota	102.5 (368)	105.3 (115)	-2.8	0.76
Texas	127.6 (361)	126.7 (268)	0.9	0.85
Kansas	150.5 (27)	124.7 (60)	25.8	0.07
Hawaii	131.7 (94)	155.6 (52)	-23.9	0.01

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months).

This information is based on self-reported hours worked in the past month; however, this excludes time on vacation or during a medical leave of absence. This measure provides a snapshot of work hours in the past 28 days, and therefore does not capture other employment activity during the year.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses account for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey nonresponse in the two groups.

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APPENDIX B

STATE-SPECIFIC TABLES

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Table B.1: Baseline Demographic Characteristics of Kansas DMIE Participants, by Group

	Kansas Total n=500	Kansas Treatment n=225	Kansas Control n=275	Kansas Difference	Kansas P-Value
Age at Enrollment					0.5136
Less than 35 year	6.4	4.9	7.6	-2.7	
35-44 years	12.2	13.8	10.9	2.9	
45-54 years	37.8	37.8	37.8	0.0	
55 years or older	43.6	43.6	43.6	-0.1	
Missing	0.0	0.0	0.0	0.0	
Gender					0.2929
Female	50.6	48.0	52.7	-4.7	
Male	49.4	52.0	47.3	4.7	
Missing	0.0	0.0	0.0	0.0	
Race/Ethnicity					0.3312
White and Non-Hispanic	96.0	96.4	95.6	0.8	
Black or African American	0.4	0.9	0.0	0.9	
Hispanic	1.8	1.3	2.2	-0.8	
Asian	0.4	0.0	0.7	-0.7	
Other/Multiple Races	1.4	1.3	1.5	-0.1	
Missing	0.0	0.0	0.0	0.0	
Education					0.2927
Less than high school	1.8	1.8	1.8	0.0	
High school graduate or GED	18.0	19.6	16.7	2.8	
Some college or 2-year degree	35.6	39.1	32.7	6.4	
At least 4-year college graduate	44.4	39.6	48.4	-8.8	
Missing	0.2	0.0	0.4	-0.4	
Marital Status					0.1663
Married	54.6	57.8	52.0	5.8	
Widowed, divorced, or separated	25.2	22.7	27.3	-4.6	
Never married	19.4	19.6	19.3	0.3	
Missing	0.8	0.0	1.5	-1.5	

Source: Uniform data set (UDS) submitted by Kansas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.2: Baseline Health Characteristics of Kansas DMIE Participants, by Group

	Kansas Total n=500	Kansas Treatment n=225	Kansas Control n=275	Kansas Difference	Kansas P-Value
Mental Health SF-12 Score *					
Average MHCS Score	50.3	49.9	50.7	-0.8	0.3605
Missing (N)	0	0	0	0	
Physical Health SF-12 Score *					
Average PHCS Score	44.8	43.5	45.8	-2.3	0.0286
Missing (N)	0	0	0	0	
Number of Limited ADLs					0.3453
Zero limited activities	58.0	54.7	60.7	-6.1	
1 limited activity	17.4	17.8	17.1	0.7	
2 limited activities	10.4	12.9	8.4	4.5	
3 or more limited activities	14.2	14.7	13.8	0.8	
Missing	0.0	0.0	0.0	0.0	
Number of Limited IADLs					0.0522
Zero limited activities	56.6	53.8	58.9	-5.1	
1 limited activity	22.6	20.0	24.7	-4.7	
2 limited activities	10.6	13.8	8.0	5.8	
3 or more limited activities	10.2	12.4	8.4	4.1	
Missing	0.0	0.0	0.0	0.0	
Primary Diagnostic Conditions					
Mental Illness	36.4	33.8	38.5	-4.7	0.2712
Musculoskeletal Conditions	33.4	36.0	31.3	4.7	0.2658
Diabetes	25.4	26.7	24.4	2.3	0.5571
Cardiovascular Conditions	24.4	22.7	25.8	-3.1	0.4154
Respiratory Conditions	18.4	18.2	18.5	-0.3	0.9262
Cancer	15.2	16.0	14.5	1.5	0.6530
Other	32.4	33.3	31.6	1.7	0.6874
Health Care Service Use					
Number of Preventive Care Visits	2.0	2.3	1.8	0.5	0.0255
Number of Vision/Dentist Visits	1.7	1.8	1.6	0.2	0.2066
Number of Treatment/Surgery Visits	2.5	2.1	2.8	-0.7	0.3146
Number of Mental Care Visits	2.9	2.0	3.7	-1.7	0.2418

Source: Uniform data set (UDS) submitted by Kansas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

*SF-12 scores are population norm-based at 50 (national average). Every 10 points is a standard deviation. Lower scores indicate worse functioning or health status.

Table B.3: Baseline Employment Characteristics of Kansas DMIE Participants, by Group

	Kansas Total n=500	Kansas Treatment n=225	Kansas Control n=275	Kansas Difference	Kansas P-Value
Industry of Employment					0.4158
Education and healthcare	19.6	18.7	20.4	-1.7	
Trade, transportation, utilities	16.0	16.4	15.6	0.8	
Leisure and hospitality	7.2	4.9	9.1	-4.2	
Professional services	19.8	21.3	18.5	2.8	
All other industries	37.4	38.7	36.4	2.3	
Missing	0.0	0.0	0.0	0.0	
Job Type					0.3512
Professional, Tech, Managerial	38.8	38.7	38.9	-0.2	
Clerical and Sales	21.2	20.9	21.5	-0.6	
Service Occupations	15.0	12.4	17.1	-4.6	
All other job types	25.0	28.0	22.5	5.5	
Missing	0.0	0.0	0.0	0.0	
Job Change Frequency					0.4264
No job changes	89.6	91.6	88.0	3.6	
1 job change	7.8	6.2	9.1	-2.9	
2 or more job changes	2.6	2.2	2.9	-0.7	
Missing	0.0	0.0	0.0	0.0	
Average Hours Worked	148.4	147.8	148.9	-1.1	0.8816
Monthly Hours Worked					0.0237
Less than half time	17.8	16.4	18.9	-2.5	
Between half and full-time	33.2	39.6	28.0	11.6	
At least full-time	49.0	44.0	53.1	-9.1	
Missing	0.0	0.0	0.0	0.0	

Source: Uniform data set (UDS) submitted by Kansas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.4: Program Characteristics of Kansas DMIE Participants, by Group

	Kansas Total n=500	Kansas Treatment n=225	Kansas Control n=275	Kansas Difference	Kansas P-Value
DMIE Enrollment Period					<.0001
2006 second half	44.4	54.2	36.4	17.9	
2007 first half	33	33.3	32.7	0.6	
2007 second half	0	0	0	0	
2008 first half	0	0	0	0	
2008 second half	22.6	12.4	30.9	-18.5	
DMIE Withdraws					<.0001
Withdrawals from DMIE at any point	22.8	10.7	32.7	-22.1	
Continuously enrolled	77.2	89.3	67.3	22.1	
Duration of Enrollment					
Months since DMIE enrollment at UDS 3	17.0	17.0	17.1	0.0	0.7033
Survey Completion Status					--
Completed Surveys 1, 2, and 3	100.0	100.0	100.0	100.0	
Did not complete one or more surveys	0.0	0.0	0.0	0.0	
Stop Date Relative to UDS					<.0001
DMIE Stop *before* UDS 3 survey date	21.0	13.4	28.3	-14.9	
DMIE Stop *on or after* UDS 3 survey date	67.1	82.7	52.4	30.3	
DMIE Stop Date or Survey Date Missing	11.8	4.0	19.3	-15.4	

Source: Uniform data set (UDS) submitted by Kansas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.5: Baseline Demographic Characteristics of Minnesota DMIE Participants, by Group

	Minnesota Total n=1,155	Minnesota Treatment n=888	Minnesota Control n=267	Minnesota Difference	Minnesota P=Value
Age at Enrollment					0.8894
Less than 35 year	42.0	41.7	43.1	-1.4	
35-44 years	22.9	22.6	23.6	-1.0	
45-54 years	25.8	26.4	24.0	2.4	
55 years or older	9.4	9.3	9.4	0.0	
Missing	0.0	0.0	0.0	0.0	
Gender					0.6330
Female	60.8	60.8	60.7	0.1	
Male	39.0	38.9	39.3	-0.5	
Missing	0.3	0.3	0.0	0.3	
Race/Ethnicity					0.6590
White and Non-Hispanic	77.9	79.6	72.3	7.3	
Black or African American	8.7	8.4	9.4	-0.9	
Hispanic	3.1	2.8	4.1	-1.3	
Asian	0.8	0.8	0.7	0.0	
Other/Multiple Races	5.6	5.5	6.0	-0.5	
Missing	3.9	2.8	7.5	-4.7	
Education					0.9740
Less than high school	6.3	6.3	6.4	-0.1	
High school graduate or GED	26.1	26.1	26.2	-0.1	
Some college or 2-year degree	45.0	45.6	43.1	2.5	
At least 4-year college graduate	19.1	19.5	18.0	1.5	
Missing	3.4	2.5	6.4	-3.9	
Marital Status					0.3849
Married	22.3	21.8	24.0	-2.1	
Widowed, divorced, or separated	28.4	28.4	28.5	-0.1	
Never married	45.7	47.2	40.8	6.4	
Missing	3.6	2.6	6.7	-4.2	

Source: Uniform data set (UDS) submitted by Minnesota. The sample excludes Minnesota participants who enrolled on or after May 1, 2008 because the state changed procedures for assigning participants to the treatment and control groups.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.6: Baseline Health Characteristics of Minnesota DMIE Participants, by Group

	Minnesota Total n=1,155	Minnesota Treatment n=888	Minnesota Control n=267	Minnesota Difference	Minnesota P=Value
Mental Health SF-12 Score *					
Average MHCS Score	35.1	35.2	34.7	0.5	0.5457
Missing (N)	92	61	31	30	
Physical Health SF-12 Score *					
Average PHCS Score	47.9	47.7	48.6	-0.9	0.2312
Missing (N)	92	61	31	30	
Number of Limited ADLs					0.4112
Zero limited activities	53.2	53.9	50.6	3.4	
1 limited activity	17.9	18.8	15.0	3.8	
2 limited activities	9.4	8.9	11.2	-2.3	
3 or more limited activities	15.8	15.8	15.7	0.0	
Missing	3.7	2.6	7.5	-4.9	
Number of Limited IADLs					0.2636
Zero limited activities	43.4	43.6	42.7	0.9	
1 limited activity	17.2	17.9	15.0	2.9	
2 limited activities	12.6	13.5	9.7	3.8	
3 or more limited activities	23.7	23.0	26.2	-3.2	
Missing	3.0	2.0	6.4	-4.3	
Primary Diagnostic Conditions					0.8001
Severe Mental Illness	49.1	48.9	49.8	-0.9	
All Other	50.9	51.1	50.2	0.9	
Health Care Service Use					
Number of Preventive Care Visits	2.9	2.9	3.0	-0.2	0.7282
Number of Vision/Dentist Visits	1.0	1.0	1.1	0.0	0.8786
Number of Treatment/Surgery Visits	1.6	1.6	1.4	0.2	0.6310
Number of Mental Care Visits	7.2	7.1	7.3	-0.2	0.8395

Source: Uniform data set (UDS) submitted by Minnesota. The sample excludes Minnesota participants who enrolled on or after May 1, 2008 because the state changed procedures for assigning participants to the treatment and control groups.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

*SF-12 scores are population norm-based at 50 (national average). Every 10 points is a standard deviation. Lower scores indicate worse functioning or health status.

Table B.7: Baseline Employment Characteristics of Minnesota DMIE Participants, by Group

	Minnesota Total n=1,155	Minnesota Treatment n=888	Minnesota Control n=267	Minnesota Difference	Minnesota P=Value
Industry of Employment					0.1226
Education and healthcare	20.3	20.3	20.2	0.0	
Trade, transportation, utilities	19.7	20.5	16.9	3.6	
Leisure and hospitality	18.6	17.9	21.0	-3.1	
Professional services	13.0	12.2	15.7	-3.6	
All other industries	22.7	24.0	18.4	5.6	
Missing	5.8	5.2	7.9	-2.7	
Job Type					0.0269
Professional, Tech, Managerial	17.3	15.7	22.8	-7.2	
Clerical and Sales	29.8	30.3	28.1	2.2	
Service Occupations	32.0	33.2	28.1	5.1	
All other job types	14.5	15.1	12.4	2.7	
Missing	6.4	5.7	8.6	-2.9	
Job Change Frequency					0.0826
No job changes	51.9	53.9	44.9	9.0	
1 job change	19.4	18.4	22.8	-4.5	
2 or more job changes	21.9	22.0	21.7	0.2	
Missing	6.8	5.7	10.5	-4.7	
Average Hours Worked	120.8	120.6	121.7	-1.2	0.7404
Monthly Hours Worked					0.8452
Less than half time	15.4	15.2	16.1	-0.9	
Between half and full-time	53.7	54.4	51.3	3.1	
At least full-time	21.9	22.1	21.3	0.7	
Missing	9.0	8.3	11.2	-2.9	

Source: Uniform data set (UDS) submitted by Minnesota. The sample excludes Minnesota participants who enrolled on or after May 1, 2008 because the state changed procedures for assigning participants to the treatment and control groups.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.8: Program Characteristics of Minnesota DMIE Participants, by Group

	Minnesota Total n=1,155	Minnesota Treatment n=888	Minnesota Control n=267	Minnesota Difference	Minnesota P=Value
DMIE Enrollment Period					0.6977
2006 second half	0.0	0.0	0.0	0.0	
2007 first half	13.7	13.6	13.9	-0.2	
2007 second half	28.1	27.5	30.0	-2.5	
2008 first half	58.3	58.9	56.2	2.7	
2008 second half	0.0	0.0	0.0	0.0	
DMIE Withdraws					0.0049
Withdrawals from DMIE at any point	4.7	3.7	7.9	-4.1	
Continuously enrolled	95.3	96.3	92.1	4.1	
Duration of Enrollment					
Months since DMIE enrollment at UDS 3	29.3	29.3	29.3	0.1	0.8368
Survey Completion Status					0.0007
Completed Surveys 1, 2, and 3	96.2	97.5	92.5	5.0	
Did not complete one or more surveys	3.8	2.5	7.5	-5.0	
Stop Date Relative to UDS					0.2904
DMIE Stop *before* UDS 3 survey date	77.4	76.7	79.8	-3.1	
DMIE Stop *on or after* UDS 3 survey date	0.0	0.0	0.0	0.0	
DMIE Stop Date or Survey Date Missing	22.6	23.3	20.2	3.1	

Source: Uniform data set (UDS) submitted by Minnesota. The sample excludes Minnesota participants who enrolled on or after May 1, 2008 because the state changed procedures for assigning participants to the treatment and control groups.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.9: Baseline Demographic Characteristics of Texas DMIE Participants, by Group

	Texas Total n=1,585	Texas Treatment n=888	Texas Control n=697	Texas Difference	Texas P-Value
Age at Enrollment					0.4944
Less than 35 year	10.5	11.4	9.5	1.9	
35-44 years	20.9	20.7	21.1	-0.4	
45-54 years	47.9	46.8	49.4	-2.5	
55 years or older	20.6	21.1	19.9	1.1	
Missing	0.1	0.0	0.1	-0.1	
Gender					0.2294
Female	76.3	77.5	74.9	2.6	
Male	23.7	22.5	25.1	-2.6	
Missing	0.0	0.0	0.0	0.0	
Race/Ethnicity					0.3675
White and Non-Hispanic	23.3	22.0	25.0	-3.0	
Black or African American	41.4	43.7	38.5	5.2	
Hispanic	32.1	31.2	33.1	-1.9	
Asian	1.5	1.6	1.4	0.1	
Other/Multiple Races	1.6	1.5	1.7	-0.3	
Missing	0.2	0.1	0.3	-0.2	
Education					0.4932
Less than high school	30.2	28.9	31.9	-2.9	
High school graduate or GED	31.7	31.8	31.7	0.0	
Some college or 2-year degree	29.5	31.2	27.4	3.8	
At least 4-year college graduate	8.4	8.0	8.9	-0.9	
Missing	0.1	0.1	0.1	0.0	
Marital Status					0.7669
Married	24.7	24.1	25.5	-1.4	
Widowed, divorced, or separated	49.3	50.5	47.8	2.7	
Never married	25.9	25.3	26.5	-1.2	
Missing	0.1	0.1	0.1	0.0	

Source: Uniform data set (UDS) submitted by Texas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.10: Baseline Health Characteristics of Texas DMIE Participants, by Group

	Texas Total n=1,585	Texas Treatment n=888	Texas Control n=697	Texas Difference	Texas P-Value
Mental Health SF-12 Score *					
Average MHCS Score	49.6	49.5	49.7	-0.2	0.7954
Missing (N)	1	1	0	1	
Physical Health SF-12 Score *					
Average PHCS Score	37.9	38.0	37.6	0.4	0.3862
Missing (N)	3	2	1	1	
Number of Limited ADLs					0.7053
Zero limited activities	58.7	59.7	57.4	2.3	
1 limited activity	18.9	18.8	18.9	-0.1	
2 limited activities	10.8	10.6	11.0	-0.5	
3 or more limited activities	11.7	10.9	12.6	-1.7	
Missing	0.0	0.0	0.0	0.0	
Number of Limited IADLs					0.3266
Zero limited activities	50.7	51.1	50.1	1.1	
1 limited activity	20.4	21.6	18.9	2.7	
2 limited activities	11.5	10.7	12.6	-1.9	
3 or more limited activities	17.4	16.6	18.4	-1.8	
Missing	0.0	0.0	0.0	0.0	
Primary Diagnostic Conditions					0.5382
SMI with or without SA	11.0	11.9	9.8	2.2	
Mental Illness with or without SA	44.5	44.3	44.9	-0.6	
OBH with or without SA	29.3	28.5	30.3	-1.8	
Substance Abuse	15.2	15.3	15.1	0.3	
Health Care Service Use					
Number of Preventive Care Visits	4.3	4.5	4.0	0.5	0.1160
Number of Vision/Dentist Visits	1.1	1.1	1.1	0.0	0.7369
Number of Treatment/Surgery Visits	1.1	1.0	1.1	-0.1	0.5174
Number of Mental Care Visits	1.1	1.1	1.1	-0.1	0.8139

Source: Uniform data set (UDS) submitted by Texas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

*SF-12 scores are population norm-based at 50 (national average). Every 10 points is a standard deviation. Lower scores indicate worse functioning or health status.

Table B.11: Baseline Employment Characteristics of Texas DMIE Participants, by Group

	Texas Total n=1,585	Texas Treatment n=888	Texas Control n=697	Texas Difference	Texas P-Value
Industry of Employment					0.4660
Education and healthcare	28.5	30.1	26.5	3.5	
Trade, transportation, utilities	10.1	9.9	10.3	-0.4	
Leisure and hospitality	9.8	9.7	10.0	-0.4	
Professional services	5.8	6.4	5.0	1.4	
All other industries	43.5	41.8	45.8	-4.0	
Missing	2.2	2.1	2.3	-0.2	
Job Type					0.5169
Professional, Tech, Managerial	15.6	16.9	13.9	3.0	
Clerical and Sales	20.4	20.5	20.4	0.1	
Service Occupations	36.4	36.0	36.9	-0.8	
All other job types	21.4	20.4	22.7	-2.3	
Missing	6.2	6.2	6.2	0.0	
Job Change Frequency					0.4569
No job changes	73.1	73.9	72.2	1.7	
1 job change	13.6	14	13.1	0.9	
2 or more job changes	12.9	11.8	14.2	-2.4	
Missing	0.4	0.3	0.6	-0.2	
Average Hours Worked	119.4	120.1	118.5	1.6	0.5936
Monthly Hours Worked					0.5120
Less than half time	23.2	22.0	24.8	-2.9	
Between half and full-time	41.8	43.1	40.0	3.1	
At least full-time	31.2	31.2	31.3	-0.1	
Missing	3.8	3.7	3.9	-0.2	

Source: Uniform data set (UDS) submitted by Texas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.12: Program Characteristics of Texas DMIE Participants, by Group

	Texas Total n=1,585	Texas Treatment n=888	Texas Control n=697	Texas Difference	Texas P-Value
DMIE Enrollment Period					0.9537
2006 second half	0.0	0.0	0.0	0.0	
2007 first half	14.8	14.5	15.1	-0.5	
2007 second half	28.7	28.7	28.7	0.0	
2008 first half	56.5	56.8	56.2	0.5	
2008 second half	0	0.0	0.0	0.0	
DMIE Withdraws					0.0464
Withdrawals from DMIE at any point	0.6	0.9	0.1	0.8	
Continuously enrolled	99.4	99.1	99.9	-0.8	
Duration of Enrollment					
Months since DMIE enrollment at UDS 3	23.9	23.9	23.9	0.0	0.8331
Survey Completion Status					--
Completed Surveys 1, 2, and 3	100.0	100.0	100.0	100.0	
Did not complete one or more surveys	0.0	0.0	0.0	0.0	
Stop Date Relative to UDS					0.5404
DMIE Stop *before* UDS 3 survey date	63.6	64.5	62.4	2.1	
DMIE Stop *on or after* UDS 3 survey date	28.3	27.9	28.7	-0.8	
DMIE Stop Date or Survey Date Missing	8.1	7.5	8.9	-1.4	

Source: Uniform data set (UDS) submitted by Texas.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.13: Baseline Demographic Characteristics of Hawaii DMIE Participants, by Group

	Hawaii Total n=184	Hawaii Treatment n=124	Hawaii Control n=60	Hawaii Difference	Hawaii P-Value
Age at Enrollment					0.1318
Less than 35 year	11.4	12.1	10.0	2.1	
35-44 years	19.6	20.2	18.3	1.8	
45-54 years	38.6	42.7	30.0	12.7	
55 years or older	30.4	25.0	41.7	-16.7	
Missing	0.0	0.0	0.0	0.0	
Gender					0.2139
Female	61.4	64.5	55.0	9.5	
Male	38.6	35.5	45.0	-9.5	
Missing	0.0	0.0	0.0	0.0	
Race/Ethnicity					0.5711
White and Non-Hispanic	17.4	20.2	11.7	8.5	
Black or African American	1.6	1.6	1.7	-0.1	
Hispanic	7.6	6.5	10.0	-3.5	
Asian	34.8	35.5	33.3	2.2	
Other/Multiple Races	38.6	36.3	43.3	-7.0	
Missing	0.0	0.0	0.0	0.0	
Education					0.1116
Less than high school	0.0	0.0	0.0	0.0	
High school graduate or GED	12.0	8.9	18.3	-9.5	
Some college or 2-year degree	37.5	41.1	30.0	11.1	
At least 4-year college graduate	50.5	50.0	51.7	-1.7	
Missing	0.0	0.0	0.0	0.0	
Marital Status					0.3459
Married	52.2	53.2	50.0	3.2	
Widowed, divorced, or separated	20.7	17.7	26.7	-8.9	
Never married	27.2	29.0	23.3	5.7	
Missing	0.0	0.0	0.0	0.0	

Source: Uniform data set (UDS) submitted by Hawaii.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.14: Baseline Health Characteristics of Hawaii DMIE Participants, by Group

	Hawaii Total n=184	Hawaii Treatment n=124	Hawaii Control n=60	Hawaii Difference	Hawaii P-Value
Mental Health SF-12 Score *					
Average MHCS Score	47.4	47.6	46.9	0.7	0.6844
Missing (N)	0	0	0	0	
Physical Health SF-12 Score *					
Average PHCS Score	45.8	45.9	45.6	0.3	0.8466
Missing (N)	0	0	0	0	
Number of Limited ADLs					0.7354
Zero limited activities	56.0	57.3	53.3	3.9	
1 limited activity	15.2	13.7	18.3	-4.6	
2 limited activities	15.8	16.9	13.3	3.6	
3 or more limited activities	13.0	12.1	15.0	-2.9	
Missing	0.0	0.0	0.0	0.0	
Number of Limited IADLs					0.9104
Zero limited activities	46.2	46.0	46.7	-0.7	
1 limited activity	17.4	18.5	15.0	3.5	
2 limited activities	14.7	13.7	16.7	-3.0	
3 or more limited activities	21.7	21.8	21.7	0.1	
Missing	0.0	0.0	0.0	0.0	
Primary Diagnostic Conditions					0.9169
Type 1 Diabetes	12.5	12.9	11.7	1.2	
Type 2 Diabetes	85.3	84.7	86.7	-2.0	
Other Pre-Diabetes	2.2	2.4	1.7	0.8	
Health Care Service Use					
Number of Preventive Care Visits	4.8	4.9	4.6	0.4	0.5946
Number of Vision/Dentist Visits	2.0	1.9	2.2	-0.3	0.2804
Number of Treatment/Surgery Visits	1.8	1.5	2.3	-0.8	0.2197
Number of Mental Care Visits	1.7	0.9	3.3	-2.4	0.0574

Source: Uniform data set (UDS) submitted by Hawaii.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

*SF-12 scores are population norm-based at 50 (national average). Every 10 points is a standard deviation. Lower scores indicate worse functioning or health status.

Table B.15: Baseline Employment Characteristics of Hawaii DMIE Participants, by Group

	Hawaii Total n=184	Hawaii Treatment n=124	Hawaii Control n=60	Hawaii Difference	Hawaii P-Value
Industry of Employment					0.9169
Education and healthcare	38.6	40.3	35.0	5.3	
Trade, transportation, utilities	16.3	14.5	20.0	-5.5	
Leisure and hospitality	4.9	5.6	3.3	2.3	
Professional services	12.5	12.9	11.7	1.2	
All other industries	27.7	26.6	30.0	-3.4	
Missing	0.0	0.0	0.0	0.0	
Job Type					0.8891
Professional, Tech, Managerial	49.5	49.2	50.0	-0.8	
Clerical and Sales	21.2	20.2	23.3	-3.2	
Service Occupations	12.0	12.9	10.0	2.9	
All other job types	17.4	17.7	16.7	1.1	
Missing	0.0	0.0	0.0	0.0	
Job Change Frequency					0.3051
No job changes	83.7	83.1	85.0	-1.9	
1 job change	12	12.1	11.7	0.4	
2 or more job changes	4.3	4.8	3.3	1.5	
Missing	0.0	0.0	0.0	0.0	
Average Hours Worked	154.2	155.5	151.5	4.0	0.6697
Monthly Hours Worked					0.6680
Less than half time	5.4	4.0	8.3	-4.3	
Between half and full-time	39.7	37.9	43.3	-5.4	
At least full-time	54.9	58.1	48.3	9.7	
Missing	0.0	0.0	0.0	0.0	

Source: Uniform data set (UDS) submitted by Hawaii.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

Table B.16: Program Characteristics of Hawaii DMIE Participants, by Group

	Hawaii Total n=184	Hawaii Treatment n=124	Hawaii Control n=60	Hawaii Difference	Hawaii P-Value
DMIE Enrollment Period					0.6250
2006 second half	0.0	0.0	0.0	0.0	
2007 first half	0.0	0.0	0.0	0.0	
2007 second half	0.0	0.0	0.0	0.0	
2008 first half	22.8	21.8	25.0	-3.2	
2008 second half	77.2	78.2	75.0	3.2	
DMIE Withdraws					0.1232
Withdrawals from DMIE at any point	21.7	25.0	15.0	10.0	
Continuously enrolled	78.3	75.0	85.0	-10.0	
Duration of Enrollment					
Months since DMIE enrollment at UDS 3	12.2	12.3	12.2	0.1	0.5655
Survey Completion Status					--
Completed Surveys 1, 2, and 3	100.0	100.0	100.0	0.0	
Did not complete one or more surveys	0.0	0.0	0.0	0.0	
Stop Date Relative to UDS					0.0862
DMIE Stop *before* UDS 3 survey date	11.0	10.3	12.5	-2.2	
DMIE Stop *on or after* UDS 3 survey date	66.3	62.1	75.0	-12.9	
DMIE Stop Date or Survey Date Missing	22.7	27.6	12.5	15.1	

Source: Uniform data set (UDS) submitted by Hawaii.

Note: F tests were used to assess whether baseline characteristics differ between the treatment and control groups.

APPENDIX C

UNADJUSTED IMPACTS AND MEAN OUTCOMES, BY STATE

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Table C.1: Unadjusted Physical SF-12 Scores of DMIE Participants 6 to 12 Months and 12 to 24 Months After Enrollment, by State

Mean Physical Health Score	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	41.9	42.5	40.9	1.6***
24 months After Enrollment	41.2	41.9	39.9	2.0***
Round 2 Sample Size	2,419	1,572	847	
Round 3 Sample Size	2,301	1,466	835	
Minnesota				
12 months After Enrollment	47.4	47.3	47.8	-0.5
24 months After Enrollment	46.8	46.7	47.2	-0.5
Round 2 Sample Size	974	751	223	
Round 3 Sample Size	847	647	200	
Texas				
12 months After Enrollment	38.2	38	38.4	-0.4
24 months After Enrollment	37.9	38.1	37.6	0.5
Round 2 Sample Size	1,445	821	624	
Round 3 Sample Size	1,454	819	635	
Kansas				
8 months After Enrollment	44.2	43.5	44.7	-1.2
17 months After Enrollment	44	43	45	-2.0
Round 2 Sample Size	471	220	251	
Round 3 Sample Size	451	217	234	
Hawaii				
6 months After Enrollment	47.8	48.2	47.1	1.1
12 months After Enrollment	47.3	48.4	45.4	3.0
Round 2 Sample Size	147	94	53	
Round 3 Sample Size	144	91	53	

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). SF-12 scores are population norm-based at 50, the nationwide average. Every 10 points is a standard deviation. Lower scores indicate worse functioning or status.

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.2: Unadjusted Mental SF-12 Scores of DMIE Participants 6 to 12 Months and 12 to 24 Months After Enrollment, by State

Mean Mental Health Score	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	45.6	44.6	47.4	-2.9***
24 months After Enrollment	46.6	45.7	48.2	-2.5***
Round 2 Sample Size	2,419	1,572	847	
Round 3 Sample Size	2,301	1,466	835	
Minnesota				
12 months After Enrollment	38.7	38.9	38.0	0.9
24 months After Enrollment	39.0	39.5	37.3	2.2**
Round 2 Sample Size	974	751	223	
Round 3 Sample Size	847	647	200	
Texas				
12 months After Enrollment	50.2	49.8	50.8	-1.1
24 months After Enrollment	51.1	50.6	51.6	-1.0
Round 2 Sample Size	1,445	821	624	
Round 3 Sample Size	1,454	819	635	
Kansas				
8 months After Enrollment	50.5	50.3	50.6	-0.3
17 months After Enrollment	51.0	51.3	50.7	0.7
Round 2 Sample Size	471	220	251	
Round 3 Sample Size	451	217	234	
Hawaii				
6 months After Enrollment	47.6	48.3	46.4	1.9
12 months After Enrollment	48.8	49.7	47.2	2.6
Round 2 Sample Size	147	94	53	
Round 3 Sample Size	144	91	53	

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). SF-12 scores are population norm-based at 50, the nationwide average. Every 10 points is a standard deviation. Lower scores indicate worse functioning or status.

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.3: Unadjusted Proportion of DMIE Participants Reporting Any ADL Limitations 6 to 12 Months and 12 to 24 Months After Enrollment, by State

Any ADL Limitations	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	0.40	0.39	0.40	-0.01
24 months After Enrollment	0.41	0.41	0.40	0.00
Round 2 Sample Size	2,463	1,607	856	
Round 3 Sample Size	2,348	1,500	848	
Minnesota				
12 months After Enrollment	0.38	0.37	0.43	-0.06
24 months After Enrollment	0.41	0.42	0.39	0.02
Round 2 Sample Size	1,016	785	231	
Round 3 Sample Size	892	679	213	
Texas				
12 months After Enrollment	0.41	0.42	0.39	0.02
24 months After Enrollment	0.40	0.40	0.41	-0.01
Round 2 Sample Size	1,447	822	625	
Round 3 Sample Size	1,456	821	635	
Kansas				
8 months After Enrollment	0.38	0.42	0.35	0.07
17 months After Enrollment	0.44	0.49	0.39	0.10**
Round 2 Sample Size	471	220	251	
Round 3 Sample Size	451	217	234	
Hawaii				
6 months After Enrollment	0.45	0.38	0.57	-0.19**
12 months After Enrollment	0.36	0.32	0.43	-0.12
Round 2 Sample Size	148	95	53	
Round 3 Sample Size	145	92	53	

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Activities of daily living (ADL) include bathing, dressing, eating, getting out of bed, walking, going outside, and using the toilet.

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.4: Unadjusted Proportion of DMIE Participants Reporting Any IADL Limitations 6 to 12 Months and 12 to 24 Months After Enrollment, by State

Any IADL Limitations	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	0.50	0.51	0.48	0.03
24 months After Enrollment	0.50	0.51	0.48	0.02
Round 2 Sample Size	2,463	1,607	856	
Round 3 Sample Size	2,348	1,500	848	
Minnesota				
12 months After Enrollment	0.52	0.52	0.52	0.01
24 months After Enrollment	0.51	0.52	0.49	0.03
Round 2 Sample Size	1,016	785	231	
Round 3 Sample Size	892	679	213	
Texas				
12 months After Enrollment	0.48	0.50	0.47	0.03
24 months After Enrollment	0.49	0.49	0.48	0.01
Round 2 Sample Size	1,447	822	625	
Round 3 Sample Size	1,456	821	635	
Kansas				
8 months After Enrollment	0.44	0.42	0.45	-0.03
17 months After Enrollment	0.51	0.55	0.47	0.09
Round 2 Sample Size	471	220	251	
Round 3 Sample Size	451	217	234	
Hawaii				
6 months After Enrollment	0.49	0.45	0.57	-0.11
12 months After Enrollment	0.48	0.40	0.60	-0.20
Round 2 Sample Size	148	95	53	
Round 3 Sample Size	143	92	53	

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Instrumental activities of daily living (IADL) include preparing meals, shopping, paying bills, using the telephone, heavy housework, light housework, getting to places outside of walking distance, and managing medications.

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.5: Unadjusted Monthly Hours Worked of DMIE Participants 6 to 12 Months and 12 to 24 Months After Enrollment, by State

Mean Monthly Hours Worked	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	121.5	120.7	123.0	-2.3
24 months After Enrollment	115.3	114.0	117.6	-3.6
Round 2 Sample Size	2,141	1,405	736	
Round 3 Sample Size	1,972	1,271	701	
Minnesota				
12 months After Enrollment	114.6	115.4	112.2	3.1
24 months After Enrollment	104.2	104.1	104.3	-0.2
Round 2 Sample Size	925	708	217	
Round 3 Sample Size	826	625	201	
Texas				
12 months After Enrollment	126.7	126.2	127.5	-1.3
24 months After Enrollment	123.3	123.5	123.0	0.5
Round 2 Sample Size	1,216	697	519	
Round 3 Sample Size	1146	646	500	
Kansas				
8 months After Enrollment	141.7	145.5	138.5	7.0
17 months After Enrollment	147.3	148.9	145.8	3.1
Round 2 Sample Size	471	220	251	
Round 3 Sample Size	451	217	234	
Hawaii				
6 months After Enrollment	141.5	131.6	159.7	-28.1***
12 months After Enrollment	139.8	131.0	155.6	-24.7**
Round 2 Sample Size	151	98	53	
Round 3 Sample Size	146	94	52	

Source: UDS submitted by the states.

Notes: Participant's self-reported number of hours worked in the last 28 days at the time of the survey. The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months).

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.6: Unadjusted Percent of DMIE Participants Not Working in the Past Month 6 to 12 Months and 12 to 24 Months After Enrollment, by State (Percentages)

Percent Not Working	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	4.5	5.0	3.5	1.4
24 months After Enrollment	7.8	8.7	6.1	2.5**
Round 2 Sample Size	2,141	1,405	736	
Round 3 Sample Size	1,972	1,271	701	
Minnesota				
12 months After Enrollment	9.5	9.2	10.6	-1.4
24 months After Enrollment	16.3	15.8	17.9	-2.1
Round 2 Sample Size	925	708	217	
Round 3 Sample Size	826	625	201	
Texas				
12 months After Enrollment	0.7	0.7	0.6	0.1
24 months After Enrollment	1.6	1.7	1.4	0.3
Round 2 Sample Size	1,216	697	519	
Round 3 Sample Size	1,146	646	500	
Kansas				
8 months After Enrollment	4.7	2.7	6.4	-3.6*
17 months After Enrollment	5.1	2.8	7.3	-4.5**
Round 2 Sample Size	471	220	251	
Round 3 Sample Size	451	217	234	
Hawaii				
6 months After Enrollment	2.6	4.1	0.0	4.1
12 months After Enrollment	4.8	6.4	1.9	4.5
Round 2 Sample Size	151	98	53	
Round 3 Sample Size	146	94	52	

Source: UDS submitted by the states.

Notes: Employment measured by positive hours worked in the last 28 days at the time of the survey. The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months).

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.7: Unadjusted Proportion of DMIE Participants Submitting Disability Applications 12 and 24 Months After Enrollment, by State (Percentages)

SSA Disability Applications	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	6.1	5.3	7.6	-2.3**
24 months After Enrollment	12.5	11.7	13.9	-2.2*
Sample Size	2,740	1,776	964	
Minnesota				
12 months After Enrollment	4.4	4.1	5.6	-1.6
24 months After Enrollment	10.4	9.9	12.0	-2.1
Sample Size	1,155	888	267	
Texas				
12 months After Enrollment	7.3	6.5	8.3	-1.8
24 months After Enrollment	14.0	13.5	14.6	-1.1
Sample Size	1,585	888	697	
Kansas				
12 months After Enrollment	1.2	0.4	1.8	-1.4
24 months After Enrollment	3.2	1.8	4.4	-2.6
Sample Size	500	225	275	
Hawaii				
12 months After Enrollment	0.5	0.8	0.0	0.8
24 months After Enrollment	1.1	1.6	0.0	1.6
Sample Size	184	124	60	

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months).

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

Table C.8: Unadjusted Proportion of DMIE Participants Receiving Disability Benefits 12 Months After Enrollment, by State (Percentages)

SSA Disability Payments	Full Sample	Treatment Group	Control Group	Difference
Two States				
12 months After Enrollment	3.0	2.3	4.3	-2.0***
Sample Size	2,740	1,776	964	
Minnesota				
12 months After Enrollment	1.1	1.0	1.5	-0.5
Sample Size	1,155	888	267	
Texas				
12 months After Enrollment	4.3	3.5	5.3	-1.8*
Sample Size	1,585	888	697	
Kansas				
12 months After Enrollment	0.8	0.0	1.5	-1.5*
Sample Size	500	225	275	
Hawaii				
12 months After Enrollment	0.0	0.0	0.0	0.0
Sample Size	184	124	60	

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months).

* Indicates significance at the ten percent level, ** indicates significance at the five percent level, and *** indicates significance at the one percent level.

APPENDIX D

ADDITIONAL REGRESSION-ADJUSTED IMPACT TABLES

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Table D.1: Impacts on Percent of DMIE Participants Reporting Specific IADL Limitations in Hawaii, 12 Months after Enrollment

IADL Limitation	Limitation in Treatment Group (%) (N=92)	Limitation in Control Group (%) (N=53)	Difference (Impact)*	P-Value
Meal Preparation	3.6	11.3	-7.7	0.15
Shopping	4.1	15.1	-11.0	0.07
Finances	8.1	22.6	-14.6	0.04
Telephone	3.4	5.7	-2.3	0.50
Heavy Housework	30.3	52.8	-22.5	0.01
Light Housework	11.2	20.8	-9.5	0.17
Transportation	15.7	22.6	-6.9	0.34
Medication Management	12.9	20.8	-7.8	0.26

Source: UDS submitted by the states.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses accounted for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey non-response in the two groups.

Table D.2: Impacts on Number of ADL Limitations Report by DMIE Participants, 12 to 24 Months after Enrollment, by State

State	Average Number of ADLs in Treatment Group (total number in group)	Average Number of ADLs in Control Group (total number in group)	Difference (Impact)*	P-Value
Two States	1.0 (1,500)	1.0 (848)	0.0	0.93
Minnesota	1.1 (679)	1.1 (213)	0.1	0.58
Texas	0.9 (821)	0.9 (635)	0.0	0.72
Kansas	1.1 (217)	0.8 (234)	0.3	0.03
Hawaii	0.9 (92)	1.2 (53)	-0.3	0.30

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Activities of daily living (ADL) include bathing, dressing, eating, getting out of bed, walking, going outside, and using the toilet.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses accounted for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey non-response in the two groups.

Table D.3: Impacts on Number of IADL Limitations Report by DMIE Participants, 12 to 24 Months after Enrollment, by State

State	Average Number of IADLs in Treatment Group (total number in group)	Average Number of IADLs in Control Group (total number in group)	Difference (Impact)*	P-Value
Two States	1.3 (1,500)	1.2 (848)	0.0	0.57
Minnesota	1.4 (679)	1.3 (213)	0.2	0.25
Texas	1.3 (821)	1.3 (635)	0.0	0.85
Kansas	1.0 (217)	0.8 (234)	0.2	0.07
Hawaii	0.9 (92)	1.7 (53)	-0.8	0.01

Source: UDS submitted by the states.

Notes: The two states in the first row are Minnesota and Texas. The average time interval between baseline and Round 3 surveys was approximately 24 months for Minnesota and Texas. The average survey intervals were shorter for Kansas (17 months) and Hawaii (12 months). Instrumental activities of daily living (IADL) include preparing meals, shopping, paying bills, using the telephone, heavy housework, light housework, getting to places outside of walking distance, and managing medications.

*In this column, we report weighted, regression-adjusted impact estimates. This means that our analyses accounted for baseline participant characteristics with respect to age, gender, education, marital status, enrollment year, primary diagnosis, previous SSA applications, hours worked and occupation at the time of enrollment, and number of job changes in the previous year. Estimates are weighted to account for Round 3 survey non-response in the two groups.

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