Unintended Consequences of Statewide, Mandatory MLTSS Implementation: Evidence of Increased Informal Care Provision*

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Abstract

This paper examines the effects of statewide, mandatory Medicaid Managed Long-Term Services and Supports (MLTSS) programs, which I refer to as Statewide Mandatory Programs (SMPs), on informal eldercare provision in the United States. I link state-level Medicaid policy data with data from the 2011-2019 collections of the core American Time Use Survey (ATUS) and its associated eldercare module. I limit the sample to only those respondents who reported providing eldercare at least once in the past three months and leverage variation in the timing and geography of SMP rollout to estimate difference-in-differences models that capture changes in both primary (main task) and secondary (simultaneous task) eldercare at the intensive (minutes of care) and extensive (any care) margins. Results indicate that SMP implementation is associated with a significant increase in primary eldercare, particularly among middle- and higher-income households. In contrast, secondary eldercare provision declines or remains unchanged across most groups. These patterns suggest that while SMPs aim to streamline formal long-term care through managed care organizations (MCOs), they may also generate behavioral spillovers that increase reliance on informal caregiving, especially among families with the resources to substitute away from MCO-provided services. The findings underscore the importance of considering how Medicaid delivery reforms interact with household dynamics and caregiving capacity across the income distribution.

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1 Introduction

The U.S. Census Bureau projects that by 2030, the global population of individuals aged 65 and older will reach approximately 1 billion, or 12 percent of the total population, rising to 1.6 billion by 2050 (Roberts et al., 2018). In contrast with the growth of the older population is the projected stagnant population of people under age 20 and the moderate increase in the working age population. This trend is mirrored within the United States as well, where the number of people aged 65 and older is expected to grow from over 50 million to 95 million by 2060, while the youth population remains relatively stagnant (Mather et al., 2019). This rapid demographic shift suggests that the U.S. will face a dramatic increase in demand for long-term care services and support for the aging population in the coming decades, especially as older adults live longer and experience higher rates of disability or chronic illness. Thus, the ways in which the U.S. finances and delivers long-term care is an increasingly urgent policy question with significant implications for families and labor markets.

Traditionally, long-term care has been provided through both formal and informal care mechanisms. Formal caregivers are trained professionals who are paid for their services and usually employed in nursing homes, assisted living facilities (ALFs), or home health agencies. These long-term care services are financed through federal and state tax revenue. Informal care, on the other hand, refers to the unpaid assistance provided to dependent persons by someone with whom they have a social relationship, such as their spouse, child, or parent (Van Groenou & De Boer, 2016). In this paper, I use the term 'informal caregiver' to refer to an adult child who provides unpaid care to their elderly or otherwise dependent parent.

Informal caregiving is a critical component of the U.S. care infrastructure, often filling the gaps left by limited public funding or long waitlists for formal services. Research suggests that informal care acts as a substitute for formal care: for example, older adults with more children are less likely to enter nursing homes (Noël-Miller, 2010). The provision of informal care, however, comes at a cost for caregivers. As

the need for informal caregiving arises, working women may be more likely to reduce, pause, or indefinitely discontinue their employment in order to devote time to caregiving responsibilities. Berecki-Gisolf et al. (2008) found that for mid-aged Australian women in 2001-2004, women who took up informal caregiving more often reduced their participation in the workforce as compared to women who did not provide informal care. Jacobs et al. (2017) performed a similar study in the US and found that women who provide "at least 20 hours of informal care per week" were more likely to retire early relative to other women. Ciccarelli and Van Soest (2018) examine the differential impact of informal caregiving on men and women, finding that in Europe, "daily caregiving did not significantly affect employment or work hours" for men, but it did significantly decrease both the probability of being employed and work hours for women. Thus, women disproportionately undertake caregiving responsibilities, often reducing their work hours or exiting the labor market to care for aging family members, decisions which have long-term implications for their earnings, career progression, and retirement security. As the demand for eldercare rises, public programs that offer structured, accessible long-term care services may help alleviate this burden, if not directly reducing labor market penalties associated with informal caregiving.

Long-Term Services and Supports (LTSS) programs delivered through Medicaid are one such solution. Over the past several decades, Medicaid's role in delivering long-term care has undergone a substantial transformation, most relevantly with the rise of Managed Long-Term Services and Supports (MLTSS) programs ("Managed Long-Term Services and Supports," 2018). While Medicaid has historically reimbursed LTSS through fee-for-service models, states are increasingly turning to MLTSS to promote care coordination and reduce public spending. Under MLTSS, states contract with private Managed Care Organizations (MCOs), which receive capitated payments to deliver various covered long-term care services. Many states have adopted statewide, mandatory programs (SMPs) that require all eligible beneficiaries to receive services through managed care. Proponents argue that SMPs promote efficiency while critics

point to possible trade-offs; MCOs may limit provider networks, restrict access to high-need services, or engage in "cream-skimming" to contain costs (Long-Term Services and Supports Quality Measures, 2025). Persistent provider shortages and weak enforcement of regulatory standards may further limit access to care. These structural challenges raise important questions about how MLTSS policies shape families' caregiving decisions, especially for those with fewer resources to supplement or opt out of managed care.

This paper investigates the impact of SMP implementation on informal eldercare provision in the United States. I link data from the 2011 to 2019 collections of the American Time Use Survey (ATUS) with state-level policy adoption timelines obtained from Medicaid records. I limit my sample to the subset of ATUS respondents who completed its associated eldercare module (which asks additional questions about their caregiving responsibilities) and reported providing some form of eldercare within the three months prior to the survey. I use a multivariate difference-in-differences model to estimate how SMP implementation influences primary and secondary eldercare provision at both the intensive and extensive margins for these informal caregivers. I also analyze effects by household income level, as low-income families likely have fewer resources to supplement or substitute formal care. This study contributes to literature on the intersection of formal long-term care provision and family caregiving, offering insight into the spillover effects of MLTSS programs on household behavior.

2 Policy Background

2.1 Medicaid's Role in LTSS

Medicaid is the largest public payer for long-term services and supports (LTSS) in the United States, providing critical assistance to low-income elderly and disabled individuals. LTSS accounts for nearly one-third of total Medicaid expenditures and includes services such as home health care, personal care assistance, and nursing facility care

(Congressional Research Service, 2021). Eligibility for Medicaid-funded LTSS is determined by both financial and functional need, with eligible individuals typically earning incomes at or below 138 percent of the federal poverty level and experiencing difficulties in performing activities of daily living.

Medicaid's current role in LTSS is the result of nearly a century of evolving federal and state policy. In establishing the Old Age Assistance program, the 1935 Social Security Act brought about the growth of private nursing homes and laid the groundwork for later expansions of social welfare programs, including the creation of Medicaid in 1965 (Tuck & Moore, 2019; Centers for Medicare & Medicaid Services, 2025). The earliest iterations of Medicaid-funded LTSS programs further popularized formal care provision outside the home by mandating nursing facility coverage while offering minimal home-based alternatives ("Managed Long-Term Services and Supports," 2018). However, this began to shift with the introduction of Section 1915(c) waivers in 1981, which allowed states to fund home- and community-based services (HCBS) as alternatives to institutional care. HCBS aims to help older adults and people with disabilities remain in their homes or communities rather than institutions, and a range of medical and supportive services (including personal care, home health aides, and adult day care) are covered. The shift to HCBS was further accelerated in 1999, when the Supreme Court's decision in Olmstead v. L.C. required states to serve individuals in the "most integrated setting appropriate" (Office For Civil Rights, 2025). As a result, HCBS has grown from 10 percent of Medicaid LTSS expenditures in the late 1980s to 62 percent by 2024 (Kaiser Family Foundation, 2024).

2.2 Managed LTSS

A more recent shift in Medicaid's role as the primary payer of LTSS in the U.S. has been the adoption of Managed Long-Term Services and Supports (MLTSS) programs, which integrate LTSS delivery into Medicaid managed care, shifting away from fee-for-service reimbursement to capitated payments ("Managed Long-Term Services and

Supports," 2018). Under MLTSS programs, states contract with private Managed Care Organizations (MCOs) that receive a capitated (i.e., fixed, per-member) payment to deliver all covered services to eligible enrollees. While Medicaid managed care has long been used for physical and behavioral health services, its application to LTSS is newer and varies widely in scope, with some states adopting county-level or voluntary MLTSS models, while others implement statewide mandatory programs (SMPs), requiring most or all LTSS-eligible beneficiaries in the state to receive services through MCOs (Pavle et al., 2017; Cheek, 2011). States' adoption of MLTSS programs are largely driven by an effort to rebalance expenditures toward home-based care, improve care coordination through unified delivery systems, and enhance budget predictability ("Managed Long-Term Services and Supports," 2018; Kaiser Family Foundation, 2024).

Figures 1 and 2 below illustrate state-level adoption of MLTSS programs in 2011, at the start of the period analyzed in this paper, and in 2019, the final year of the analytic window. Table 7 includes a more detailed history of state MLTSS adoption throughout this period (see Appendix).The expansion of MLTSS over this time reflects its growing role as a delivery mechanism for LTSS and underscores the relevance of studying its potential spillover effects on informal care.

2.3 Consequences of MLTSS

It is important to note that MLTSS programs come with trade-offs related to access and quality of care. Proponents argue that capitated payments can improve efficiency, shift care away from expensive institutional settings (such as nursing homes and assisted living facilities), and thus contain costs. Critics, however, raise concerns that these incentives can lead MCOs to limit provider networks, restrict access to high-need services, and engage in 'cream skimming' (ie, selectively enroll healthier, lower-risk individuals and avoid enrollment of individuals with high medical needs in an effort to maximize profits and minimize costs) (Long-Term Services and Supports Quality Measures, 2025). To mitigate these risks, federal regulations mandate network ade-

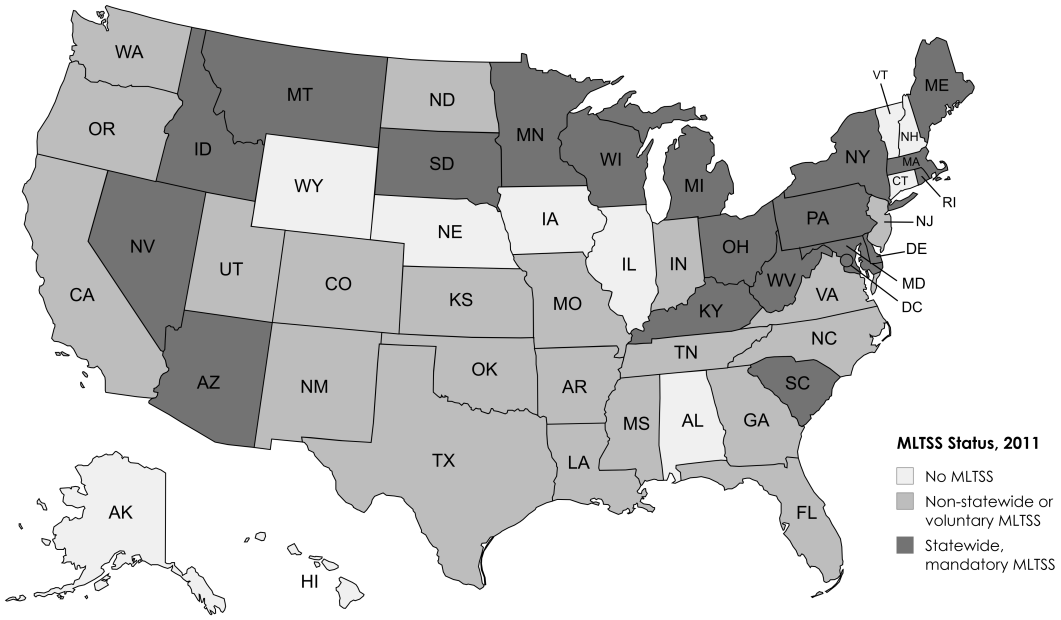

Figure 1: U.S. States with Managed LTSS Programs (2011)

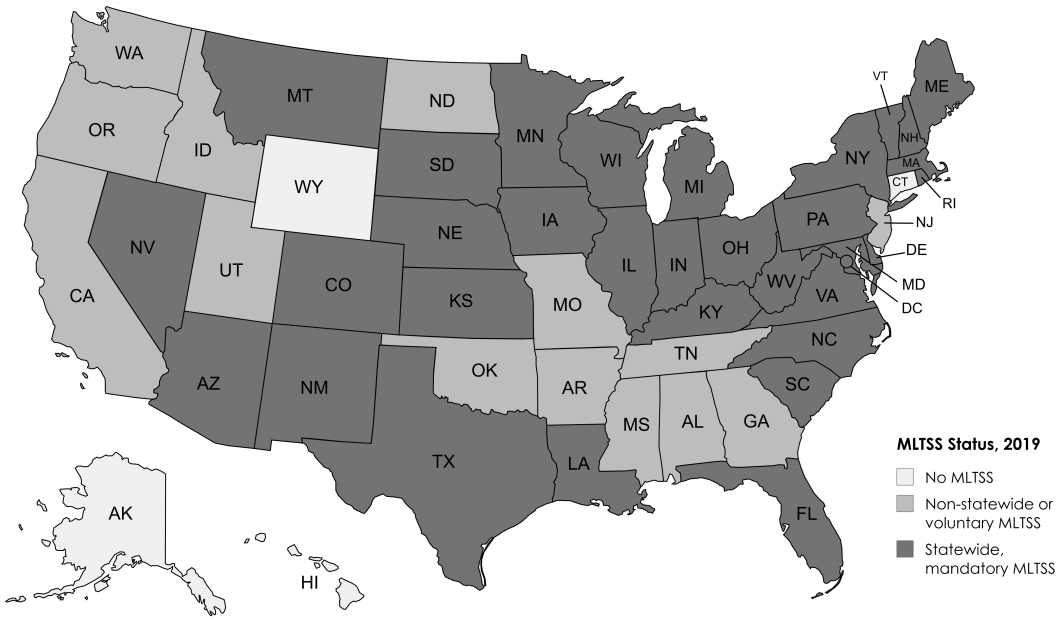

Figure 2: U.S. States with Managed LTSS Programs (2019)

quacy standards, and some states impose financial penalties tied to performance outcomes (CMS, 2022). However, enforcement is uneven, and penalties are often too small to fully deter cream-skimming (Long-Term Services and Supports Quality Measures, 2025). Persisting shortages of healthcare workers, especially in rural and high-cost areas, also limit provider availability, and these structural risks likely have consequences for families (Kaiser Family Foundation, 2024)

Gaps in formal care (either as a result of MCO cream-skimming or the inherent healthcare worker shortage) delay or reduce access to services and may force families to provide informal care (MACPAC, 2022; Cheek, 2011; Examining Medicaid Managed Long-Term Service and Support Programs, 2013). Similar patterns have been observed in other managed care markets, such as Medicare Advantage, where efforts to control costs result in restricted access to more intensive services (Brown et al., 2014). Even when formal services are technically available, perceptions of lower quality or complex administrative barriers to entry may lead families to rely more heavily on informal care. However, not all families can afford to opt out of MLTSS networks. Caregivers often have to reduce their hours worked or indefinitely leave the workforce in order to care for an elderly parent, and this is likely not feasible for lower-income households (Cheek, 2011; Examining Medicaid Managed Long-Term Service and Support Programs, 2013). Middle- and higher-income families, on the other hand, can more easily opt out of MLTSS networks, as the costs of informal care provision pose less of a financial burden. Alternatively, those in higher-income households may choose to utilize private caregiving services and avoid undertaking caregiving responsibilities. These dynamics highlight the need to assess the differential impacts of MLTSS implementation across socioeconomic groups.

Although MLTSS adoption has grown significantly in the past decade, current research has mostly focused on MLTSS's administrative and cost outcomes, with limited attention to how these programs impact patterns of informal care (MACPAC, 2022; Cheek, 2011). This paper aims to address this gap by examining how the adoption

of Statewide, Mandatory MLTSS Programs (SMPs) influences informal eldercare provision. Using a difference-in-differences approach, I compare caregiving outcomes in states before and after SMP implementation and against states that did not adopt SMPs during the same period. In other words, I examine whether MLTSS programs, when implemented in a statewide, mandatory fashion, substitute for or displace informal care, and whether these effects differ by household income.

3 Empirical Strategy

I employ a generalized difference-in-differences (DD) analysis to explore the effects of statewide, mandatory MLTSS programs on informal eldercare provision. I restrict my main analysis to those respondents who reported providing eldercare at least once in the prior three months, though not all respondents reported providing care in the past 24 hours. My analysis distinguishes between the impacts on the number of minutes of primary and secondary eldercare provision, as well as the extensive margin for both primary and secondary caregiving. I estimate separate models for each of these outcomes to capture their distinct effects. My DD models contrast changes in the outcomes for caregivers before and after implementation of statewide, mandatory managed care programs to those for corresponding caregivers in control states. I cluster standard errors at the state level, as this is where the policy variation exists, and the error terms of individuals within the same state may be correlated. The basic DD specification takes the form:

$$\begin{aligned} Y_{ij} = \alpha &+ \gamma(\text{STATEWIDE} \times \text{MANDATORY})_{ij} + \delta_1 \text{STATEWIDE}_{ij} \\ &+ \delta_2 \text{MANDATORY}_{ij} + \delta_3 \text{HCBS}_{ij} + \delta_4 X_i \\ &+ \delta_5 T_t + \delta_6 R_i + \epsilon_{ij} \end{aligned} \tag{1}$$

where Y is the dependent variable for respondent i living in state j, representing one of the four outcomes of interest. The outcome variables are measures of primary

and secondary eldercare provision, both on the extensive and intensive margins. On the extensive margin, the outcome variable Y_{ij} is a dichotomous variable taking on a value of 0 or 1 depending on whether an individual has provided eldercare in the past 24 hours. On the intensive margin, Y_{ij} is a continuous time variable that reflects how many minutes of eldercare the respondent provided in the past 24 hours.

STATEWIDE $\times$ MANDATORY is the key interaction term, and $\widehat{\gamma}$ provides the difference-in-differences estimate of primary interest, capturing the effect of statewide, mandatory MLTSS implementation in a given state; STATEWIDE is an indicator set to one after the implementation of a statewide MLTSS program in a given state; MANDATORY is an indicator set to one after the implementation of a mandatory MLTSS program in a given state; HCBS is a dummy variable which controls for whether the MLTSS program in the respondent's state covers HCBS; X is a vector of supplementary, individual-level covariates (including age and sex) that may influence caregiving behavior; T represents year fixed effects to control for any national or time-specific trends that could influence informal caregiving; R represents region fixed effects, which account for any regional differences in caregiving patterns or policy implementation that might bias the estimates; ϵ is the error term.

I hypothesize that SMP implementation will increase informal caregiving, particularly among middle- and higher-income households with the means to opt out of managed care due to concerns over service quality. For low-income households, I expect minimal change in informal care, as these families may lack the resources or flexibility to substitute formal care even when SMPs are in place. To capture the heterogeneity in the effects of statewide, mandatory MLTSS programs across income groups, I run separate models for different household income categories: less than \$35,000, \$35,000 to \$75,000, \$75,000 to \$100,000, and over \$100,000. These income groups are chosen based on their varying exposure to the MLTSS program's potential impacts, as caregivers in different income groups may alter their caregiving behavior differently due to shifts in Medicaid eligibility and service availability.

The inclusion of state fixed effects instead of region fixed effects would be ideal, as they allow for more precise control over unobserved, location-specific factors that may influence informal care provision. For instance, though states may adopt managed care contracts as part of SMP implementation, the structure of those contracts may not be uniform across states due to existing differences in Medicaid administration, long-term care infrastructure, or political approach to Medicaid programs. These variations are not fully captured by the broader regional fixed effects. However, in this case, state fixed effects are not feasible due to limited variation in MLTSS adoption across states. Results from regression analyses which included state fixed effects (and are not reported in this paper) displayed high collinearity between the difference-in-differences estimate and the state fixed effects. As a second-best approach, I use region fixed effects to account for broader geographic differences in caregiving behaviors and policy environments. Although they are less granular, they still help reduce bias from unobserved regional variation and allow for identification of the treatment effect.

4 Data

To conduct my analyses, I construct a panel combining individual-level data from the American Time Use Survey (ATUS), an annual survey conducted by the U.S. Census Bureau for the Bureau of Labor Statistics, with state-level Medicaid long-term care policy data. I obtained the 2011-2019 collections of the core ATUS and the associated eldercare modules from the Integrated Public Use Microdata Series (IPUMS) which simplifies the use of ATUS data through the IPUMS Time Use data extractor (IPUMS time use, n.d.).

The core ATUS is a set of time diaries from a cross-sectional sample of the civilian, non-institutionalized U.S. population (Kolpashnikova et al., 2021). The sample of ATUS respondents is drawn from the respondents in the Current Population Survey (CPS), and individuals are asked to report all activities they engaged in during the 24-hour period from 4 am on the previous day until 4 am on the reporting day in sequential

order. The amount of time respondents spend completing various activities, such as "paid work, unpaid domestic work, care activities, leisure, [and] sleep," is recorded and linked to information collected in the CPS, including "labor force participation, household composition, and socioeconomic status" (Kolpashnikova et al., 2021).

In addition to the core survey, ATUS respondents answer questions as part of various topical modules, one of which focuses on eldercare provision (Kolpashnikova et al., 2021). The eldercare module was first introduced in 2011, when all ATUS respondents were asked whether in the three to four months prior to the interview they "provided adult care to anyone who needed help because of a condition related to aging or an existing condition that worsens with age" (Kolpashnikova et al., 2021). Those who did provide such care were then asked to give information regarding the duration and intensity of care provision, as well as their relationship with the care recipient (e.g., Is the recipient the parent, grandparent, or spouse of the respondent? Does the recipient live with the respondent? etc.). Thus, the ATUS and its eldercare module provide a wealth of information regarding care provision and the demographic characteristics of caregivers.

To construct my analysis sample, I limited the original full sample of all ATUS respondents between 2011 and 2019 to just those who also completed the eldercare module. This reduced my sample size from over 100,000 respondents to around 17,000. All respondents in the analysis sample are people who reported providing eldercare at least once in the three months prior to completing the survey[1]. This group consists of 6,843 men (39.39 percent) and 10,529 women (60.61 percent). This slight inequality in gender distribution is not surprising, as women are more likely to act as caregivers (Guardian, 2023). Information regarding the age and household earnings of respondents are collected as part of the core ATUS and are summarized in the figures and tables below:

[1]As such, the sample reflects an endogenously selected group (those who are actively engaged in caregiving) potentially excluding individuals whose relatives receive sufficient formal care through Medicaid (e.g., via nursing home coverage). This selection may disproportionately capture cases where formal services are unavailable, inadequate, or supplemented by informal care.

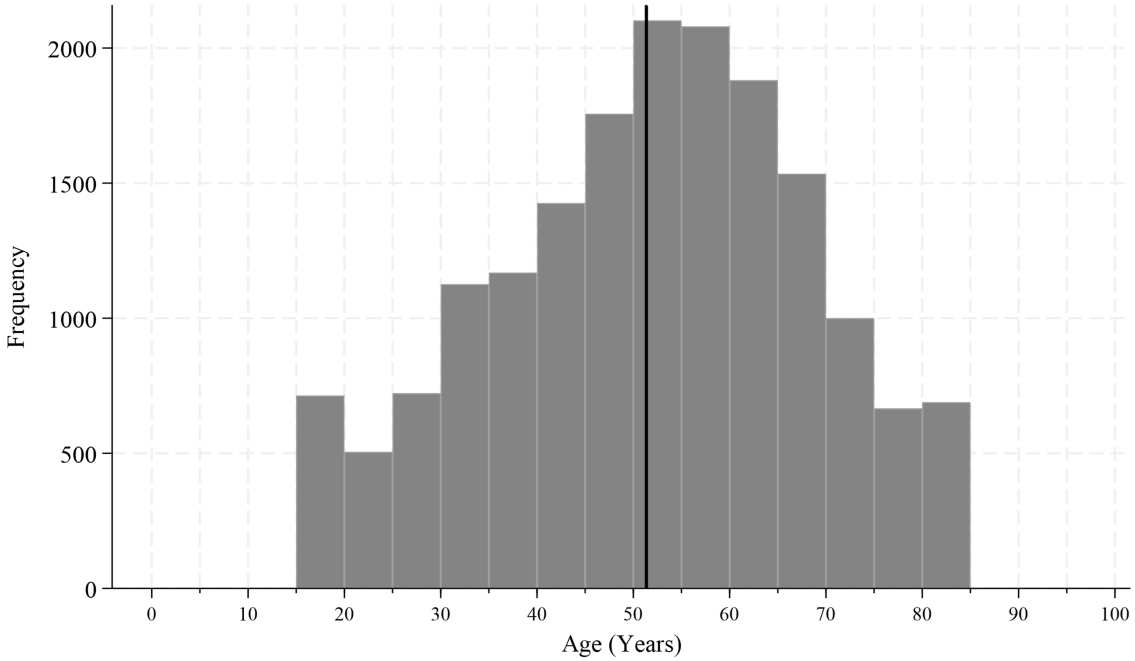

Figure 3: Age Distribution of Caregivers

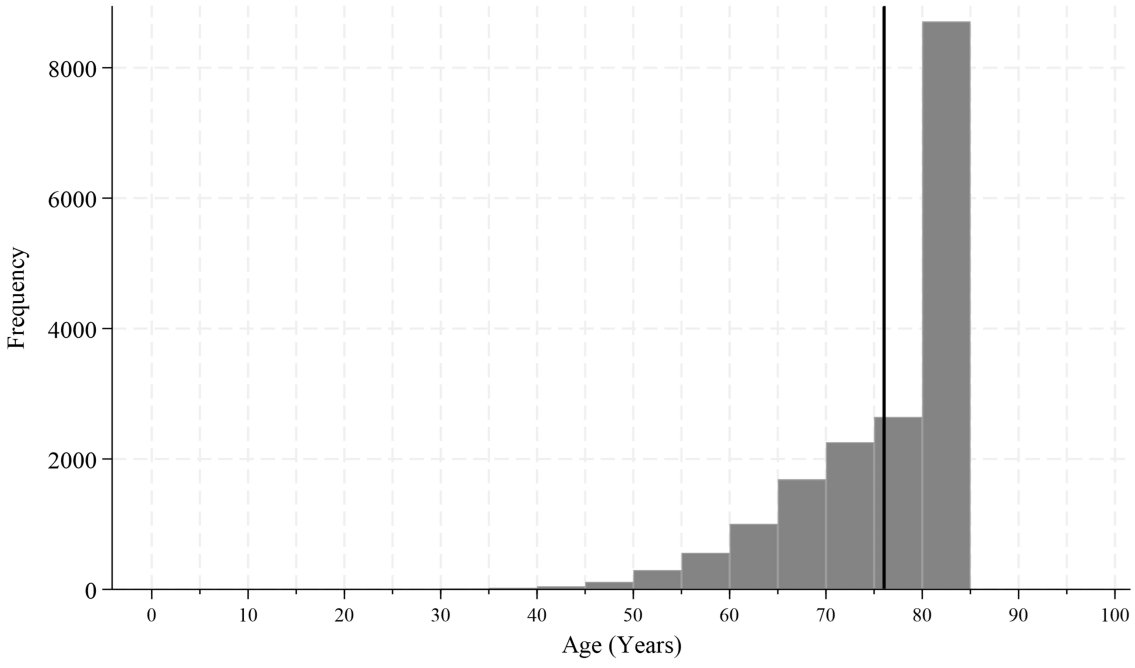

Figure 4: Age Distribution of Care Recipients

Based on Figure 3, the sample is a relatively older subset of adults. This age distribution, centered around 51 years, is expected, as the analysis sample has been

restricted to respondents providing eldercare to their elderly and dependent parents, whose need for living assistance likely begins their mid-to-late 70s and 80s. The age distribution of eldercare recipients (collected as part of the ATUS eldercare module) is displayed in Figure 4 and shows a left skew with most individuals falling between 80-85 years old. Again, this is expected, as the mean age for people entering care facilities is 84, and their entry is typically preceded by escalating caretaking at home (Lam et al., 2023).

It is important to note that household income, sometimes referred to as family income in this paper, is reported for the caregiving household, not the household receiving care, and it is the income of the latter which primarily determines an individual's Medicaid eligibility.

Household Income	Percentage
Less than $35,000	30.4
Between $35,000 and $75,000	32.0
Between $75,000 and $100,000	12.2
Over $100,000	25.4

Table 1: Household Income Distribution of Sample

Approximately one third of individuals in the sample reported annual household incomes less than $35,000, while another reported incomes between $35,000 and $75,000. Around 12 percent of respondents reported incomes between $75,000 and $100,000, and one fourth reported incomes over $100,000.

In addition to these and other demographic characteristics, respondents were also asked questions regarding care provision. Because the sample analyzed in this paper consists of individuals who reported providing some form of eldercare (either primary or secondary) within the three months before the survey was conducted, not all individuals reported providing eldercare in the previous 24 hours.

Figure 5 displays the proportion of respondents who reported providing eldercare at various frequencies. A numeric summary of Figure 5 can be found in Table 8 (see Appendix).

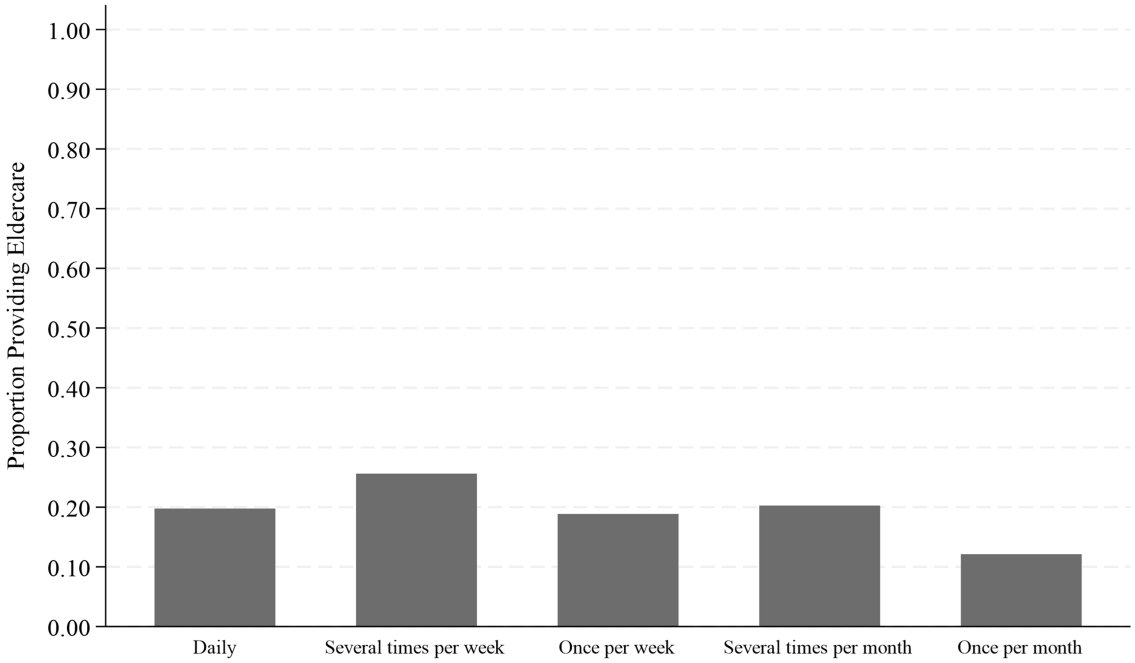

Figure 5: Proportion of Respondents Providing Eldercare, by Frequency of Care Provision

Nearly 50 percent of respondents reported providing some form of eldercare several times per week, and almost 90 percent reported providing care on a weekly or near-weekly basis.

Figures 6 and 7 below display the mean values of the outcome variables on both the intensive and extensive margins, disaggregated by year and distinguishing between primary and secondary eldercare. A numeric summary of Figures 6 and 7 can be found in Table 9 (see Appendix).

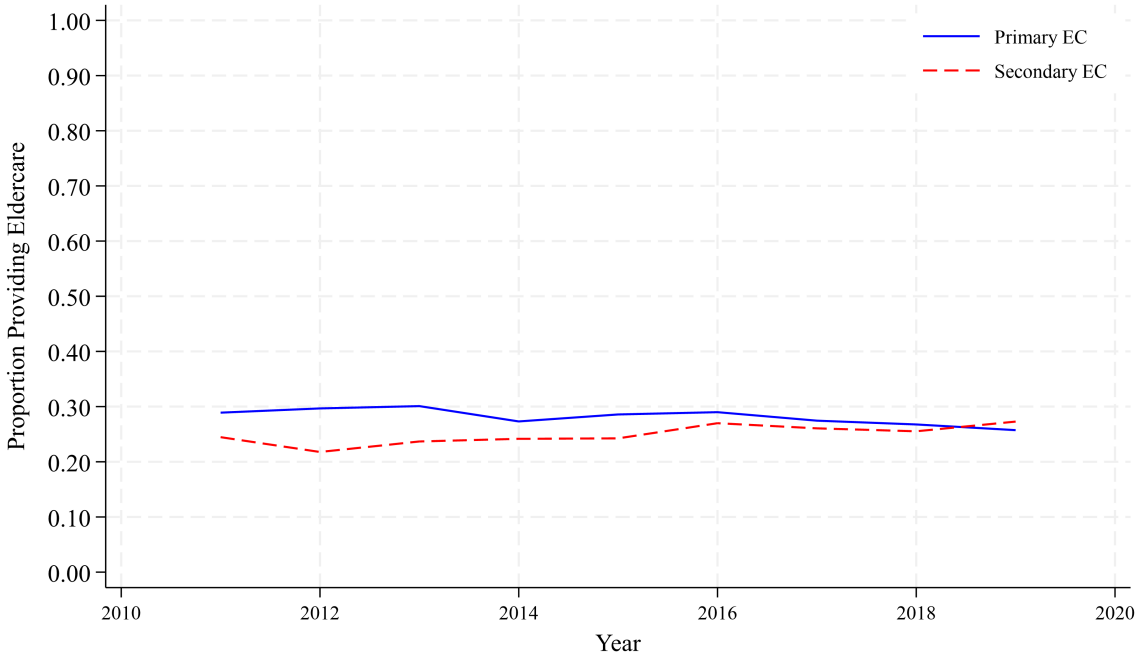

Figure 6: Proportion of Respondents Who Reported Providing Any Eldercare in the Previous 24 Hours, by Year

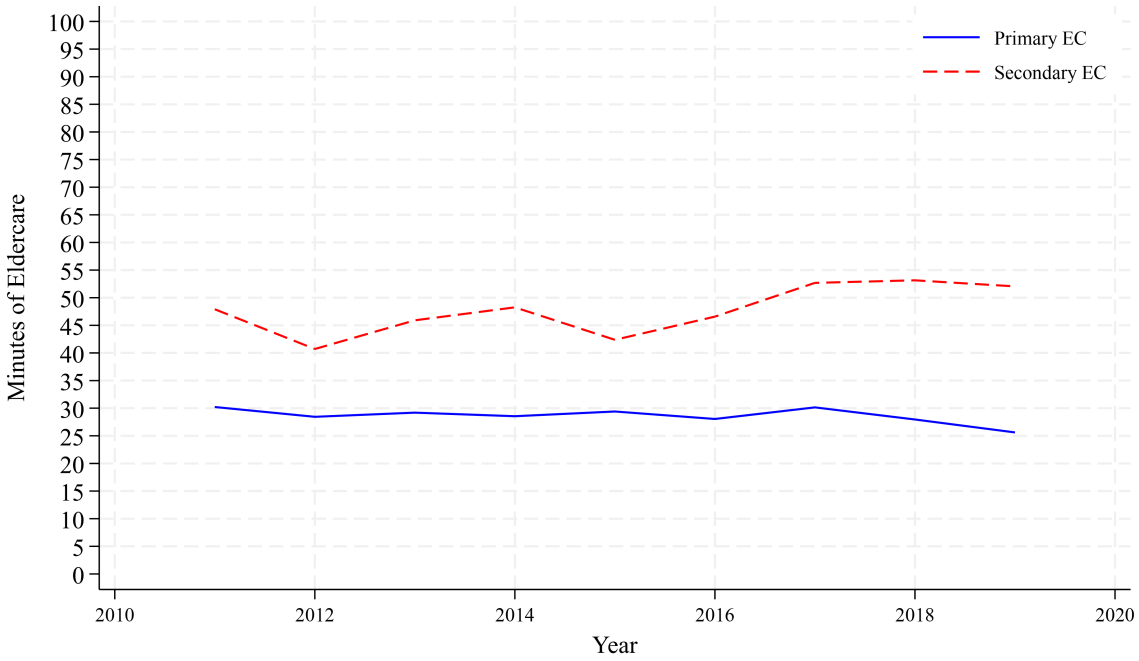

Figure 7: Average Minutes of Total Eldercare Provided in the Previous 24 Hours, by Year

Figure 6 above displays the proportion of respondents who reported providing eldercare in the previous 24 hours, disaggregated by year. In 2011, a higher proportion of respondents reported primary eldercare provision, though by 2019, more respondents were engaging in secondary eldercare as compared to primary eldercare.

Figure 7 above shows the average number of minutes respondents spent engaged in eldercare in the previous 24 hours, disaggregated by year. The number of minutes respondents spent providing primary eldercare experienced a small, gradual decline, decreasing from approximately 30 minutes in 2011 to 25 minutes in 2019. The number of minutes respondents spent providing secondary eldercare, on the other hand, appeared to be more volatile, experiencing increases and decreases throughout the period. In 2011, respondents reported on average around 47 minutes of secondary eldercare provision. By 2019, the average number of minutes had increased to around 53 minutes. Throughout the period, the average number of minutes spent providing secondary eldercare remained noticeably higher than the number of minutes spent in primary eldercare.

Figures 8 and 9 below display the mean values of the outcome variables on both the intensive and extensive margins, disaggregated by region and distinguishing between primary and secondary eldercare. A numeric summary of Figures 8 and 9 can be found in Table 10 (see Appendix).

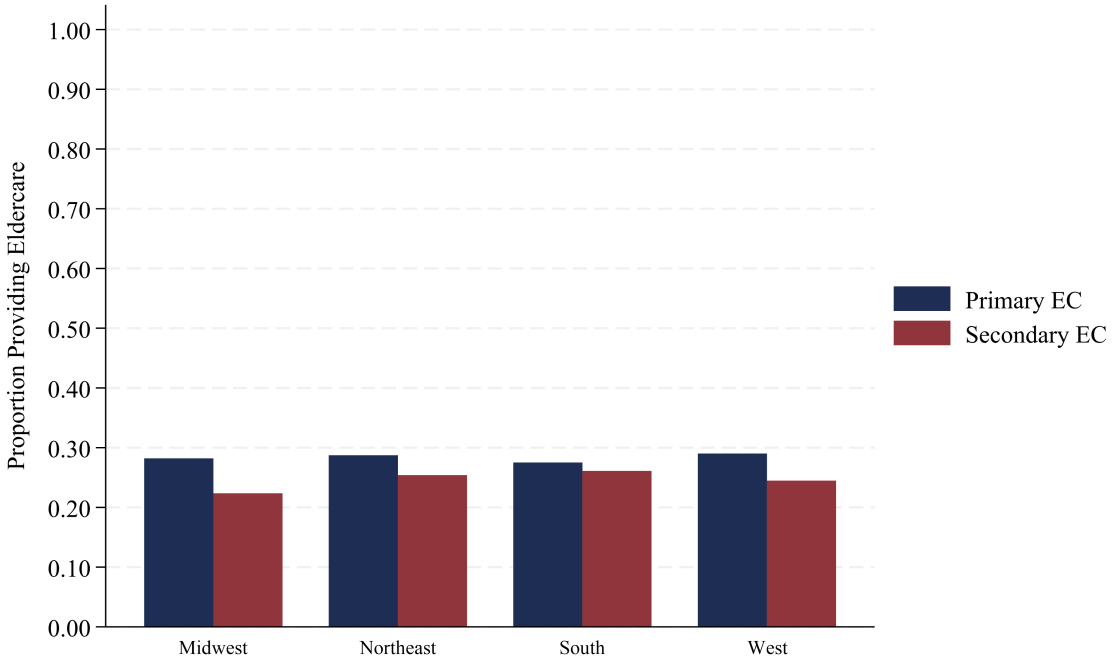

Figure 8: Proportion of Respondents Who Reported Providing Any Eldercare in the Previous 24 Hours, by Region

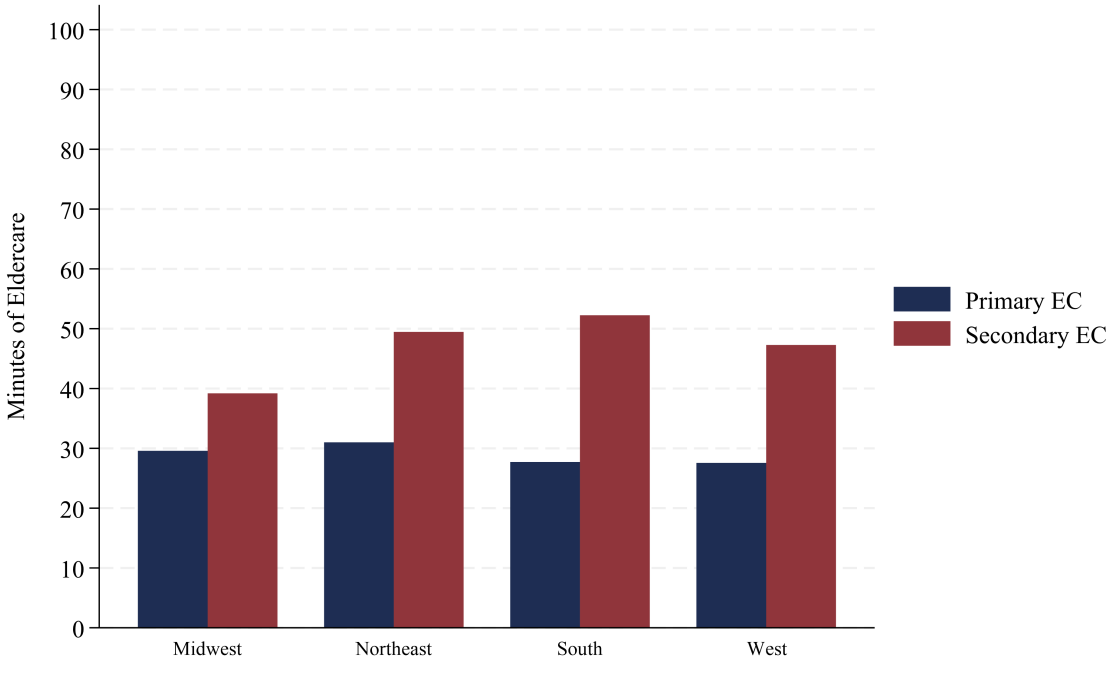

Figure 9: Average Minutes of Total Eldercare Provided in the Previous 24 Hours, by Region

Figure 8 above displays the proportion of respondents who reported providing eldercare in the previous 24 hours, disaggregated by region. The proportions of respondents providing primary care appear relatively similar across regions, ranging from approximately 27-29%. The proportions of respondents providing secondary care is smaller across all regions, ranging from around 22-26%, though the difference in proportions of primary and secondary eldercare provision is noticeably larger in the Midwest compared to other regions, especially the South. This could point to differences in the regional norms surrounding family dynamics and caregiving.

Figure 9 above displays the average number of minutes respondents spent engaged in eldercare in the previous 24 hours, disaggregated by region, and lends credence to the theory that there exist differences in the regional norms surrounding family dynamics and caregiving. The number of minutes respondents spent providing primary care appears relatively similar across regions, ranging from approximately 27-30 minutes. On the other hand, the number of minutes respondents spent providing secondary care varied more widely across all regions, ranging from around 40 minutes in the Midwest to over 50 in the South.

Figures 10 and 11 below display the mean values of the outcome variables on both the intensive and extensive margins, disaggregated by type of eldercare and distinguishing between SMP implementation status. Numeric summaries of these figures can be found in Table 11 (see Appendix).

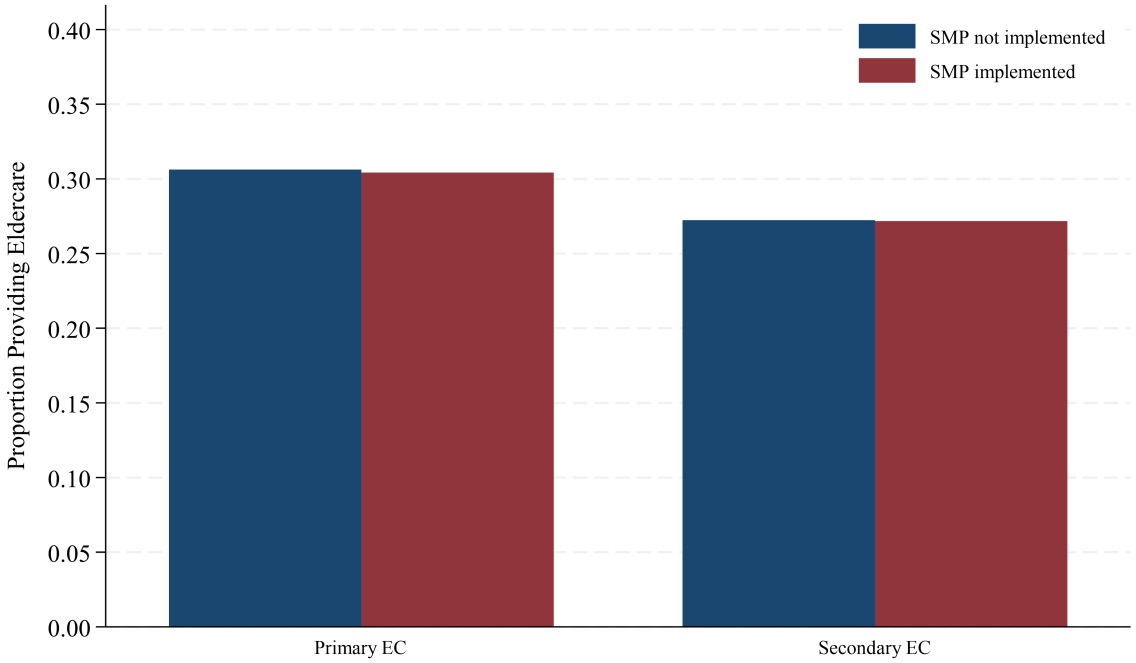

Figure 10: Proportion of Respondents Who Reported Providing Eldercare in the Previous 24 Hours, by Type of Eldercare

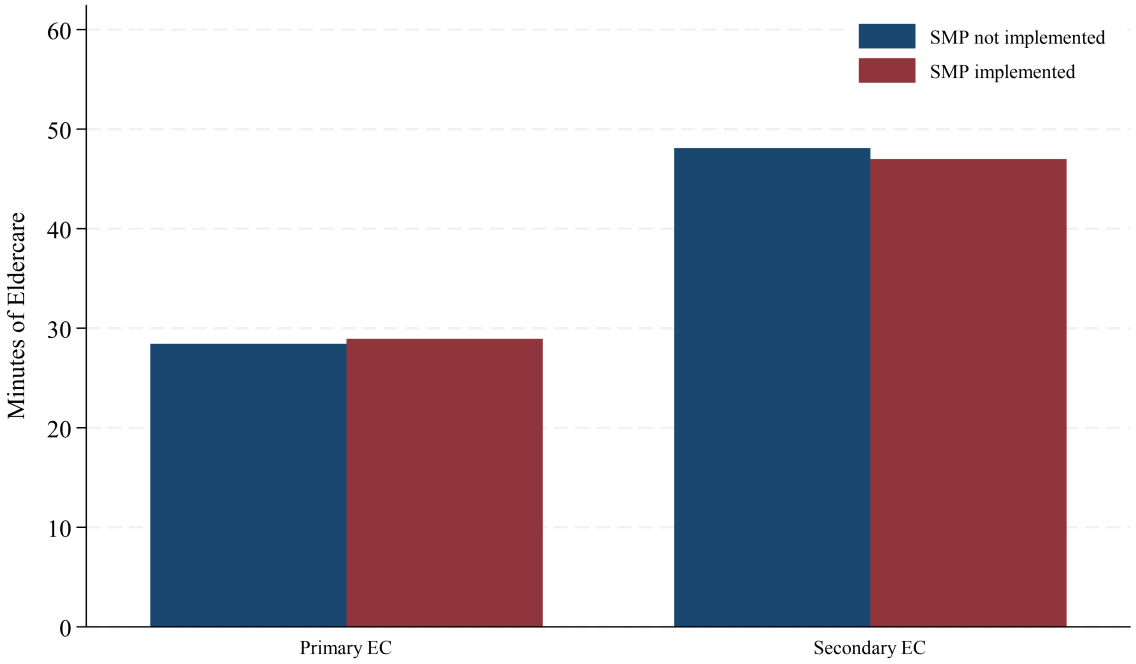

Figure 11: Average Minutes of Eldercare Provided in the Previous 24 Hours, by Type of Eldercare

Figure 10 above displays the proportion of respondents who reported providing eldercare in the previous 24 hours, disaggregated by type of eldercare and distinguishing between SMP implementation status. The proportions of respondents providing primary care appear almost the same before and after SMP implementation. The same is true for the proportion of respondents engaging in secondary eldercare provision.

Figure 11 above displays the number of minutes that respondents reported providing eldercare in the previous 24 hours, disaggregated by type of eldercare and distinguishing between SMP implementation status. It suggests a similar pattern for the change in the number of minutes of eldercare provision (i.e., little to no change).

Thus, Figures 10 and 11 do not suggest that the means of the outcome variables differ noticeably with the implementation of a statewide, mandatory program. However, when disaggregating by household income, as in Figures 12 and 13 below, the differences in means before and after implementation become more pronounced, especially for the higher income groups. A numerical summary of Figures 12 and 13 is available in Table 12 (see Appendix).

Figure 12 below displays the proportion of respondents who reported providing eldercare in the previous 24 hours, with separate graphs for each income group and disaggregated by care type and SMP implementation.

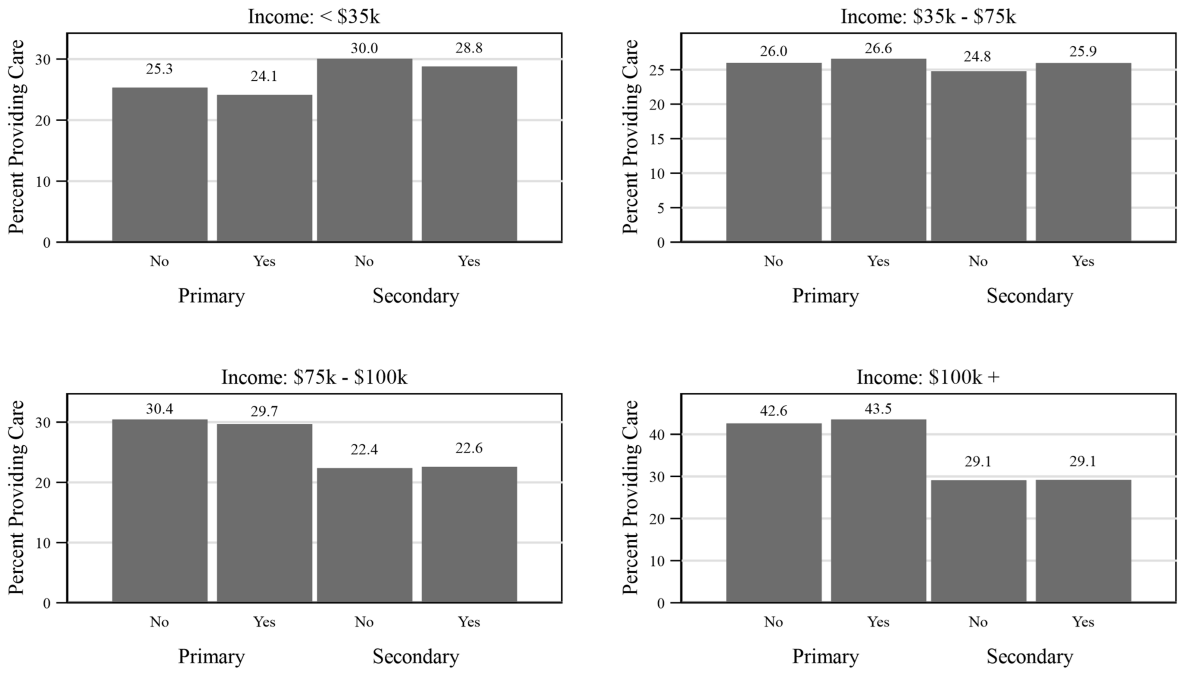

Figure 12: Proportion of Respondents Who Reported Providing Eldercare in the Previous 24 Hours, by Income, Type of Eldercare, and SMP Implementation

The figure shows small declines in the proportion of respondents engaging in both types of care provision after SMP implementation for those caregivers with household incomes less $35,000 and small increases in the proportion of respondents engaging in both types of care provision after SMP implementation for those caregivers with household incomes between $35,000 and $75,000. On the other hand, the proportion of respondents engaging in both types of care are relatively similar before and after SMP implementation for caregivers with household incomes between $75,000 and $100,000 and above $100,000.

Figure 13 below displays the average number of minutes that respondents reported providing eldercare in the previous 24 hours, with separate graphs for each income group and disaggregated by care type and SMP implementation. The figure shows a noticeable decline in the number of minutes of secondary care provision after SMP implementation for those caregivers with household incomes less $35,000, while the number of minutes spent providing primary care does not appear to change notably. This is also true for caregivers with household incomes between $35,000 and $75,000;

the number of minutes of reported care provision does not appear to change following SMP implementation. Unexpectedly, the number of minutes respondents spent providing care decreased following SMP implementation for caregivers with household incomes between $75,000 and $100,000. This is not in line with my hypotheses or the results of regressions (seen later in this paper) and could be a result of outliers in the caregiving data. Finally, the number of minutes respondents spent providing care increased following SMP implementation for caregivers with household incomes above $100,000, mirroring previously discussed expectations.

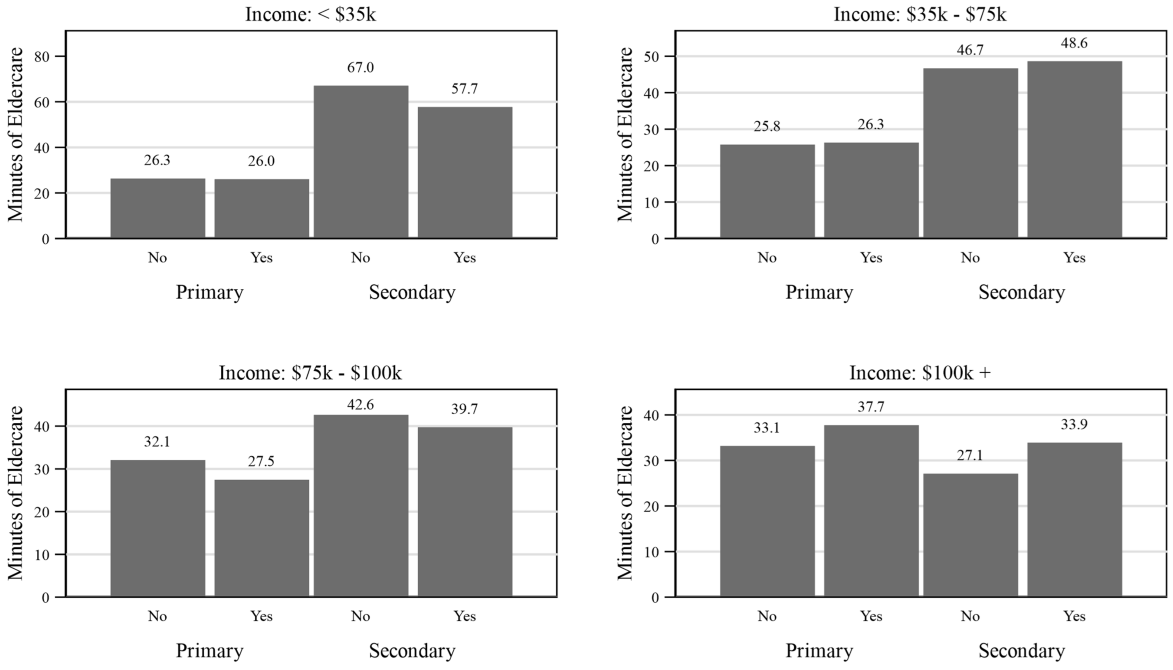

Figure 13: Average Minutes of Eldercare Provided in the Previous 24 Hours, by Income, Type of Eldercare, and SMP Implementation

These preliminary patterns suggest that the relationship between SMP implementation and eldercare provision varies across income groups, warranting a more rigorous investigation. To test the significance of these observed differences, I employ multivariate DD analysis, controlling for time and region fixed effects and various demographic characteristics of caregivers. The results of these regressions are presented in the following section.

5 Results

The estimated effects of SMP implementation on eldercare provision are presented across a series of regressions, examining both primary and secondary care at the intensive and extensive margins. Later results are stratified by household income brackets to capture potential heterogeneity in effects. In all models, $\widehat{\gamma}$, the coefficient on the STATEWIDE × MANDATORY term, captures the estimated change in eldercare provision following the implementation of a statewide, mandatory MLTSS program. This DD estimate is the primary focus of analysis and is interpreted across care types (primary and secondary), care margins (intensive and extensive), and household income brackets.

Table 2: Effect of SMP on Eldercare Provision, All Incomes

	(A) Primary Eldercare		(B) Secondary Eldercare	
	(1) Intensive Margin	(2) Extensive Margin	(1) Intensive Margin	(2) Extensive Margin
STATE WIDE	-1.770	-0.0124	-0.755	0.0196
	(2.005)	(0.0125)	(3.975)	(0.0131)
MANDATORY	-6.614**	-0.0489**	4.314	0.0496**
	(2.155)	(0.0148)	(3.710)	(0.0146)
STATE WIDE x MANDATORY	7.626*	0.0624**	-6.310	-0.0612**
	(3.112)	(0.0208)	(6.051)	(0.0182)
HCBS	-0.257	0.0110	4.080	0.00938
	(2.046)	(0.0113)	(2.412)	(0.00872)
AGE	-1.025***	-0.00729***	1.193***	0.00363***
	(0.0444)	(0.000321)	(0.0644)	(0.000188)
FEMALE	14.56***	0.0848***	5.226*	0.0237**
	(1.064)	(0.00625)	(2.296)	(0.00767)
Time Fixed Effects	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes
Constant	75.66***	0.597***	-13.27*	0.0417**
	(3.816)	(0.0252)	(5.490)	(0.0148)
Observations	17281	17281	17281	17281
R-sq	0.058	0.0785	0.0212	0.0235

Standard errors in parentheses

*** p < 0.05, ** p < 0.01, *** p < 0.001**

When examining the full sample, the results in Table 2 above suggest that SMP implementation is associated with an increase in primary eldercare provision at both the intensive and extensive margins. In Panel A, Column 1, $\widehat{\gamma}$ is positive and statistically significant, with a coefficient of 7.626, indicating that, on average, caregivers spent around 7.6 more minutes providing primary eldercare following SMP implementation.

This represents an approximate 10% increase in time spent providing primary eldercare. Column 2 shows a similar trend: the likelihood of engaging in any primary eldercare also increases, with a $\widehat{\gamma}$ of 0.0624 suggesting that there is a 6.24 percentage point (10.5%) increase in the likelihood of primary eldercare provision, and that more individuals began providing such care post-implementation. Together, these findings suggest that a statewide transition to mandatory MCOs may have induced greater primary eldercare provision among informal caregivers.

The effects on secondary eldercare provision, however, appear to diverge from the pattern observed for primary care. As shown in Panel B of Table 2, the estimate of $\widehat{\gamma}$ in Column 1, -6.310, is insignificant, suggesting no meaningful change in the number of minutes spent providing secondary eldercare after SMP implementation. In contrast, Column 2 reveals a consistent and statistically significant 6.12 percentage point decline in the probability of engaging in secondary eldercare. This suggests that while total time spent may not have shifted substantially, fewer individuals are participating in secondary eldercare activities post-SMP implementation. One possible interpretation is that the managed care model may have centralized or formalized certain services, reducing the perceived need for more peripheral caregiving efforts. However, the increases in primary care provision on both the intensive and extensive margins suggest that caregivers may instead be compelled to engage in more active care, perhaps due to concerns about quality of care provided by an MCO, and so they are less likely to engage in eldercare as a secondary activity.

When disaggregating the analysis by income, notable heterogeneity emerges. Among caregivers in households earning less than $35,000 annually, the implementation of SMP appears to have little to no effect on eldercare provision, as $\widehat{\gamma}$ is statistically insignificant across all models in Table 3 below.

Table 3: Effect of SMP on Eldercare Provision, Incomes less than $35k

	(A) Primary Eldercare		(B) Secondary Eldercare	
	(1) Intensive Margin	(2) Extensive Margin	(1) Intensive Margin	(2) Extensive Margin
STATE WIDE	-4.504	-0.0116	1.198	0.0310
	(2.940)	(0.0144)	(8.765)	(0.0226)
MANDATORY	-7.524	0.0196	-5.974	0.0301
	(3.744)	(0.0179)	(6.261)	(0.0241)
STATE WIDE x MANDATORY	9.037*	-0.0164	-5.606	-0.0653
	(4.114)	(0.0239)	(11.35)	(0.0339)
HCBS	3.212	0.0173	8.930	0.00900
	(2.425)	(0.0171)	(6.270)	(0.0155)
AGE	-0.959***	-0.00700***	0.986***	0.00261***
	(0.0461)	(0.000314)	(0.0957)	(0.000369)
FEMALE	18.39***	0.133***	-5.522	-0.0144
	(1.900)	(0.0110)	(4.776)	(0.0158)
Time Fixed Effects	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes
Constant	67.01***	0.511***	10.36	0.159***
	(4.591)	(0.0299)	(10.27)	(0.0339)
Observations	5446	5446	5446	5446
R-sq	0.0655	0.107	0.0165	0.0171

Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

This lack of change may indicate that lower-income households, already likely to rely heavily on Medicaid, are constrained in their options and tend to accept the services provided by their assigned MCOs without altering their caregiving behavior. In other words, because their Medicaid eligibility or access is less likely to be affected by the policy shift, behavioral responses to SMP implementation are muted.

In contrast, for households earning between $35,000 and $75,000, results suggest more pronounced behavioral adjustments.

Table 4: Effect of SMP on Eldercare Provision, Incomes between $35k and $75k

	(A) Primary Eldercare		(B) Secondary Eldercare	
	(1) Intensive Margin	(2) Extensive Margin	(1) Intensive Margin	(2) Extensive Margin
STATE WIDE	-0.00898	-0.00552	-10.72	0.00858
	(3.073)	(0.0189)	(5.958)	(0.0186)
MANDATORY	-10.89**	-0.0808***	11.78*	0.0416*
	(3.226)	(0.0202)	(4.709)	(0.0185)
STATE WIDE x MANDATORY	11.22*	0.105***	-5.952	-0.0405
	(4.701)	(0.0271)	(9.009)	(0.0261)
HCBS	0.996	0.00677	2.705	-0.00151
	(2.985)	(0.0147)	(4.856)	(0.0158)
AGE	-1.014***	-0.00680***	1.439***	0.00415***
	(0.0793)	(0.000446)	(0.133)	(0.000315)
FEMALE	11.67***	0.0790***	3.027	0.0164
	(1.929)	(0.0139)	(3.707)	(0.0124)
Time Fixed Effects	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes
Constant	68.79***	0.515***	-14.00	0.0215
	(6.324)	(0.0381)	(9.746)	(0.0313)
Observations	5711	5711	5711	5711
R-sq	0.0598	0.0748	0.0312	0.0282

Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 4 shows that primary eldercare provision increases significantly on both the intensive and extensive margins. In both Column 1 and Column 2 of Panel A, $\widehat{\gamma}$ is positive and statistically significant, indicating an 11.2 minute (16.3%) increase in primary eldercare provision and a 10.5 percentage point (20.4%) increase in the likelihood of provision, suggesting that SMP implementation may have increased informal caregiving in this income bracket. However, the corresponding estimates for secondary eldercare, presented in Columns 1 and 2 of Panel B, are insignificant (and negative), indicating that the observed changes in caregiving behavior are concentrated in more direct forms of care.

Households with incomes between $75,000 and $100,000 display a similar shift toward primary care provision in response to SMP implementation. Column 2 of Panel A in Table 5 below indicates a significant increase in primary eldercare provision on the extensive margin, with an 11.5 percentage point (17.9%) increase in the likelihood of care provision. Column 2 of Panel B shows a significant decline in secondary eldercare provision on the extensive margin, with a 14.8 percentage point decrease in the likeli-

hood of care provision. There is no significant change on either of the intensive margins. These patterns may reflect a substitution effect or a shift in caregiving responsibility within families of this income group (families potentially less reliant on Medicaid but still marginally affected by the structure of MLTSS programs).

Table 5: Effect of SMP on Eldercare Provision, Incomes between $75k and $100k

	(A) Primary Eldercare		(B) Secondary Eldercare	
	(1) Intensive Margin	(2) Extensive Margin	(1) Intensive Margin	(2) Extensive Margin
STATE WIDE	-1.790	-0.0170	21.24	0.0761*
	(4.816)	(0.0269)	(13.80)	(0.0372)
MANDATORY	-3.365	-0.101**	8.456	0.0853*
	(5.359)	(0.0321)	(11.20)	(0.0321)
STATE WIDE x MANDATORY	0.598	0.115**	-25.52	-0.148*
	(6.684)	(0.0382)	(23.26)	(0.0595)
HCBS	-8.237	-0.00437	-2.746	-0.0142
	(7.111)	(0.0345)	(8.307)	(0.0284)
AGE	-1.012***	-0.00796***	0.915***	0.00377***
	(0.106)	(0.000758)	(0.179)	(0.000672)
FEMALE	19.81***	0.101***	17.11**	0.0592**
	(2.776)	(0.0166)	(5.592)	(0.0212)
Time Fixed Effects	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes
Constant	80.50***	0.643***	-4.060	0.00688
	(9.491)	(0.0595)	(19.34)	(0.0625)
Observations	2171	2171	2171	2171
R-sq	0.0679	0.087	0.0231	0.036

Standard errors in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001

This distinct phenomenon is evident among households earning more than $100,000 per year, as well.

Table 6: Effect of SMP on Eldercare Provision, Incomes over $100k

	(A) Primary Eldercare		(B) Secondary Eldercare	
	(1) Intensive Margin	(2) Extensive Margin	(1) Intensive Margin	(2) Extensive Margin
STATE WIDE	0.972	-0.0234	0.613	-0.0144
	(3.749)	(0.0266)	(4.278)	(0.0199)
MANDATORY	-1.109	-0.0693*	10.31*	0.0722***
	(3.693)	(0.0305)	(4.350)	(0.0183)
STATE WIDE x MANDATORY	5.475	0.0965*	-4.009	-0.0492
	(5.713)	(0.0428)	(7.353)	(0.0258)
HCBS	-3.645	0.0173	2.609	0.0422
	(3.006)	(0.0242)	(4.129)	(0.0228)
AGE	-1.132***	-0.00769***	1.056***	0.00371***
	(0.108)	(0.000621)	(0.154)	(0.000394)
FEMALE	11.89***	0.0368**	9.573**	0.0460***
	(2.267)	(0.0128)	(3.377)	(0.0129)
Time Fixed Effects	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes
Constant	91.36***	0.746***	-31.17**	-0.0144
	(7.358)	(0.0435)	(9.316)	(0.0356)
Observations	3953	3953	3953	3953
R-sq	0.0494	0.0608	0.0246	0.0295

Standard errors in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001

As shown in Column 2 of Panel A in Table 6 above, the likelihood of providing primary eldercare increases significantly, by 9.65 percentage points (12.9%), following SMP implementation, though the intensive margin remains unaffected. This suggests that caregivers in higher-income households (who care for individuals who may already have been less reliant on Medicaid) have increased flexibility to provide informal care, and choose to begin providing care instead of relying on managed care. Secondary eldercare provision, however, remains unchanged in this group, as $\widehat{\gamma}$ is insignificant in both columns of Panel B.

Overall, the results indicate that the implementation of statewide, mandatory MLTSS programs (SMPs) significantly influences informal eldercare patterns, though these effects vary by both care type and household income. The most consistent impact is an increase in primary eldercare provision, particularly on the extensive margin, suggesting that more individuals begin providing care following SMP implementation. In contrast, secondary eldercare provision tends to decline, especially at the extensive margin, pointing to a potential shift in the nature of caregiving rather than a simple

reduction. Importantly, these changes are concentrated among middle- and higher-income households, who may have greater capacity to adjust their caregiving behavior in response to structural shifts in Medicaid service delivery. In contrast, lower-income households appear relatively unaffected, possibly due to limited flexibility in responding to structural changes in provision of Medicaid LTSS. These findings raise important questions for further research, particularly regarding the impact of MLTSS implementation on Medicaid take-up itself. Are individuals with higher-income caregivers opting out of Medicaid entirely, as hypothesized? The answer to this question would help bring about a better understanding of the relationship between MLTSS implementation and caregiving behavior.

6 Conclusion

This paper examines the impact of statewide, mandatory MLTSS (SMP) implementation on informal eldercare provision across household income levels. Using a difference-in-differences framework, I exploit variation in SMP rollout to estimate how its implementation affects both primary and secondary caregiving activities at the intensive and extensive margins. The results point to a nuanced set of outcomes: while primary eldercare increases significantly, particularly among middle- and higher-income households, secondary eldercare tends to decline or remain unchanged. These patterns suggest that the shift to managed care may prompt reallocation within informal care networks in addition to a substitution of formal for informal care.

Importantly, the effects of SMPs are heterogeneous across income groups. Lower-income households exhibit little to no response to the policy change, likely due to structural constraints such as limited financial flexibility, higher dependence on public programs, or reduced capacity to undertake caregiving roles within the household. In contrast, middle- and higher-income families are more likely to adjust their caregiving behavior following SMP rollout, with the most substantial increases in primary eldercare observed among these groups. One potential explanation for the observed phenomenon

is that for higher-income households, while the care recipient is eligible for MLTSS, they may be more inclined to opt out of these services due to concerns about service quality or limitations in provider availability under MCOs. As a result, these families may compensate by increasing their own informal caregiving. Thus, the implementation of mandatory MLTSS programs appears to prompt some families to substitute away from managed care services and toward family-provided informal care.

These findings have important implications for the ways in which Medicaid policy can be evaluated. While MLTSS implementation is often motivated by efforts to contain costs and improve care coordination, and thus evaluated using those metrics, such programs may inadvertently shift care burdens onto families, especially among those with greater capacity to begin providing informal care and risk the labor market consequences of doing so. These distributive and behavioral consequences are critical considerations as a growing number of states adopt MLTSS programs and evaluate their full economic and societal impacts. This study contributes to that broader understanding by offering preliminary insights into the relationship between MLTSS implementation and caregiving behavior.

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8 Appendix

Table 7: MLTSS Policy Transition Details, 2011-2019

State	2011	2012	2013	2014	2015	2016	2017	2018	2019
Alaska	0000	0000	0000	0000	0000	0000	0000	0000	0000
Alabama	0000	1111	1111	1111	1111	1111	1111	1111	1111
Arkansas	1211	1211	1211	1211	1211	1211	1211	1211	1211
Arizona	1221	1221	1221	1221	1221	1221	1221	1221	1221
California	1121	1121	1121	1121	1121	1121	1121	1121	1121
Colorado	1111	1111	1111	1111	1111	1111	1111	1111	1221
Connecticut	0000	0000	0000	0000	0000	0000	0000	0000	0000
DC	1221	1221	1221	1221	1221	1221	1221	1221	1221
Delaware	1221	1221	1221	1221	1221	1221	1221	1221	1221
Florida	1211	1211	1211	1221	1221	1221	1221	1221	1221
Georgia	1100	1100	1100	1100	1100	1100	1100	1100	1100
Hawaii	0000	0000	0000	0000	0000	0000	0000	0000	0000
Iowa	0000	0000	0000	0000	1220	1220	1221	1221	1221
Idaho	1220	1220	1220	1220	1101	1101	1101	1101	1101
Illinois	0000	0000	0000	0000	0000	0000	0000	1221	1221
Indiana	1201	1201	1111	1111	1111	1221	1221	1221	1221
Kansas	1111	1111	1221	1221	1221	1221	1221	1221	1221
Kentucky	1220	1220	1220	1220	1220	1220	1220	1220	1220
Louisiana	1101	1101	1201	1201	1201	1221	1221	1221	1221
Massachusetts	1221	1221	1221	1221	1221	1221	1221	1221	1221
Maryland	1221	1221	1221	1221	1221	1221	1221	1221	1221
Maine	1220	1220	1220	1220	1220	1220	1220	1220	1220
Michigan	1221	1221	1221	1221	1221	1221	1221	1221	1221

Continued on next page

Table 7 – continued from previous page

State	2011	2012	2013	2014	2015	2016	2017	2018	2019
Minnesota	1221	1221	1221	1221	1221	1221	1221	1221	1221
Missouri	1211	1211	1211	1211	1211	1211	1211	1211	1211
Mississippi	1201	1201	1201	1201	1201	1201	1201	1201	1201
Montana	1220	1220	1220	1220	1220	1220	1220	1220	1220
North Carolina	1111	1221	1221	1221	1221	1221	1221	1221	1221
North Dakota	1200	1200	1200	1200	1200	1200	1200	1200	1200
Nebraska	0000	0000	0000	1211	1211	1211	1221	1221	1221
New Hampshire	0000	0000	0000	1221	1221	1221	1221	1221	1221
New Jersey	1201	1201	1201	1201	1201	1201	1201	1201	1201
New Mexico	1101	1101	1101	1101	1101	1101	1101	1101	1221
Nevada	1220	1220	1220	1220	1220	1220	1220	1220	1220
New York	1221	1221	1221	1221	1221	1221	1221	1221	1221
Ohio	1221	1221	1221	1221	1221	1221	1221	1221	1221
Oklahoma	1111	1111	1111	1111	1111	1111	1111	1111	1111
Oregon	1211	1211	1211	1211	1211	1211	1211	1211	1211
Pennsylvania	1221	1221	1221	1221	1221	1221	1221	1221	1221
Rhode Island	1221	1221	1221	1221	1221	1221	1221	1221	1221
South Carolina	1221	1221	1221	1221	1221	1221	1221	1221	1221
South Dakota	1220	1220	1220	1220	1220	1220	1220	1220	1220
Tennessee	1111	1111	1111	1111	1111	1111	1111	1111	1111
Texas	1211	1221	1221	1221	1221	1221	1221	1221	1221
Utah	1201	1201	1201	1201	1201	1201	1201	1201	1201
Virginia	1101	1101	1101	1101	1101	1101	1101	1221	1221
Vermont	0000	0000	0000	0000	0000	1221	1221	1221	1221
Washington	1211	1211	1211	1211	1211	1211	1211	1211	1211

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Table 7 – continued from previous page

State	2011	2012	2013	2014	2015	2016	2017	2018	2019
Wisconsin	1221	1221	1221	1221	1221	1221	1221	1221	1221
West Virginia	1221	1221	1221	1221	1221	1221	1221	1221	1221
Wyoming	0000	0000	0000	0000	0000	0000	0000	0000	0000

0000: No program

1100: Non-statewide, non-mandatory program with HCBS not covered

1101: Non-statewide, non-mandatory program with HCBS covered

1110: Non-statewide, voluntary program with HCBS not covered

1111: Non-statewide, voluntary program with HCBS covered

1120: Non-statewide, mandatory program with HCBS not covered

1121: Non-statewide, mandatory program with HCBS covered

1200: Statewide, non-mandatory program with HCBS not covered

1201: Statewide, non-mandatory program with HCBS covered

1210: Statewide, voluntary program with HCBS not covered

1211: Statewide, voluntary program with HCBS covered

1220: Statewide, mandatory program with HCBS not covered

1221: Statewide, mandatory program with HCBS covered

Table 8: Count and Proportion of Respondents' Reported Eldercare Frequency

Frequency	**Count**	**Proportion**
Daily	3351	0.192897
Once a month	2053	0.118179
Once a week	3194	0.183859
Other	995	0.057276
Several times a month	3437	0.197847
Several times a week	4342	0.249942

Table 9: Mean Values of Outcome Variables (on the Intensive and Extensive Margins), Disaggregated by Year

YEAR	PRIMARY EC (minutes)	SECONDARY EC (minutes)	PRIMARY EC (%)	SECONDARY EC (%)
2011	30.22	47.91	28.84	24.39
2012	28.45	40.72	29.61	21.70
2013	29.20	45.91	30.02	23.61
2014	28.56	48.26	27.24	24.09
2015	29.41	42.39	28.51	24.18
2016	28.05	46.58	28.92	26.92
2017	30.15	52.69	27.33	25.94
2018	27.96	53.15	26.68	25.44
2019	25.62	52.06	25.60	27.16
Aggregate	28.70	47.45	28.18	24.70

Table 10: Mean Values of Outcome Variables (on the Intensive and Extensive Margins), Disaggregated by Region

REGION	PRIMARY EC (minutes)	SECONDARY EC (minutes)	PRIMARY EC (%)	SECONDARY EC (%)
Midwest	29.57104	39.19072	28.19185	22.35983
Northeast	30.99860	49.45807	28.72117	25.40182
South	27.72280	52.24685	27.50721	26.09619
West	27.56527	47.26452	29.01093	24.46809
Aggregate	28.70	47.45	28.18	24.70

Table 11: Mean Values of Outcome Variables (on the Intensive and Extensive Margins), Disaggregated by SMP Implementation Status, All Incomes

SMP Implementation Status	PRIMARY EC (minutes)	SECONDARY EC (minutes)	PRIMARY EC (%)	SECONDARY EC (%)
SMP not implemented	28.43	48.09	30.62	27.23
SMP implemented	28.93	46.99	30.42	27.17

Table 12: Mean Values of Outcome Variables (on the Intensive and Extensive Margins), Disaggregated by Household Income and SMP Implementation Status and Incomes

Family Income	SMP	Primary EC (minutes)	Secondary EC (minutes)	Primary EC (%)	Secondary EC (%)
Less than $35k	No	26.33	67.02	25.32	30.04
Less than $35k	Yes	25.99	57.70	24.13	28.77
$35k - $75k	No	25.75	46.67	25.99	24.78
$35k - $75k	Yes	26.31	48.61	26.57	25.95
$75k - $100k	No	32.07	42.63	30.44	22.35
$75k - $100k	Yes	27.47	39.71	29.68	22.58
Over $100k +	No	33.15	27.09	42.57	29.08
Over $100k +	Yes	37.73	33.88	43.51	29.15