

## HEALTH CARE EXPENDITURES TWO YEARS POST-TRANSITION

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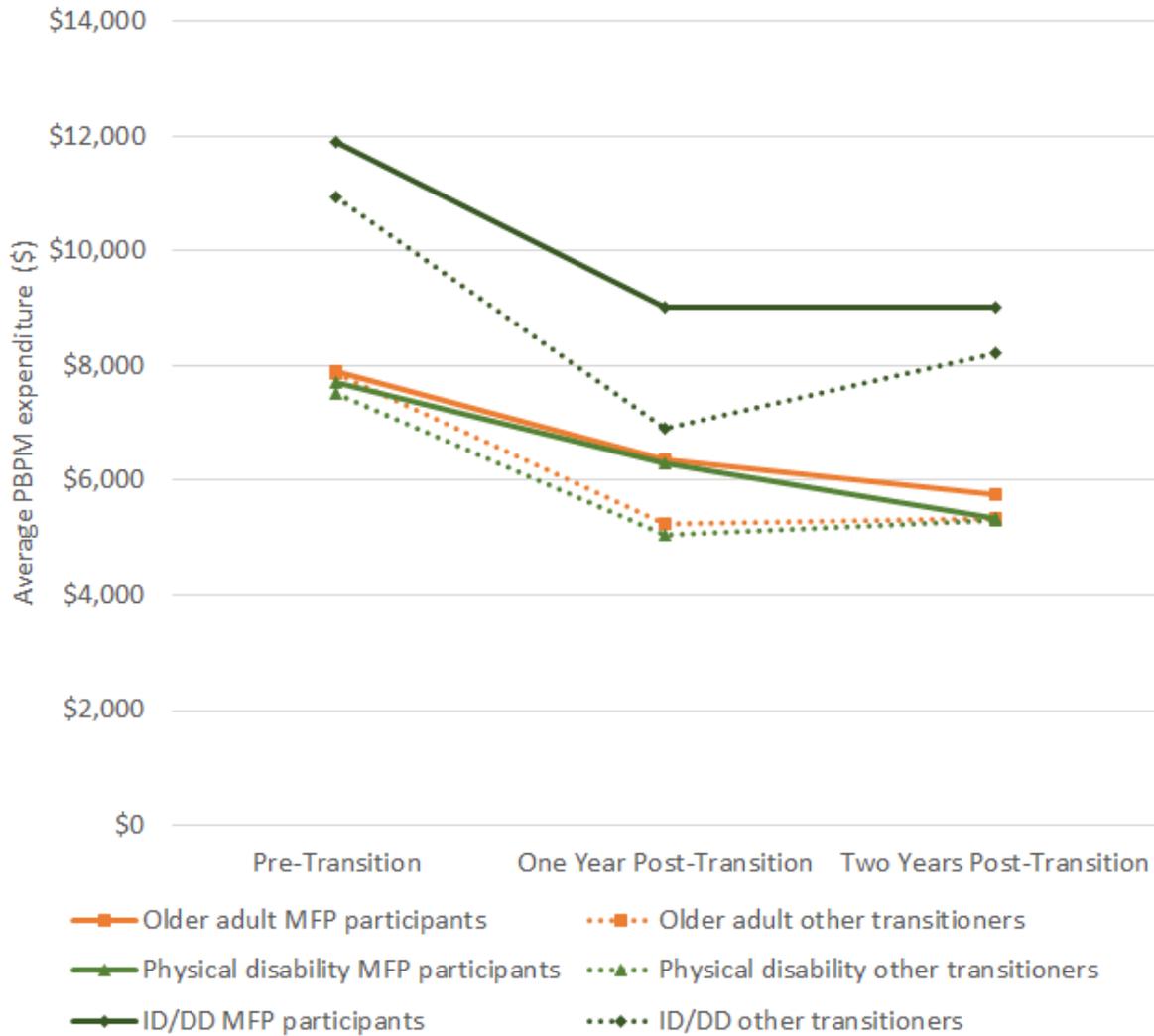
### EXECUTIVE SUMMARY

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In this paper, we evaluate whether the decline in health care costs observed one year after a Money Follows the Person (MFP) demonstration participant transitions to community-based care persists into the second year after leaving the MFP demonstration. Although the legislation that established the MFP demonstration did not set forth cost savings as an explicit goal, it asked the Secretary of Health and Human Services to assess MFP's effectiveness, a term that was not defined in the legislation. One way in which we interpreted effectiveness was the demonstration's ability to affect service costs and utilization post-transition, or its impact on how Medicaid and Medicare costs change after someone transitions to community-based care. In our previous work, we found evidence that total Medicaid and Medicare expenditures decline, sometimes substantially, during the first 12 months after someone transitions from institutional care to community-based care (Irvin et al. 2017).

Overall, the trajectory of MFP participants' post-transition spending differs from the spending trajectory of others who make the same transition without the benefit of the MFP demonstration (known as other transitioners) (see Figure ES.1 for a summary of our findings). In the year after transition, MFP participants had higher health care expenditures than other transitioners, mainly because of greater spending on community-based long-term services and supports (LTSS) afforded by the MFP demonstration. After MFP participants left the demonstration, their expenditures declined because their Medicaid-covered community-based LTSS expenditures declined and more closely approximated those of other transitioners. Part of the reason community-based LTSS expenditures were lower in the second year is that the additional transition services MFP participants received as they left institutional care and set up their homes in the community in the first year were not provided in the subsequent year.

**Figure ES.1. Unadjusted pre- and post-transition monthly health care expenditures for MFP participants and a matched group of other transitioners**



Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional to community-based LTSS from 2010 through 2012 from 32 states.

Note: This figure shows the unadjusted means for total Medicaid and Medicare expenditure categories for the 12 months before and 24 months after transition.

PBPM = per beneficiary per month; ID/DD = intellectual or developmental disabilities.

### **About the Money Follows the Person Demonstration**

The MFP rebalancing demonstration, first authorized by Congress as part of the Deficit Reduction Act of 2005 and extended by the Patient Protection and Affordable Care Act of 2010, is designed to rebalance state Medicaid spending on long-term services and supports from institutional-based settings to community settings. Congress authorized up to \$4 billion in federal funds to support a twofold effort by state Medicaid programs to (1) transition people living in long-term care institutions to homes, apartments, or group homes of four or fewer residents; and (2) change state policies so that Medicaid funds for long-term care services and supports can “follow the person” to the setting of his or her choice. MFP is administered by the Centers for Medicare & Medicaid Services (CMS), which initially awarded MFP grants to 30 states and the District of Columbia in 2007, another 13 states in February 2011, and 3 more states in 2012. CMS contracted with Mathematica Policy Research to conduct a comprehensive evaluation of the MFP demonstration and report the outcomes to Congress.

## **INTRODUCTION**

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The national Money Follows the Person (MFP) rebalancing demonstration helps states rebalance their Medicaid long-term care systems. In a series of annual reports that Mathematica Policy Research produced for the national evaluation of the MFP demonstration funded by the Centers for Medicare and Medicaid Services (CMS) (CMS Contract Number HHSM-500-2010-00026I/HHSM-500-T0010), we have provided basic information about the program, including how it grew and evolved since transitions began in 2008.

In this paper, we evaluate whether the decline in health care costs observed one year after transition persists into the second year after participants have left the MFP demonstration. Studying how health care expenditures change after someone transitions from institutional long-term services and supports (LTSS) to community-based LTSS has been one component of how the national evaluation assessed the effectiveness of the MFP demonstration.<sup>1</sup>

LTSS users are disproportionately costly for Medicaid programs; they account for 6.4 percent of the Medicaid population, but 45.6 percent of Medicaid expenditures (MACPAC 2014). As of fiscal year 2010, Medicaid spent approximately \$35,000 on LTSS (institutional and community services combined) per beneficiary, and another \$7,000 on non-LTSS expenditures. Although the distribution of spending varies by demographics, LTSS expenditures make up a

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<sup>1</sup> Throughout the history of the national evaluation of the MFP demonstration, institutional LTSS has been defined as Medicaid-covered care provided in nursing facilities, intermediate care facilities for individuals with intellectual disabilities, beneficiaries 65 and older residing in an institution for mental diseases, and inpatient psychiatric services for individuals under the age of 21. Similarly, the evaluation has defined community-based LTSS as all services provided through Section 1915(c) waiver programs and state plan services included in the MFP 2015 Annual Report (Irvin et al. 2017) as home- and community-based services, including personal care services, private duty nursing, home health, or hospice care (see Appendix A and Brown et al. [2008] for more details).

greater proportion of spending than non-LTSS spending among beneficiaries who use LTSS (Eiken et al. 2017).

With this historical information in mind, the evaluation of the MFP demonstration has examined how health care expenditures change when participants return to the community. Comparing MFP participants to a matched group of LTSS users who experience the same transition without the supports of the MFP demonstration, we found that MFP is associated with greater total expenditures during the first year after the transition, mainly because of greater community-based LTSS spending (Irvin et al. 2017). One year after transition, MFP participants receive, on average, an additional \$844 (older adults) to \$1,160 (people with intellectual disabilities) in community-based LTSS per month relative to other transitioners. This difference is most likely attributable to the additional demonstration and supplemental services available to MFP participants. Because community-based LTSS are covered only by Medicaid, most of the additional expenditures incurred by MFP participants are for Medicaid-covered services. We also found that Medicare expenditures are statistically significantly greater for MFP participants relative to other transitioners one year after transition. This difference does not drive the overall differences in total expenditures, however, because they represent only a small proportion of total expenditures. We also examined differences in subcategories of non-LTSS (medical) expenditures, including those for inpatient care, skilled nursing facility (SNF) care provided through the Medicare SNF benefit, home health care provided through the Medicare home health benefit, emergency department (ED) services, and physician services. These costs are not as large as those for LTSS expenditures. Post-transition expenditures for physician services and Medicare-covered home health services tend to grow more among MFP participants, but older adult MFP participants experience a larger decline in Medicare-covered SNF expenditures compared to other transitioners after moving to the community.

However, little is known about whether MFP has long-term effects after MFP participants leave the program and stop receiving additional grant-covered services. In particular, we are interested in learning whether the difference in costs observed one year after transition persists two years after transition.

## RESEARCH QUESTIONS

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In this study, we replicate prior work that assessed Medicaid and Medicare expenditures, with a focus on the second year after the transition to community-based LTSS. We define our study periods of interest as follows:

- Pre-transition: baseline period, 1 to 12 months before a person transitions to the community
- One year post-transition: 1 to 12 months after a person transitions to the community
- Two years post-transition: 13 to 24 months after a person transitions to the community

We improve upon earlier analyses of this topic by incorporating the experience of more recent MFP participants and improve the selection of comparison group members, known as other transitioners in this report. The following questions are the focus of this analysis:

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1. How do MFP participants' total health care expenditures (including both community-based and institutional LTSS) change 13 to 24 months after MFP participants transition to the community?
2. Is participation in the MFP demonstration associated with a change in total health care expenditures 13 to 24 months after transitioning?
3. How does the distribution of total health care expenditures (Medicare versus Medicaid, LTSS versus non-LTSS, and categories of non-LTSS expenditures such as inpatient expenditures) change 13 to 24 months after an MFP participant transitions to the community?

Although for this report we focus on health care expenditures during the second year after the transition, we also estimate cost differences one year after transition. Together, the changes in MFP participants' expenditures during both first and second post-transition years provide information on beneficiaries' cost trajectories after transition. These results also shed light on the continuity of MFP's effects—whether significant cost differences in the first year, as reported by previous analyses, still hold in the second year.

## STUDY DESIGN

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The sample of MFP participants used in the following analyses included 19,662 participants who had transitioned any time from January 1, 2010, through December 31, 2012. Appendix A presents details on the data used to select the MFP participants and other transitioners.

As for previous studies, we conducted this refreshed analysis separately for each of the following three targeted populations:

- Beneficiaries age 65 and older who transition from nursing facilities (older adults)
- Beneficiaries under age 65 with physical disabilities who transition from nursing facilities (PD)
- Beneficiaries who transition from intermediate care facilities for individuals with intellectual and developmental disabilities (ID/DD)

We also conducted a subgroup analysis of beneficiaries with mental health conditions; that is, we created a subset of each of the three targeted populations who had a mental health condition reported in their claims records. Mental health conditions were defined using International Classification of Diseases-9 (ICD-9) diagnosis and procedure codes. This definition was based on the Healthcare Effectiveness Data and Information Set approach used in measures to assess the quality of mental health care and does not include substance use disorders.

The key methodological challenge in estimating the effects of MFP participation on health care expenditures is approximating the counterfactual—the outcomes that would have happened in the absence of the MFP demonstration. Thus, we identified a potential group of other transitioners who experienced the same transition from long-term institutional LTSS to community-based LTSS during the same time period but did not participate in the MFP demonstration. From this group of other transitioners, we further selected Medicaid beneficiaries

who matched to the MFP participants in our sample, matching individuals based on demographics, health status, and pre-transition health care utilization and expenditures. Appendix A provides a detailed summary of methods used to construct the matched comparison group, which we refer to as *other transitioners* throughout this report.

### **How do the size and composition of total health care expenditures change when MFP participants transition to the community?**

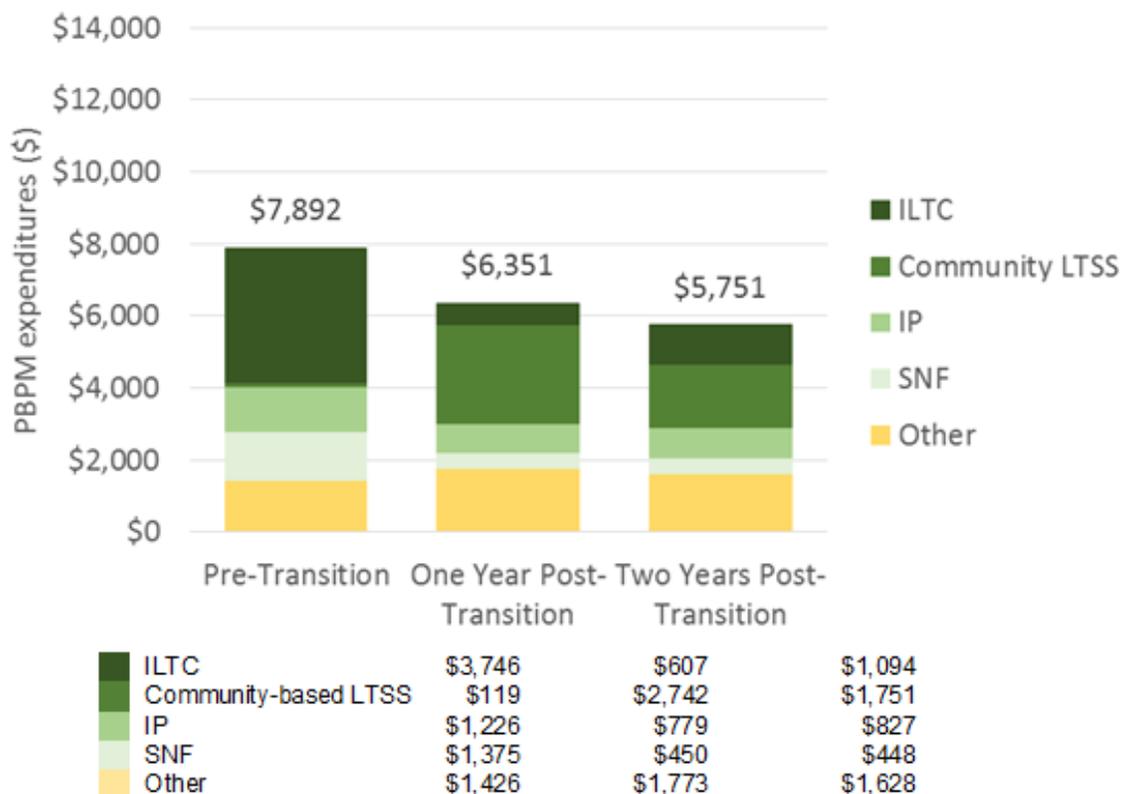
Total health care expenditures for MFP participants, which include both medical care expenditures and expenditures for all forms of LTSS including institutional and community-based services, decline when they transition to the community. Furthermore, total expenditures keep declining after MFP participants leave the demonstration. The decline in total expenditures is largely due to the overall decline in LTSS expenditures.

For older adult MFP participants transitioning from nursing facilities, total monthly expenditures declined 20 percent and 27 percent during the first and second years, respectively, after the transition compared to the year before the transition (Figure 1). There was a similar trend for MFP participants with physical disabilities transitioning from nursing facilities (Figure 2). For MFP participants with intellectual disabilities, total monthly expenditures decreased from \$11,894 to \$9,008 (a 24 percent decline) during the first year (Figure 3), but remained unchanged during the second year. The majority of these changes were due to the overall decline in total LTSS expenditures and changes in the composition of LTSS expenditures, but the overall distribution of expenditures changed in important ways, as well, for the different target populations.

Average LTSS expenditures declined for all MFP target populations but still accounted for the majority of total spending two years after transition. Across all populations studied, the shift from institutional to community-based care appears to have reduced total LTSS spending on a per-beneficiary-per-month basis by \$1,017–\$3,311, from \$3,865–\$11,367 in the year before the transition to \$2,723–\$8,046 two years later. This notable decline in LTSS spending after the transition accounts for the majority of the decline observed in total expenditures. However, we also observed that institutional LTSS spending increased slightly between the first and second post-transition years, most likely due to readmissions to institutional care or the need for institutional-based rehabilitation services.

The changes in non-LTSS spending, however, varied by target population and were not as pronounced as changes in LTSS spending. For all three target populations, non-LTSS spending was relatively steady over time. The category that changed the most was expenditures for Medicare-covered SNF services, which showed continued declines for people transitioning from nursing facilities. No other category consistently decreased for multiple groups across all three periods.

**Figure 1. Distribution of pre- and post-transition monthly health care expenditures for older adult MFP participants transitioning from nursing facilities**

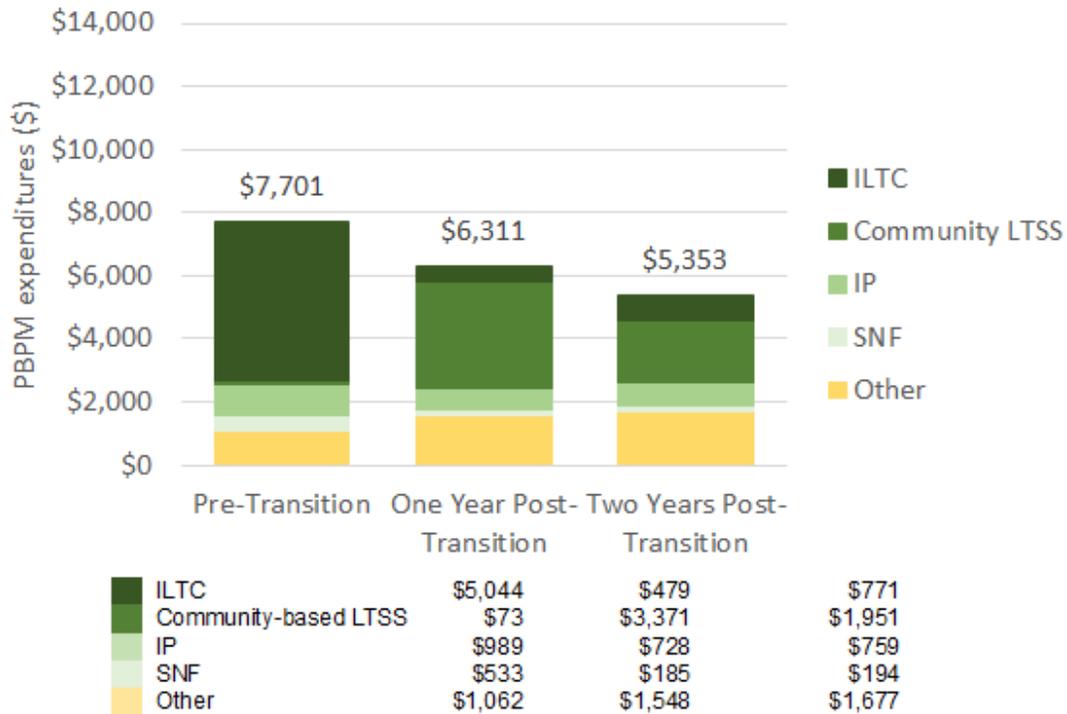


Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 in 32 states.

Note: This analysis is based on an unweighted sample of 1,945 older adult MFP participants who had transitioned by the end of 2012. Monthly expenditures are based on 12 months of pre-transition data and 24 months of post-transition data.

ILTC = institutional long-term care; IP = Medicare- and Medicaid-paid inpatient, short-stay hospitalization; PBPM = per beneficiary per month; Other = all other services, including but not limited to emergency department, physician, hospice, and outpatient radiology services, ambulatory surgery, and durable medical equipment; SNF = Medicare-paid skilled nursing facility.

**Figure 2. Distribution of pre- and post-transition monthly health care expenditures for MFP participants with physical disabilities transitioning from nursing facilities**

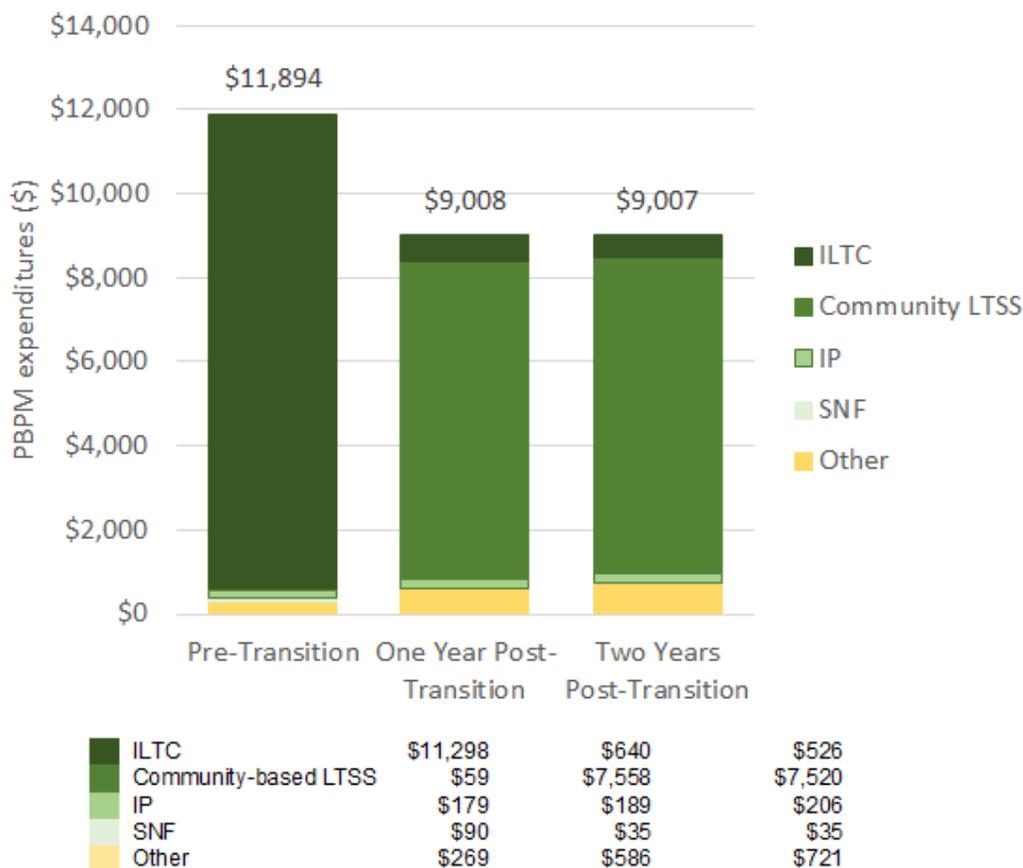


Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 in 32 states.

Note: This analysis is based on an unweighted sample of 3,475 MFP participants with physical disabilities who had transitioned by the end of 2012. Monthly expenditures are based on 12 months of pre-transition data and 24 months of post-transition data.

ILTC = institutional long-term care; IP = Medicare- and Medicaid-paid inpatient, short-stay hospitalization; PBPM = per beneficiary per month; Other = all other services, including but not limited to emergency department, physician, hospice, and outpatient radiology services, ambulatory surgery, and durable medical equipment; SNF = Medicare-paid skilled nursing facility.

**Figure 3. Distribution of pre- and post-transition monthly health care expenditures for MFP participants transitioning from intermediate care facilities for individuals with intellectual disabilities**



Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 in 32 states.

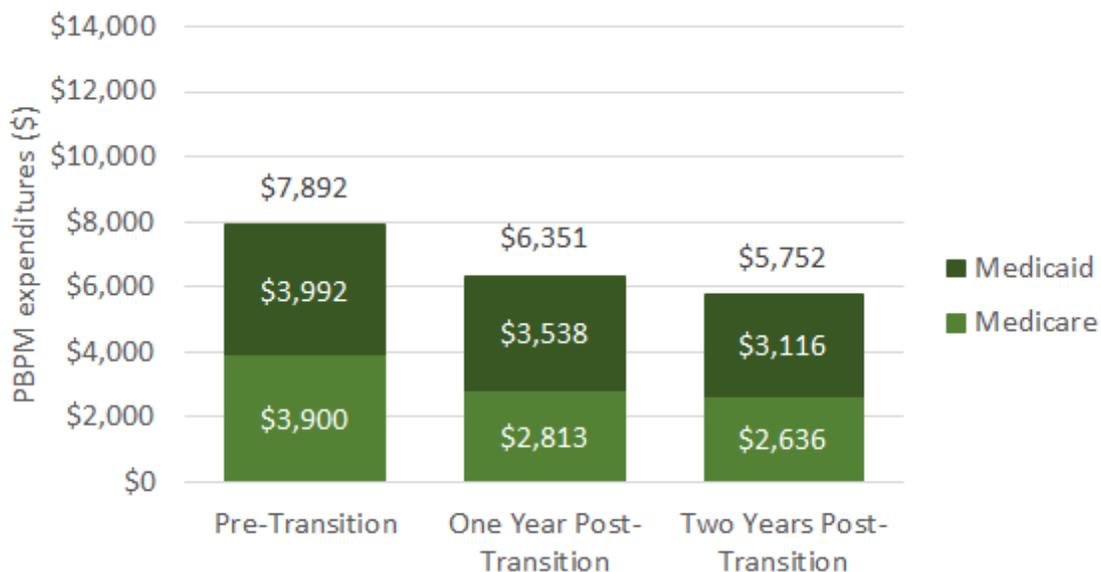
Note: This analysis is based on an unweighted sample of 2,110 MFP participants with intellectual disabilities who had transitioned by the end of 2012. Monthly expenditures are based on 12 months of pre-transition data and 24 months of post-transition data.

ILTC = institutional long-term care; IP = Medicare- and Medicaid-paid inpatient, short-stay hospitalization; PBPM = per beneficiary per month; Other = all other services, including but not limited to emergency department, physician, hospice, and outpatient radiology services, ambulatory surgery, and durable medical equipment; SNF = Medicare-paid skilled nursing facility.

Changes in Medicare and Medicaid spending are difficult to interpret because of changing eligibility. A small proportion of MFP participants gained Medicare eligibility after they transitioned to the community. Overall, both Medicaid and Medicare expenditures decreased from the year before the transition to the year after the transition and again two years after the transition for older participants leaving nursing facilities (Figure 4). For participants with physical disabilities, there was a substantial decrease in Medicaid expenditures (\$5,592 pre-transition, \$4,332 one year after transition, and \$3,346 two years after transition) while Medicare expenditures remained steady (Figure 5). For MFP participants with intellectual disabilities,

Medicaid expenditures decreased from the year before the transition to the year after the transition, but remained unchanged during the second year after transition (Figure 6).

**Figure 4. Distribution of Medicare and Medicaid pre- and post-transition monthly expenditures for older adult MFP participants transitioning from nursing facilities**

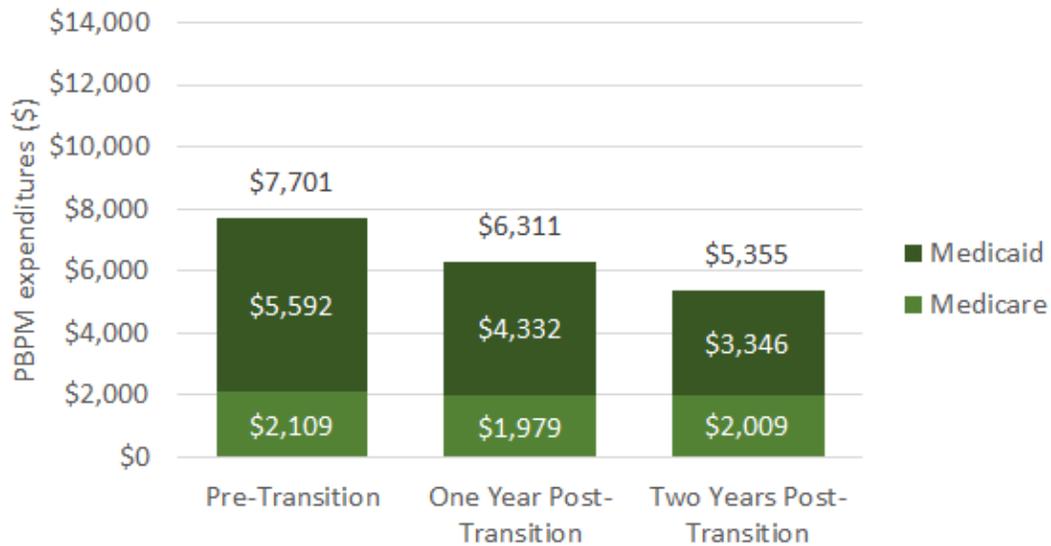


Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 in 32 states.

Note: This analysis is based on an unweighted sample of 1,945 older adult MFP participants who had transitioned by the end of 2012. Monthly expenditures are based on 12 months of pre-transition data and 24 months of post-transition data.

PBPM = per beneficiary per month.

**Figure 5. Distribution of Medicare and Medicaid pre- and post-transition monthly expenditures for MFP participants with physical disabilities transitioning from nursing facilities**

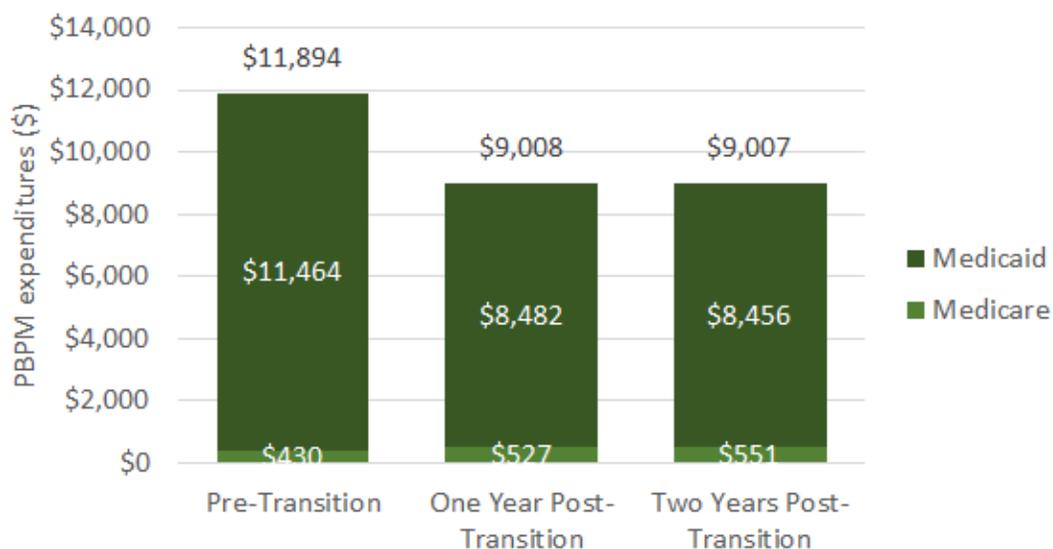


Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 in 32 states.

Note: This analysis is based on an unweighted sample of 3,475 older adult MFP participants who had transitioned by the end of 2012, regardless of their inclusion in the analyses presented in the following sections. Monthly expenditures are based on 12 months of pre-transition data and 24 months of post-transition data.

PBPM = per beneficiary per month.

**Figure 6. Distribution of Medicare and Medicaid pre- and post-transition monthly expenditures for MFP participants transitioning from intermediate care facilities for individuals with intellectual disabilities**



Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 in 32 states.

Note: This analysis is based on an unweighted sample of 2,110 older adult MFP participants who had transitioned by the end of 2012, regardless of their inclusion in the analyses presented in the following sections. Monthly expenditures are based on 12 months of pre-transition data and 24 months of post-transition data.

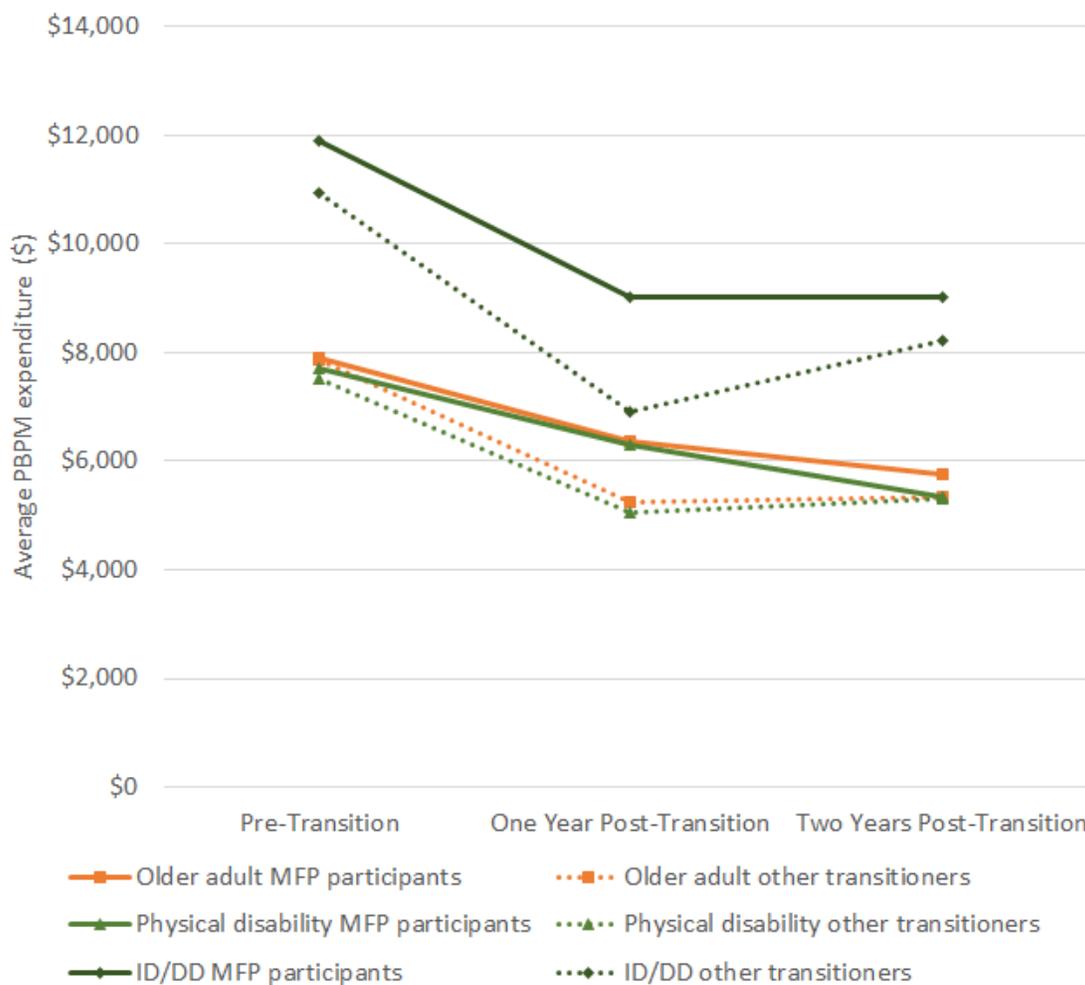
PBPM = per beneficiary per month.

### How do post-transition total health care expenditures of MFP participants differ from those of other transitioners?

Post-transition, total health care expenditures for MFP participants were higher than those of other transitioners, but the difference was much smaller during the second year after the transition as the expenditures for both groups converged (Figure 7). (This section discusses unadjusted expenditure patterns, and the following section discusses expenditure patterns after we adjusted for observable differences between MFP participants and other transitioners such as age, gender, and presence of chronic conditions.) For the nursing home population (both older and younger adults), these differences were driven primarily by LTSS expenditures. MFP participants had considerably greater LTSS expenditures during the first year after the transition because they received more community-based LTSS, which was by design. During the second year, total monthly expenditures for MFP participants were only marginally greater than those of the matched other transitioners. This increase is expected because MFP participants were no longer utilizing the additional services offered by MFP, many of which focused on supporting the transition to community living. The same pattern holds for people with intellectual disabilities: MFP participants had significantly higher total monthly expenditures during the first year after the transition and slightly higher total monthly expenditures during the second year. However, in this target population, MFP participants had higher institutional LTSS expenditures in both years after transition, which suggests that they were more likely to be reinstitutionalized.

In this analysis, post-transition institutional expenditures include all types of admissions to institutional care, regardless of the length of stay.<sup>2</sup> The data indicate (although we do not present it here) that, despite returning to institutional care, beneficiaries typically returned to the community after a subsequent institutional stay.

**Figure 7. Unadjusted pre- and post-transition monthly health care expenditures for MFP participants and a matched group of other transitioners**



Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 from 32 states.

Note: This figure shows the unadjusted means for total Medicaid and Medicare expenditures for the 12 months before and 24 months after transition.

LTSS = long-term services and supports; PBPM = per beneficiary per month; ID/DD = intellectual or developmental disabilities.

<sup>2</sup> Post-transition institutional expenditures capture stays of any length and are not restricted only to stays that are 30 days or longer.

## Are the differences between MFP participants and other transitioners associated with the MFP demonstration?

It appears that the differences between MFP participants and other transitioners are associated with being in the MFP demonstration. When we adjust the data to control for demographics and pre-transition characteristics, the results indicate that MFP participants' post-transition health care expenditures (in the first and second years after the transition) were greater than those of other transitioners (Tables 1 and 2). Average total health care expenditures declined for all persons who transitioned, but MFP participants' expenditures did not decline to the same extent as those of other transitioners during the first year post-transition. From the first to second year, average total expenditures declined for MFP transitioners and increased slightly for other transitioners. For older adults transitioning from nursing facilities, total monthly expenditures declined by \$2,635 for other transitioners, but declined by \$1,541 for MFP participants during the first year. During the second year, among older adults the expenditures of MFP participants declined an additional \$602 per beneficiary per month, whereas total expenditures for other transitioners in this group increased by \$102 per beneficiary per month. Similarly for the other target populations, total expenditures declined during the first year for both MFP participants and other transitioners, and expenditures for MFP participants only continued to decline in the second year (Figure 8).

**Table 1. Change in per-beneficiary-per-month health care expenditures for MFP participants relative to a matched comparison group of other transitioners from pre-transition to first year post-transition (in dollars)**

Expenditure category	Older adults		Persons with physical disabilities		Persons with intellectual and developmental disabilities	
	MFP	Other transitioners	MFP	Other transitioners	MFP	Other transitioners
Total	-1,541***	-2,635	-1,391***	-2,462	-2,885***	-4,031
Medicaid	-455***	-1,629	-1,260***	-2,215	-2,982***	-4,017
Medicare	-1,086	-1,006	-131	-247	97*	-13
Total LTSS	-516***	-1,727	-1,267***	-2,473	-3,158***	-4,227
Community-based LTSS	2,624***	1,333	3,298***	1,814	7,499***	5,257
Institutional LTSS	-3,139	-3,061	-4,565***	-4,287	-10,658***	-9,484
Total medical	-1,025	-908	-123	11	273	197
Inpatient	-447	-450	-261	-315	11	-5
SNF	-925***	-674	-349	-347	-55	-28
Home health	477***	374	235***	196	37*	27
ED	8***	1	9**	4	7	8
Physician	33*	30	27*	24	22*	20

Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 from 32 states.

Note: The matched sample of other transitions is based on a propensity score-matching approach described in more detail in Appendix A. The results show the change in monthly expenditures post-transition. We tested

whether these changes differ between the MFP and other transitioner groups. Both the SNF and home health expenditures only represent what was paid for by the Medicare program. Medicaid-covered home health is subsumed in community-based LTSS expenditures.

\*  $p < 0.05$ ; \*\*  $p < 0.001$ ; \*\*\*  $p < 0.0001$ .

ED = emergency department; ID/DD = intellectual or developmental disabilities; LTSS = long-term services and supports; SNF = Medicare-covered skilled nursing facility care.

**Table 2. Change in per-beneficiary-per-month health care expenditures for MFP participants relative to a matched comparison group of other transitioners from first year post-transition to second year post-transition (in dollars)**

Expenditure category	Older adults		Persons with physical disabilities		Persons with intellectual and developmental disabilities	
	MFP	Other transitioners	MFP	Other transitioners	MFP	Other transitioners
Total	-602***	102	-958***	246	-1***	1,322
Medicaid	-422***	514	-986***	249	-26***	1,372
Medicare	-177*	-411	30	-2	25	-50
Total LTSS	-504***	536	-1,127***	430	-152***	1,358
Community-based LTSS	-991***	-158	-1,420***	-55	-38***	1,207
Institutional LTSS	487**	694	293*	485	-114	151
Total medical	-98*	-434	170**	-184	151*	-36
Inpatient	48*	-121	32**	-16	17*	-55
SNF	-1*	-113	10	24	0**	-52
Home health	-257*	-224	-86	-99	-4	-12
ED	-3*	0	1*	-3	-1	-2
Physician	-11	-10	1	-1	1	0

Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 from 32 states.

Note: The matched sample of other transitions is based on a propensity score-matching approach described in more detail in Appendix A. The results show the change in monthly expenditures post-transition. We tested whether these changes differ between the MFP and other transitioner groups. Both the SNF and home health expenditures only represent what was paid for by the Medicare program. Medicaid-covered home health is subsumed in community-based LTSS expenditures.

\*  $p < 0.05$ ; \*\*  $p < 0.001$ ; \*\*\*  $p < 0.0001$ .

ED = emergency department; ID/DD = intellectual or developmental disabilities; LTSS = long-term services and supports; SNF = Medicare-covered skilled nursing facility care.

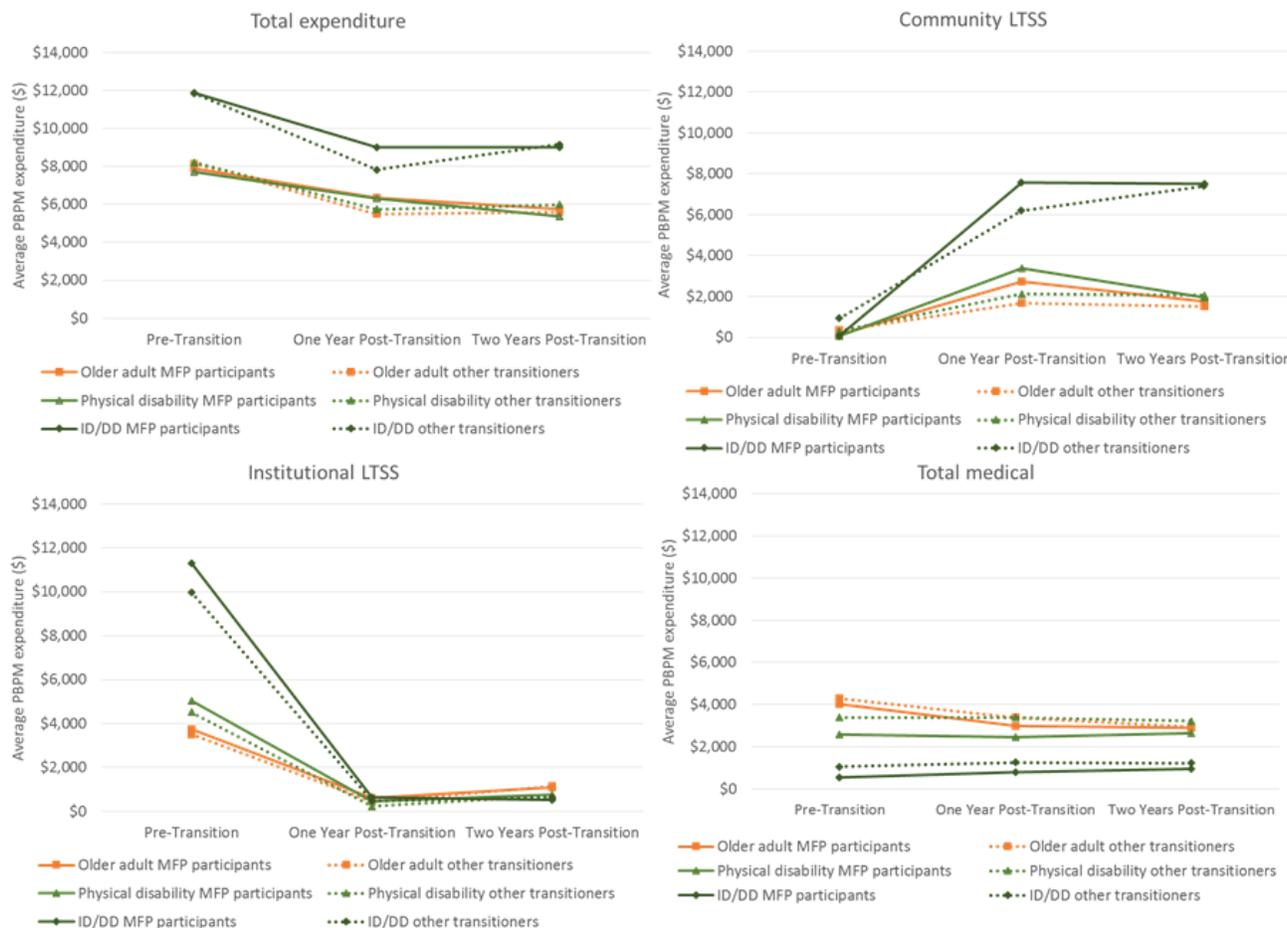
The greater total spending for MFP participants during the first year was due almost entirely to significantly greater post-transition spending on community-based LTSS (Table 1). MFP participants received an additional \$1,291 (older adults) to \$2,242 (individuals with intellectual disabilities) in community-based LTSS per month relative to other transitioners. This difference is most likely attributable to the additional demonstration and supplemental services available to MFP participants. However, among all groups, assessed expenditures for community-based

LTSS declined from the first to the second year (Table 2), except for other transitioners with intellectual disabilities. The declines were sharper and steeper for MFP participants compared to other transitioners. However, MFP participants continued to have slightly higher expenditures for community-based LTSS in the second year compared to other transitioners, except among younger adults with physical disabilities. Young adult MFP participants with physical disabilities had slightly lower community-based LTSS expenditures in the second year compared to other transitioners (Figure 8).

Most of the additional expenditures incurred were for Medicaid-covered services. Thus, Medicaid expenditures were statistically significantly greater for MFP participants relative to other transitioners during the first year. Similarly, Medicaid expenditures continued to decrease during the second year post-transition for MFP participants, but not for other transitioners. Differences in medical subcategories of health care expenditures were not as pronounced as those for LTSS expenditures (Tables 1 and 2).

Overall, the trajectory of MFP participants' post-transition spending differs from the spending trajectory of other transitioners. Figure 8 depicts the regression-adjusted spending patterns of total expenditures, community-based LTSS, institutional LTSS, and total medical (non-LTSS) expenditures of MFP participants and other transitioners. In the year after transition, MFP participants' total expenditures were greater than those of other transitioners, mainly because of greater community-based LTSS spending afforded by the MFP demonstration. During this same period, institutional LTSS spending and non-LTSS spending were similar or lower for MFP participants. After the additional services offered through MFP were no longer available, MFP participants' community-based LTSS expenditures declined, but not to the level of other transitioners. At the same time, MFP participants' medical expenditures remained similar while institutional LTSS spending remained lower compared to other transitioners. The services MFP participants receive seem to have a lasting effect beyond the first year after the initial transition.

**Figure 8. Regression-adjusted per-beneficiary-per-month (PBPM) health care expenditures between MFP participants and other transitioners**



Source: Mathematica’s analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 from 32 states.

Note: This figure shows the regression-adjusted means for expenditure categories for the 12 months before and 24 months after transition.

LTSS = long-term services and supports; ID/DD = intellectual or developmental disabilities.

**Do results differ if the beneficiary has a mental health condition?**

A large proportion of MFP participants have a mental or behavioral health condition—between 45 and 72 percent, depending on the target population—and there is policy interest in how MFP participants with mental health conditions fare. In the analyses presented above, we controlled for mental health conditions as part of our process for matching other transitioners to MFP participants. In addition, we controlled for the presence of a mental health condition when estimating the difference in post-transition outcomes between MFP participants and other transitioners. We also re-ran our analyses for MFP participants and other transitioners with mental illness only and no co-occurring disabilities.

The presence of a mental health condition does not appear to change the overall effect of MFP on health care expenditures in either the first or second years post-transition. That is, average total health care expenditures declined for all persons who transitioned, but total expenditures for MFP participants with mental health conditions declined to a lesser extent in the first year than those of other transitioners with mental health conditions (see Tables B.3 and B.4 for more details). There are lasting effects for MFP participants with mental illness conditions beyond the first year post-transition as their total expenditures continued to decline in the second year after transition, whereas the expenditures for other transitioners increased slightly in the second year after transition. Results for the subgroup analyses for those with mental illness are available in Appendix B.

## DISCUSSION

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On average, when Medicaid beneficiaries transition from a long institutional stay to community-based LTSS, their total Medicaid and Medicare expenditures decline. This decline in expenditures occurs whether or not the beneficiary participates in the MFP demonstration, as reflected by the comparison between MFP participants and other beneficiaries who experience the same transition without the benefits of the MFP demonstration. These other transitioners provide a counterfactual for what would have happened had the MFP demonstration not been implemented. Being in the MFP demonstration is associated with higher post-transition expenditures. Relative to other transitioners, MFP participants had higher post-transition total expenditures, mainly because of greater expenditures for community-based LTSS, which is by design. In the second year after transitioning, expenditures continued to decline for MFP participants while those of other transitioners increased. Although total expenditures for MFP participants and other transitioners started to converge during the second year, the expenditures of MFP participants still remained higher than those of other transitioners. Regardless, there appear to be lingering long-term effects on health care costs of participants after they leave the MFP demonstration.

In general, these findings aligned with our expectations. MFP participants gained access to additional services, which led to greater spending relative to other transitioners during the first year post-transition. When these additional services ended and MFP participants were only receiving services through a 1915(c) waiver or through the state plan (such as state plan personal care services), their LTSS expenditures continued to decline in the second year. Expenditures for medical care services such as inpatient stays, ED visits, and physician services do not indicate that the shifting patterns in expenditures for LTSS had notable effects on beneficiaries and their need for medical care. However, this analysis does not allow us to assess whether the level of community-based LTSS was sufficient or deficient in meeting beneficiaries' needs.

Many factors complicate how we interpret these findings. First, lower or declining expenditures are not always desirable, especially if they represent an increase in unmet need. In the case of MFP, declines in spending on community-based LTSS were by design and do not seem to have come at the detriment of increased medical spending or institutionalization. Second, changes in expenditures are also due to changes in utilization. During the second year post-transition, MFP participants used LTSS at similar rates as other transitioners, with the exception of persons with physical disabilities, who were significantly less likely to use

community-based LTSS (data not shown) than other transitioners. It is unclear why persons with physical disabilities had a different post-transition expenditure pattern relative to other targeted populations; we hypothesize that younger beneficiaries with physical disabilities might need only short-term support on average in the form of assistive technology or transition support services, but this hypothesis requires further study. Lastly, it is likely that some unobserved characteristics influence the likelihood that beneficiaries transition through MFP or influence the post-transition costs of participants. These unmeasured confounding factors might explain some of the differences in health care expenditures between MFP participants and other transitioners.

## **ACKNOWLEDGEMENTS**

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This research was conducted by Mathematica Policy Research under contract with the Centers for Medicare & Medicaid Services (HHSM-500-2010-00026I/HHSM-500-T0010). The authors extend thanks to Jonathan Gellar for his technical help and Emily Newton for her continued support. Effie George, Jean Close, and Melissa Harris provided invaluable feedback on an early draft and greatly improved this report. We also wish to thank all the state personnel who compiled and submitted the data we used for this report.

## REFERENCES

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- Bohl, Alex, John Schurrer, Dean Miller, Wilfredo Lim, and Carol V. Irvin. “The Changing Medical and Long-Term Care Expenditures of People Who Transition from Institutional Care to Home- and Community-Based Services.” National evaluation of the Money Follows the Person (MFP) Demonstration Grant Program, reports from the field #15. Cambridge, MA: Mathematica Policy Research, October 2014.
- Brown, Randall, Carol V. Irvin, Debra Lipson, Sam Simon, and Audra Wenzlow. “Research Design Report for the Evaluation of the Money Follows the Person (MFP) Grant Program.” Final report submitted to the Centers for Medicare & Medicaid Services, division of Advocacy and Special Initiatives, Disabled and Elderly Health Programs Group. Cambridge, MA: Mathematica Policy Research, October 2008.
- Eiken, Steve, Kate Sredl, Brian Burwell, and Rebecca Woodward. “Medicaid Expenditures for Long-Term Services and Supports (LTSS) in FY 2015.” Cambridge, MA: Truven Health Analytics, April 2016.
- Irvin, Carol V., Noelle Denny-Brown, Alex Bohl, Andrea Wysocki, Kate Stewart, Rebecca Coughlin, Susan R. Williams, Jason Smoot, Allison Steiner, and Victoria Peebles. “Money Follows the Person 2015 Annual Evaluation Report.” Final report submitted to the Centers for Medicare & Medicaid Services, Division of Community Services Transformation, Disabled and Elderly Health Programs Group. Cambridge, MA: Mathematica Policy Research, May 2017.
- Hansen, Ben B., and Stephanie O. Klopfer. “Optimal Full Matching and Related Designs via Network Flows”. *Journal of Computational and Graphical Statistics*, vol. 15, no. 3, 2006, pp. 609–627. <https://doi.org/10.1198/106186006x137047>.
- Kronick, Richard, Todd Gilmer, Tony Dreyfus, and Lora Lee. “Improving Health-Based Payment for Medicaid Beneficiaries: CDPS.” *Health Care Financing Review*, vol. 21, no. 3, Spring 2000, pp. 29–64. Available at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/HealthCareFinancingReview/>. Accessed December 10, 2017.
- Medicaid and CHIP Payment Advisory Council (MACPAC). “Medicaid’s Role in Providing Assistance with Long-Term Services and Supports.” In *Report to Congress on Medicaid and CHIP*. Washington, DC: MACPAC, June 2014. Available at [https://www.macpac.gov/wp-content/uploads/2015/01/Medicoids\\_Role\\_in\\_Providing\\_Assistance\\_with\\_Long-Term\\_Services\\_and\\_Supports.pdf](https://www.macpac.gov/wp-content/uploads/2015/01/Medicoids_Role_in_Providing_Assistance_with_Long-Term_Services_and_Supports.pdf). Accessed December 10, 2017.
- Rosenbaum, Paul R., and Donald B. Rubin. “The Central Role of the Propensity Score in Observational Studies for Causal Effects.” *Biometrika*, vol. 70, no. 1, April 1983, pp. 41–55. <https://doi.org/10.2307/2335942>.
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- Rosenbaum, Paul R., and Donald B. Rubin. “Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score.” *The American Statistician*, vol. 39, no. 1, 1985, pp. 33–38. <https://doi.org/10.1080/00031305.1985.10479383>.
- Ross, Jessica, Sam Simon, Carol V. Irvin, and Dean Miller. “Institutional Level of Care Among Money Follows the Person Participants.” National evaluation of the Money Follows the Person (MFP) Demonstration Grant Program, reports from the field #10. Cambridge, MA: Mathematica Policy Research, October 2012.
- Rubin, Donald B. “Using Propensity Scores to Help Design Observational Studies: Application to the Tobacco Litigation”. *Health Services and Outcomes Research Methodology*, vol. 2, no. 3, December 2000, pp.169–188. <https://doi.org/10.1023/A:1020363010465>.
- Rubin, Donald B., and Thomas, N. “Combining Propensity Score Matching with Additional Adjustments for Prognostic Covariates.” *Journal of the American Statistical Association*, vol. 95, no. 450, 2000, pp. 573–585. <https://doi.org/10.1080/01621459.2000.10474233>.
- Stuart, Elizabeth A. “Matching Methods for Causal Inference: A Review and Look Forward.” *Statistical Science*, vol. 21, no. 1, 2010, pp. 1–25. <https://doi.org/10.1214/09-sts313>.

## **APPENDIX A: DATA AND METHODS**

**Data.** Analyses on health care expenditures during the second year post-transition were conducted using Medicare and Medicaid claims and enrollment files, Nursing Facility Minimum Data Set (NF-MDS) assessment data, and Money Follows the Person (MFP) services files. With these files, we were able to identify Medicaid beneficiaries who transitioned from institutional care to community-based long-term services and supports (LTSS) at any point from 2010 to 2012, beneficiaries who enrolled in the MFP demonstration, expenditures during the 12 months before and 24 months after the transition, and person-level characteristics. We included Medicare claims from the following sources: Medicare Provider Analysis and Review; Carrier, Home Health, Outpatient, Home Health Agency, and Durable Medical Equipment files; Medicaid claims from the Medicaid Analytic eXtract (MAX) Other (which includes claims for outpatient, laboratory, home health, and premium payments), Long-Term Care, and Inpatient files; and claims for MFP-paid community-based LTSS from the MFP services file. We obtained enrollment and demographic information from the Medicare Master Beneficiary Summary File, the MAX Person Summary file, and the MFP Program Participation file.

**Identifying MFP participants and other transitioners.** We identified MFP participants by using the MFP national evaluation enrollment records from 32 state<sup>3</sup> grantees who actively transitioned Medicaid beneficiaries at any point in 2010 through 2012. The comparison group included Medicaid beneficiaries who transitioned from institutional care to community-based LTSS outside of the MFP demonstration during the same period.

A transition from institutional long-term care was identified if at least 91 days of care were observed in an MFP-eligible institution (that is, nursing facility, intermediate care facility for individuals with intellectual disabilities, and institutions for mental diseases) and home- and community-based services (HCBS) use occurred within three months of discharge.<sup>4</sup> To identify HCBS users, we used both indicators of enrollment in 1915(c) waivers from the MAX Person Summary file and receipt of HCBS under either a 1915(c) waiver or through the state plan from the MAX Other files.<sup>5</sup> Use of HCBS under a 1915(c) waiver was defined as at least one month of claims for personal care, at-home private duty nursing, adult day, home health of at least 90 days, residential care, at-home hospice, rehabilitation, case management, transportation, or durable medical equipment. Use of HCBS via the state plan was defined as at least one month of claims for personal care, at-home private duty nursing, adult day, home health of at least 90 days, residential care, or at-home hospice. The restriction requiring at least three consecutive months

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<sup>3</sup> The 32 grantee states include Arkansas, California, Connecticut, Delaware, District of Columbia, Georgia, Iowa, Illinois, Indiana, Kentucky, Louisiana, Massachusetts, Maryland, Michigan, Missouri, Mississippi, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Tennessee, Vermont, Virginia, Washington, and Wisconsin.

<sup>4</sup> On March 23, 2010, as part of the Affordable Care Act, the criterion for MFP participation was reduced from a minimum of 180 days of institutional care to 90 days, not counting Medicare rehabilitation days. We applied this change as of April 1, 2010, for ease of data processing.

<sup>5</sup> Enrollment in a 1915(c) waiver was defined as at least one month of enrollment in the following waivers: aged/disabled, aged only, disabled only, traumatic brain injury, HIV/AIDS, mentally retarded/developmentally disabled, mental illness, technologically dependent, an unspecified waiver, or autism. We also included the autism waivers in the standard definition of an HCBS user; however, use of the autism waiver is generally restricted to children, who are not eligible for the measure denominators.

(90 days) of home health use is designed to eliminate those whose home health care is for rehabilitation purposes only.

To construct the appropriate sample of MFP transitioners, we used data from the MFP administrative data to identify MFP participants. To be included, MFP participants had to have a valid transition date and be matched to the MAX Person Summary file. Additional exclusions for both MFP and other transitioners included hospice use in the months surrounding the transition, use of HCBS in the three months before transition, unavailability of data, or death within two years after transition.

**Target populations.** We stratified our analysis based on the populations the MFP demonstration targeted. To do this step, we relied on a Medicaid beneficiary's age and the institution from which he or she transitioned. We divided transitioners into three target populations: (1) adults 65 and older who transitioned from nursing facilities, (2) people with physical disabilities younger than 65 who transitioned from nursing facilities, and (3) people with intellectual disabilities who transitioned from intermediate care facilities for individuals with intellectual disabilities. Similar to previous reports, as part of a subgroup analysis, we further identified beneficiaries with mental health conditions. People with mental health conditions include those who had a claim with relevant diagnostic, procedure, revenue center, or provider codes for a mental health condition during the 12 months before the transition.<sup>6</sup>

**Exclusions.** We excluded people who (1) were enrolled in Medicare or Medicaid managed care; (2) had no record of receiving community-based LTSS after the transition, including MFP participants who had no claim for an MFP-covered community-based LTSS; (3) received Medicare- or Medicaid-paid hospice services prior to transition; (4) had Medicaid-paid hospice services in the month of transition or in either of the next two calendar months; (5) died within 24 months after transition; or (6) had more than a one-month gap in Medicaid enrollment in the 12 months before or 24 months after transition.

**Measures of expenditures.** This analysis takes the perspective of the Medicaid and Medicare programs. There are three expenditure categories of interest: (1) total overall expenditures, (2) LTSS, and (3) medical care expenditures. We further divided LTSS into community- or institutional-based LTSS. We categorized medical expenditures as inpatient (acute hospital) care, Medicare-paid skilled nursing facility (SNF) care, Medicare-paid home health, physician office visits, and emergency department (ED) visits.

Total expenditures included all Medicaid-paid services and Medicare-paid Part A and Part B services (for those dually eligible for Medicare and Medicaid). Medicaid- or Medicare-paid

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<sup>6</sup> For outpatient claims records, we only flagged people as having a mental health condition if they had at least two outpatient claims records for services on two different days that included a diagnosis for a mental health condition. For inpatient claims records, we required only one claim to have a diagnosis for a mental health condition. Mental health conditions included schizophrenic disorders; episodic mood disorders; delusional disorders; other nonorganic psychoses; pervasive developmental disorders; obsessive-compulsive disorders; dysthymic disorders; personality disorders; acute reaction to stress; adjustment reaction; depressive disorder, not elsewhere classified; disturbance of conduct, not elsewhere classified; disturbance of emotions specific to childhood and adolescence; and hyperkinetic syndrome of childhood.

prescription drugs were excluded. LTSS expenditures consisted of all Medicaid payments for community- and institutional-based LTSS. Medical care expenditures included all Medicaid payments not otherwise classified as LTSS expenditures, plus all Medicare expenditures. We used both Medicare and Medicaid payments to capture inpatient, physician office, ED, and hospice expenditures, but used only Medicare claims to measure SNF and home health expenditures. We included all medical services not categorized into these categories (such as ambulatory surgery) when calculating total expenditures and medical expenditures, but they are not in any specific category.

We defined expenditures using the “amount paid” field on Medicare and Medicaid claims, with one exception: we summed the Medicare payment amount and the pass-through amount for inpatient and SNF claims. Based on the year of transition, we inflated all expenditures by the annual medical care consumer price index to represent 2015 dollars. We did not consider housing grants, out-of-pocket expenditures, or any administrative expenses. Because we identified transitions from 2010 through 2012, the pre- and post-transition expenditures might reach into 2009 or 2014, respectively.

**Measures of utilization.** The utilization variables capture ED visits, inpatient stays, physician visits, institutional long-term care, and home health or rehabilitation care after an inpatient stay. We used these utilization variables to better match other transitioners to MFP transitioners. See Irvin et al. (2017) for a more detailed description of how we constructed utilization measures.

**Comparison group selection.** The key methodological challenge in estimating the effects of MFP participation on expenditures is approximating the counterfactual—the outcomes that would have happened in the absence of MFP. Those who transition outside of the MFP demonstration are a non-random, select group of transitioners who might differ in important ways from MFP participants.

To find a group of transitioners who resemble the sample of MFP participants, we used a matching procedure commonly referred to as *propensity score matching* (Rosenbaum and Rubin 1983). Matching allows for an approximation of an experimental design by assuming that the decision to participate is random, conditional on a set of observable characteristics. The propensity score is estimated from a hierarchical logistic regression model fitted to our analytic sample that includes both MFP participants and other transitioners. The dependent variable is MFP participation, and the independent variables include factors hypothesized to be related to participation in the MFP demonstration. Because MFP is a state-run program and program characteristics differ across states, we conducted the matching separately within each state (exact matching by state). Table A.1 lists all matching variables and their levels of control.

We modified our matching procedure and implemented the Mahalanobis distance with propensity score distance (Rubin and Thomas 2000; Stuart 2010) to minimize unobserved differences between MFP and comparison groups. The propensity score distance summarizes differences among all variables included in the propensity score model. The Mahalanobis distance on medical and LTSS expenditures measures differences on these two categories of expenditures, which had been shown to be difficult to match due to large differences in the pre-

transition period seen in previous analyses. By combining propensity score distance and Mahalanobis distance, we were able to achieve good balance on all variables. The strongest focus was on achieving balance on certain key covariates, namely medical and LTSS expenditures in the pre-transition period.

We summarize our procedure for selecting individuals into the counterfactual, or comparison group, in three steps:

1. **Estimate the propensity score.** We used hierarchical logistic regression to model the probability of transitioning from an institution to the community by enrolling in the MFP demonstration. We fitted separate models for each target population, but combined all states in a single model to “borrow strength” across states in estimating the relationship between each covariate and MFP participation. We included a random intercept for each state to compare for unobserved state-specific factors affecting MFP participation rates. For the analysis of those people with mental health conditions, we repeated the estimation but restricted it to those identified as having a mental health condition before their transition to the community.
2. **Calculate distances.** The Mahalanobis distance was based on pre-transition medical expenditures and pre-transition LTSS expenditures. For each MFP participant, we calculated the Mahalanobis distance for each potential comparison. Potential comparisons are other transitioners from the same state and target population. Our final distance was the sum of propensity score distance and Mahalanobis distance.
3. **Select optimal comparisons for each participant.** We implemented optimal matching using the “optmatch” package in R.<sup>7</sup> Specifically, we matched with replacement, whereby each potential comparison transitioner can be matched to more than one MFP participant. Optimal matching minimizes a global distance criterion instead of many local criteria, as used by nearest neighbor matching. If a potential comparison transitioner was selected more than once, that person received an additional weight in the final matched analysis.

We conducted the matching procedure twice: once for the entire target population, and again for the subgroup of individuals with mental health conditions.

**Table A.1. Independent variables included in the propensity score estimation and their levels of control**

All targeted populations		Mental illness subgroup	
Variable	Level of control	Included	Level of control
State	Exact match	X	Exact match <sup>8</sup>
Age older than 65	Propensity score	X	Propensity score
Gender	Propensity score	X	Propensity score

<sup>7</sup> Available on the Comprehensive R Archive Network (CRAN). The *fullmatch* function within this package creates optimal full matches for the specified treatment group (Hansen and Klopfer 2006).

<sup>8</sup> We did not perform exact matching on state for the subgroup of people with intellectual or developmental disabilities due to small sample sizes.

All targeted populations		Mental illness subgroup	
Variable	Level of control	Included	Level of control
Race (white, black, other or missing)	Propensity score	X	Propensity score
Age at time of transition	Propensity score	X	Propensity score
Rural zip code	Propensity score	X	Propensity score
Number of conditions identified in the year prior to transition (CDPS), <sup>b</sup> broken out by quartile	Propensity score	X	Propensity score
ED visit not resulting in an inpatient admission in the year prior to transition	Propensity score	X	Propensity score
ED visit resulting in an inpatient admission in the year prior to transition	Propensity score	X	Propensity score
Inpatient admission within 12 months pre-transition	Propensity score	X	Propensity score
Physician visit 30 days pre-transition	Propensity score	X	Propensity score
Physician visit, ED visit, or inpatient admission for dehydration, fall, delirium, or pressure ulcer pre-transition	Propensity score	X	Propensity score
Physician visit, ED visit, or inpatient admission for pressure ulcer pre-transition	Propensity score	X	Propensity score
Mental health condition identified prior to transition <sup>a</sup>	Propensity score		Propensity score
Community-based LTSS use pre-transition	Propensity score	X	Propensity score
Months of institutional LTSS pre-transition: 3, 4, 5, 6, or more	Propensity score	X	Propensity score
Dually Medicare-Medicaid eligible at the time of transition	Propensity score	X	Propensity score
Total expenditure 12 months prior to transition (logged)	Propensity score	X	Propensity score
Total medical expenditure 12 months prior to transition (logged)	Mahalanobis	X	Mahalanobis
Total LTSS expenditure 12 months prior to transition (logged)	Mahalanobis	X	Mahalanobis
Total ED expenditure 12 months prior to transition (logged)	Propensity score	X	Propensity score
Total HSP expenditure 12 months prior to transition (logged)	Propensity score	X	Propensity score
Total IP expenditure 12 months prior to transition (logged)	Propensity score	X	Propensity score
Total physician expenditure 12 months prior to transition (logged)	Propensity score	X	Propensity score
Low NF-MDS level of care <sup>a,c</sup>	Propensity score	X	Propensity score
NF-MDS ADL summary score (0–28): 0–5, 6–13, 14–19, 20–28 <sup>a</sup>	Propensity score	X	Propensity score

Note: NF-MDS variables only included for people transitioning from nursing facilities. The ADL summary score captures a beneficiary's ability to perform the following ADLs independently: personal hygiene, locomotion, toilet use, eating, dressing, bed mobility, and transferring. The measure ranges from 0 to 28, with lower scores representing greater independence.

<sup>a</sup> Only included in the analysis of people transitioning from nursing facilities.

<sup>b</sup> The CDPS is a hierarchical diagnostic classification system developed to describe the severity of illness among Medicaid beneficiaries (Kronick et al. 2000). Using ICD-9 diagnosis codes, the CDPS constructs major categories based on body systems (such as cardiovascular) or condition (such as diabetes).

<sup>c</sup> See Ross et al. (2012) for details on the construction of the level of care indicators.

ADLs = activities of daily living; CDPS = Chronic Disability and Payment System; ED = emergency department; HSP = hospice; IP = inpatient; LTSS = long-term services and supports; NF-MDS = Nursing Facility Minimum Data Set.

**Assessment of the quality of the match.** Using matching to select a comparison group will produce unbiased estimates if two assumptions are met: (1) the set of observable characteristics used in the matching procedure includes all the factors that are related to both participation and the outcomes and (2) participants and comparison group members are “balanced” on observable characteristics conditional on their propensity score within each stratum—that is, for each participant, there must be a matched comparison group member(s) similar to the participant on observed characteristics (Rosenbaum and Rubin 1985). To determine whether the latter condition was met, we performed several statistical tests to assess the quality of our matches.

Following Stuart (2010), we examined standardized differences, defined as the difference of sample means in the MFP and matched comparison subsamples as a percentage of the square root of the average of sample variances in both groups (Rosenbaum and Rubin 1985), of all matching variables. We summarize these results in Table B.1, which indicates the standardized difference of each covariate before and after matching. Rubin (2001) recommends ensuring that the standardized bias for all covariates is less than 0.25. We found the covariate balance in the matched data set met this criterion for all variables in each of the three target populations as well as the mental illness subgroup. In most cases, the standardized bias was less than a stricter cutoff of 0.10. These results indicate that our procedure produced matched comparison groups of other transitioners who had characteristics similar to those of MFP participants for each of the covariates included in the model.

Although matching improved the covariate balance, some small differences remained between the MFP participants and other transitioners. These differences motivated us to further adjust the propensity scores and covariates in the final regression models.

**Pre-transition demographics, enrollment, and health indicators.** Table A.2 reports the pre-transition characteristics of the MFP participants and the matched sample of other transitioners used in our analyses. Our matched groups of other transitioners have similar pre-transition characteristics compared to the MFP participants, indicating our matching procedure worked well.

The data in Table A.2 also illustrate why we conducted separate analyses by targeted population. Compared to people transitioning from nursing facilities, those with intellectual disabilities were younger, resided in institutions longer before transitioning, and had much higher pre-transition expenditures. Dual Medicare-Medicaid eligibility was more common among people transitioning from nursing facilities, mainly because more than 90 percent of people older than age 65 in our sample were enrolled in Medicare. Mental health conditions were most prevalent among older and younger adults transitioning from nursing facilities. Beneficiaries transitioning from nursing facilities were much more likely to use community-based LTSS in the year before the transition relative to those with intellectual disabilities.

**Table A.2. Pre-transition demographics, enrollment, and health indicators for a weighted sample of MFP participants and a matched comparison group of other transitioners**

Characteristics	Older adults		Persons with physical disabilities		Persons with intellectual or developmental disabilities	
	MFP	Other transitioners	MFP	Other transitioners	MFP	Other transitioners
<b>Sample size</b>						
Number ( <i>n</i> ) of observations	1,945	4,008	3,475	4,187	2,110	1,873
Mental health conditions (%)	69	72	72	72	45	52
<b>Characteristics</b>						
Age (mean)	76	76	51	51	45	44
Female (%)	65	70	46	46	39	39
Dual Medicare-Medicaid status (%)	96	96	48	49	59	60
Number of CDPS conditions (mean)	10	10	9	8	6	6
Low level of care needs (%)	21	24	24	27	2	2
<b>Transition year (%)</b>						
2010	37	42	38	51	46	57
2011	40	39	41	34	40	32
2012	23	19	21	15	15	11
<b>Pre-transition indicators</b>						
Used community-based LTSS prior to transition (%)	21	25	11	17	7	12
> 6 months in institution (%)	82	81	89	87	97	93
6-month total expenditures (\$)	48,994	52,311	47,401	49,374	72,487	68,738
IP admission (%)	56	56	50	52	16	20
ED visit (%)	60	61	61	62	37	42

Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 from 32 states.

Note: Unless noted, characteristics of MFP participants and other transitioners are weighted based on a propensity score-matching approach described in more detail in the Comparison group selection discussion above on page 25. Care needs, use of community-based LTSS, months institutionalized, expenditures, IP admissions, and ED visits were all assessed during the 12 months before the transition.

CDPS = Chronic Illness and Disability Payment System algorithm (used to identify chronic conditions); ED = emergency department; ID/DD = intellectual or developmental disabilities; IP = inpatient; low level of care need = lowest category of three-level score for care needs based on the Resource Utilization Group.

**Post-matching regression adjustments.** After identifying our matched comparison group of other transitioners, we estimated a series of regression models with the matched data. Each model adjusted for all covariates that we included in the propensity score model to control for any differences in these variables that persisted after matching. Regression models for all expenditure measures were specified as hierarchical linear models in a difference-in-differences framework, as reflected in Equation 1:

$$(1) \quad Y_{ijk} = \beta_0 + \beta_1 MFP_i + \beta_2 I(\text{period}_j = 1) + \beta_3 I(\text{period}_j = 2) + \beta_4 MFP_i * I(\text{period}_j = 1) + \beta_5 MFP_i * I(\text{period}_j = 2) + \gamma X_{ik} + b_k + b_{ik} + \epsilon_{ijk}$$

Here,  $j$  represents the index observation period (0 = baseline period, 1 = one year after transition, 2 = two years after transition);  $i$  represents the index beneficiary; and  $k$  represents the index state.  $Y_{ijk}$  represents the per-beneficiary-per-month (pbpm) cost for period  $j$  of beneficiary  $i$  from state  $k$  (pbpm).  $MFP_i$  is a binary indicator for the MFP group.  $X_{ijk}$  are additional covariates controlled for in the model. The list of covariates depends on the beneficiary group and is identical to the one used to calculate propensity scores listed in Table A.1. Items  $b_k$  and  $b_{ik}$  are random effects at the state and beneficiary levels, respectively.

Each model included data from the pre-transition, 12 months post-transition, and 13- to 24-months post-transition periods. We included random intercepts at the state level to control for clustering within each state because Medicaid programs and MFP demonstrations have state-specific differences that likely affect outcomes. In the difference-in-difference framework, we included an indicator for MFP participation, indicators for one and two years after transition (pre-transition is the baseline), and their interactions. The coefficient for the interaction terms ( $\beta_4$  and  $\beta_5$ ) are the treatment effects of interest.  $\beta_4$  is the expected difference in the change in outcome from pre-transition to one year after transition comparing MFP participants to the comparison group of other transitioners, holding all control variables constant. We are also interested in  $\beta_5$ , the expected difference in the change in outcome from pre-transition to two years after transition comparing MFP participants to other transitioners, holding all control variables constant. In addition, we estimated  $\beta_5 - \beta_4$ , the difference in change in outcome from one year to two years post-transition. For ease of interpretation, we present  $\beta_4$  and  $\beta_5 - \beta_4$  in Tables 2 and 3, respectively.

**Study limitations** This study has several important limitations, many of which have been previously discussed in great detail (Bohl et al. 2014). The most important limitation has been the availability of data. This study excluded 25 to 48 percent of MFP participants because of issues with missing data or incomplete claims history. A few beneficiaries residing in nursing facilities were excluded because of missing or incomplete NF-MDS data, the nursing home assessment data. Another small number, mainly in New York, was excluded because of puzzling utilization patterns that we thought could be a data anomaly. We also continued to exclude beneficiaries in managed care because their claims information does not have the same level of detail as fee-for-service claims. Use of hospice services and mortality limited the analysis to those who survived at least two full years after the initial transition. These exclusions are likely to influence our results, but the direction of that influence is not clear.

**APPENDIX B: ADDITIONAL TABLES AND FIGURES**

**Table B.1. Means and standardized differences of matching variables**

Variable	Older adults				Persons with physical disabilities				Persons with intellectual or developmental disabilities			
	PC mean	MC mean	T mean	Std diff	PC mean	MC mean	T mean	Std diff	PC mean	MC mean	T mean	Std diff
State (32 states)	-	-	-	0.00	-	-	-	0.00	-	-	-	0.00
Age older than 65	96.4%	100.0%	100.0%	0.00	0.0%	0.0%	0.0%	0.00	6.6%	8.1%	10.8%	0.10
Female	71.2%	69.6%	65.4%	-0.09	53.4%	45.9%	46.4%	0.01	43.4%	38.8%	39.1%	0.01
Race												
White	56.6%	67.8%	68.5%	0.01	57.1%	63.3%	60.5%	-0.06	69.9%	65.9%	65.2%	-0.02
Black	21.5%	23.4%	22.8%	-0.01	31.1%	26.9%	30.7%	0.08	21.4%	23.5%	23.1%	-0.01
Other or missing	21.9%	8.8%	8.7%	0.00	11.8%	9.8%	8.8%	-0.03	8.7%	10.6%	11.7%	0.04
Age at time of transition	76.77	76.10	75.84	-0.03	51.95	50.96	51.26	0.03	41.81	43.53	44.86	0.09
Rural zip code	21.3%	25.3%	26.2%	0.02	23.3%	20.9%	20.5%	-0.01	25.5%	31.1%	27.1%	-0.09
<b>Number of conditions identified in the year prior to transition (CDPS)</b>												
1st quintile	10.8%	13.0%	11.6%	-0.04	21.8%	27.5%	26.6%	-0.02	47.7%	52.8%	55.3%	0.05
2nd quintile	17.1%	19.3%	17.3%	-0.05	16.4%	17.6%	19.7%	0.05	18.0%	20.9%	18.8%	-0.06
3rd quintile	25.9%	25.6%	25.2%	-0.01	23.2%	22.9%	22.1%	-0.02	15.0%	13.4%	14.4%	0.03
4th quintile	28.0%	26.5%	28.1%	0.03	24.6%	20.2%	18.9%	-0.03	11.3%	8.0%	8.1%	0.00
5th quintile	18.3%	15.6%	17.7%	0.05	13.9%	11.7%	12.7%	0.03	8.0%	4.9%	3.5%	-0.06
ED visit resulting in an inpatient admission in the year prior to transition	23.5%	19.7%	19.5%	0.00	32.4%	26.8%	25.0%	-0.04	11.0%	8.8%	6.9%	-0.07
ED visit not resulting in an inpatient admission in the year prior to transition	59.6%	55.8%	54.9%	-0.02	71.1%	59.8%	58.8%	-0.02	43.0%	39.8%	35.8%	-0.08
Inpatient admission within 12 months pre-transition	63.0%	55.6%	55.7%	0.00	67.7%	51.5%	50.5%	-0.02	26.9%	20.0%	15.9%	-0.10
Physician visit 30 days pre-transition	27.7%	26.4%	26.8%	0.01	28.8%	28.6%	28.8%	0.01	27.5%	20.0%	20.8%	0.02
Physician visit, ED visit, or inpatient admission for dehydration, fall, delirium, or pressure ulcer pre-transition	30.3%	25.9%	24.7%	-0.03	27.1%	17.0%	16.9%	0.00	12.1%	6.9%	7.1%	0.00
Physician visit, ED visit, or inpatient admission for pressure ulcer pre-transition	2.8%	2.6%	3.0%	0.02	6.6%	4.0%	3.7%	-0.01	1.4%	0.8%	0.4%	-0.04
Mental health condition identified prior to transition	65.6%	71.7%	69.3%	-0.05	70.4%	71.5%	71.9%	0.01	59.4%	52.5%	45.5%	-0.14
Community-based LTSS use pre-transition	30.3%	24.7%	21.4%	-0.08	28.1%	16.5%	11.4%	-0.13	26.8%	11.6%	7.4%	-0.12
Months of institutional LTSS pre-transition												
3 months	30.3%	24.7%	21.4%	-0.08	28.1%	16.5%	11.4%	-0.13	26.8%	11.6%	7.4%	-0.12
4 months	9.6%	4.5%	3.5%	-0.04	5.5%	3.1%	2.8%	-0.01	3.0%	1.6%	0.8%	-0.06
5 months	18.6%	8.0%	6.7%	-0.04	14.7%	4.9%	3.2%	-0.06	6.6%	2.4%	1.1%	-0.07

**Table B.1. (continued)**

Variable	Older adults				Persons with physical disabilities				Persons with intellectual or developmental disabilities			
	PC mean	MC mean	T mean	Std diff	PC mean	MC mean	T mean	Std diff	PC mean	MC mean	T mean	Std diff
6 or more months	12.2%	6.7%	7.4%	0.02	10.6%	5.0%	4.5%	-0.02	4.6%	3.0%	1.3%	-0.11
Dually Medicare-Medicaid eligible at the time of transition	95.5%	96.1%	95.6%	-0.02	48.5%	49.1%	48.0%	-0.02	60.1%	59.6%	59.2%	-0.01
Total expenditure 12 months prior to transition (logged)	10.46	10.08	10.02	-0.04	9.60	8.07	7.53	-0.16	7.88	6.41	5.73	-0.21
Total medical expenditure 12 months prior to transition (logged)	10.42	10.61	10.62	0.01	10.61	10.82	10.85	0.05	11.35	11.49	11.61	0.16
Total LTSS expenditure 12 months prior to transition (logged)	11.42	11.34	11.35	0.02	11.32	11.26	11.28	0.04	11.58	11.60	11.69	0.14
Total ED expenditure 12 months prior to transition (logged)	2.93	2.80	2.72	-0.03	1.79	1.44	1.46	0.01	1.41	1.06	1.11	0.02
Total HSP expenditure 12 months prior to transition (logged)	0.02	0.01	0.05	0.08	0.01	0.01	0.02	0.04	0.01	0.01	0.00	-0.04
Total IP expenditure 12 months prior to transition (logged)	6.73	5.58	5.49	-0.02	5.30	4.11	3.85	-0.05	2.39	1.54	1.39	-0.04
Total physician expenditure 12 months prior to transition (logged)	4.93	4.66	4.65	0.00	2.52	2.38	2.34	-0.01	2.94	2.38	2.38	0.00
<b>Low NF-MDS level of care</b>												
No	80.0%	74.3%	77.0%	0.06	76.8%	69.7%	72.3%	0.06				
Yes	16.9%	23.8%	21.5%	-0.06	19.7%	27.2%	24.5%	-0.07				
Missing	3.1%	1.9%	1.5%	-0.03	3.5%	3.1%	3.2%	0.01				
<b>NF-MDS ADL summary score</b>												
0–5	19.4%	28.9%	29.4%	0.01	26.8%	37.0%	37.9%	0.02				
6–13	26.4%	27.0%	24.7%	-0.05	23.3%	20.9%	21.8%	0.02				
14–19	29.5%	26.0%	25.3%	-0.02	23.5%	20.4%	18.8%	-0.04				
20–28	21.5%	16.0%	18.7%	0.07	22.8%	18.4%	18.1%	-0.01				
Missing	3.2%	2.1%	1.9%	-0.01	3.6%	3.2%	3.3%	0.00				

Source: Mathematica analysis of MFP participants and other transitioners from 32 state grantees from 2010 through 2012.

ADLs = activities of daily living; CDPS = Chronic Disability and Payment System; ED = emergency department; HSP = hospice; IP = inpatient; LTSS = long-term services and supports; MC = matched comparison; NF-MDS = Nursing Facility Minimum Data Set; PC = potential comparison; T = treatment.

**Table B.2. Pre-transition demographics, enrollment, and health indicators for a weighted sample of MFP participants and a matched cohort of other transitioners with mental health conditions**

Characteristics	Older adults		Persons with physical disabilities		Persons with intellectual or developmental disabilities	
	MFP	Other transitioners	MFP	Other transitioners	MFP	Other transitioners
<b>Sample size</b>						
Number ( <i>n</i> ) of observations	1,348	2,757	2,497	2,934	960	1,135
<b>Characteristics</b>						
Age (mean)	75	75	51	52	45	46
Female (%)	67	71	50	50	41	41
Dual Medicare-Medicaid status (%)	97	97	55	58	70	72
Number of CDPS conditions (mean)	10	10	9	9	7	8
Low level of care needs (%)	19	21	22	24	4	4
<b>Transition year (%)</b>						
2010	35	39	38	51	46	53
2011	40	39	41	35	40	37
2012	25	22	21	15	14	11
<b>Pre-transition indicators</b>						
Used community-based LTSS before transition (%)	21	27	11	16	7	9
> 6 months in institution (%)	84	81	90	87	95	94
6-month total expenditures (\$)	49,677	53,233	47,473	49,511	66,426	67,804
IP admission (%)	57	57	54	53	22	21
ED visit (%)	63	64	65	62	47	46

Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional- to community-based LTSS from 2010 through 2012 from 32 states.

Note: Unless noted, characteristics of MFP participants and other transitioners are weighted based on a propensity score-matching approach described in more detail in Appendix A. Care needs, use of community-based LTSS, months institutionalized, expenditures, IP admissions, and ED visits were all assessed during the 12 months before the transition.

CDPS = Chronic Illness and Disability Payment System algorithm (used to identify chronic conditions); ED = emergency department; ID/DD = intellectual or developmental disabilities; IP = inpatient; Low level of care need = lowest category of three-level score for care needs based on the Resource Utilization Group.

**Table B.3. Change in per-beneficiary-per-month expenditures for MFP participants relative to a matched comparison group of other transitioners with mental health conditions from pre-transition to first year post-transition (in dollars)**

Expenditure category	Older adults		Persons with physical disabilities		Persons with intellectual or developmental disabilities	
	MFP	Other transitioners	MFP	Other transitioners	MFP	Other transitioners
Total	-1,414***	-2,576	-1,264***	-2,649	-1,954***	-3,751
Medicaid	-273***	-1,552	-1,031***	-2,084	-1,918***	-3,725
Medicare	-1141	-1,024	-233*	-565	-36	-26
Total LTSS	-346***	-1,646	-1,061***	-2,354	-2,075***	-3,908
Community-based LTSS	2,743***	1,327	3,206***	1,741	7,236***	5,438
Institutional LTSS	-3,089	-2,972	-4,267*	-4,095	-9,311	-9,346
Total medical	-1,068	-931	-203	-295	121	157
Inpatient	-485	-447	-268*	-465	-47	9
SNF	-917***	-673	-416	-411	-111	-74
Home health	479***	372	258*	224	46*	29
ED	8**	2	11**	4	8*	5
Physician	34*	30	30	27	25	23

Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional to community-based LTSS from 2010 through 2012 from 32 states.

Note: The matched sample of other transitions is based on a propensity score-matching approach described in more detail in Appendix A. The results show the change in monthly expenditures post transition. We tested whether these changes differ between the MFP and other transitioner groups.

\*  $p < 0.05$ ; \*\*  $p < 0.001$ ; \*\*\*  $p < 0.0001$ .

ED = emergency department; ID/DD = intellectual or developmental disabilities; LTSS = long-term services and supports; SNF = skilled nursing facility.

**Table B.4. Change in per-beneficiary-per-month expenditures for MFP participants relative to a matched comparison group of other transitioners with mental health conditions from one to two-years post-transition (in dollars)**

Expenditure category	Older adults		Persons with physical disabilities		Persons with intellectual or developmental disabilities	
	MFP	Other transitioners	MFP	Other transitioners	MFP	Other transitioners
Total	-720**	157	-999***	280	-60***	1,298
Medicaid	-559***	550	-981***	309	-109***	1,452
Medicare	-159	-393	-17	-28	50*	-154
Total LTSS	-633***	568	-1,101***	458	-221***	1,423
Community-based LTSS	-1,156***	-170	-1,409***	-60	-117***	1,358
Institutional LTSS	523**	738	307*	517	-104	64
Total medical	-87*	-411	102*	-177	161*	-125
Inpatient	69*	-106	17	86	31*	-107
SNF	-5*	-121	9	-10	7	-29
Home health	-257	-233	-93*	-125	-11	-22
ED	-3*	0	0	-2	-2	0
Physician	-11	-11	-1	-2	1	-1

Source: Mathematica's analysis of Medicaid and Medicare claims and enrollment data for Medicaid beneficiaries who transitioned from institutional to community-based LTSS from 2010 through 2012 from 32 states.

Note: The matched sample of other transitions is based on a propensity-score-matching approach described in more detail in Appendix A. The results show the change in monthly expenditures post-transition. We tested whether these changes differ between the MFP and other transitioner groups.

\*  $p < 0.05$ ; \*\*  $p < 0.001$ ; \*\*\*  $p < 0.0001$ .

ED = emergency department; ID/DD = intellectual or developmental disabilities; LTSS = long-term services and supports; SNF = skilled nursing facility.