Managed Care in Medicaid's Long-Term Services and Supports*

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Abstract

The American healthcare system and care economy face growing demands from an aging population, raising important questions regarding the organization, delivery, and funding for services in these two sectors. Long-term services and supports (LTSS) include medical and personal care services for individuals requiring assistance with daily activities. Over the last two decades, Medicaid—which pays for more than half of all LTSS delivery—has shifted away from traditional fee-for-service payment models toward managed care systems in which private insurers cover LTSS in exchange for capitated payments from the government. We study the effects of the transition to managed LTSS (MLTSS) in Florida's and New York's Medicaid programs on healthcare utilization and outcomes among dual-eligible Medicare-Medicaid beneficiaries aged 65 and older. Using administrative Medicare claims data, we leverage the county-by-county rollouts of MLTSS mandates in the two states in a stacked difference-in-differences design. We first find that, following the shift to MLTSS, Medicare beneficiaries are less likely to enroll in full dual benefits that encompass Medicaid coverage of LTSS. We next find that among individuals who are continuously enrolled in full dual benefits, MLTSS leads to a reduction in preventive care, including evaluation & management visits with primary care providers and influenza vaccines. Moreover, in Florida, we observe an increase in emergent hospitalizations as well as hospitalizations with an influenza diagnosis, while finding a reduction in outpatient emergency department care. We do not find strong evidence of significant impacts on mortality in either state. Importantly, the healthcare utilization outcomes that we study are all covered by Medicare, and therefore the effects we find can be interpreted as spillovers of MLTSS on care not included under the managed care model. In ongoing work, we examine the impacts of MLTSS on Medicare spending to better understand the fiscal implications of the shift toward managed care in Medicaid's administration of LTSS.

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1 Introduction

More than one in five Americans will be aged 65 or older by 2030 (Vespa et al., 2020). Driven by increasing life expectancy and a declining fertility rate, an aging population has widespread implications on many dimensions, including economic productivity and the sustainability of major public programs such as Social Security and Medicare. It also places increasing demands on the healthcare system and the care economy, raising important questions about how to organize, deliver, and pay for services in these two sectors.

This paper studies these issues in the context of the provision of long-term services and supports (LTSS). LTSS includes a broad spectrum of personal care and medical services, such as assistance with daily living activities (e.g., eating, bathing, dressing), physical, occupational, and speech therapy, and in some cases dental care, optometry, and podiatry, and can be delivered in nursing homes, community-based (e.g., adult day care), or home-based settings. In 2022, total spending on LTSS in the United States amounted to $415 billion, more than half of which was paid by Medicaid, the largest public insurance program for low-income and disabled individuals (Chidambaram and Burns, 2024). Therefore, understanding how Medicaid's administration of LTSS impacts healthcare utilization, outcomes, and costs is critical for identifying best practices in serving a rapidly aging American population.

The majority of Medicaid beneficiaries—72 million people in 2022—are enrolled in managed care plans that assume patients' financial risks in exchange for capitated payments from the government, reflecting a major shift from prior delivery models in which states reimbursed healthcare providers directly on a fee-for-service (FFS) basis (Gruber, 2017; Hinton and Raphael, 2025).[1] Advocates of managed care systems argue that they curb health care costs and improve care coordination.[2] However, empirical evidence on the effects of Medicaid managed care on costs and patient health outcomes is mixed and focuses on relatively young and healthy populations (Cutler et al., 2000; Duggan, 2004; Howell et al., 2004; Currie and Fahr, 2005; Aizer et al., 2007; Herring and Adams, 2011; Duggan and Hayford, 2013; Kuziemko et al., 2018; Chorniy et al., 2018; Duggan et al., 2018; Brown et al., 2014; Cabral et al., 2018; Curto et al., 2019; Duggan et al., 2018).

Moreover, LTSS patients had been largely excluded from Medicaid managed care models until re-

[1] In Medicare, 54 percent of enrollees are on private "Medicare Advantage" (MA) plans (Freed et al., 2024).

[2] See https://medicaiddirectors.org/resource/understanding-managed-care/ for discussion about some of the motivations behind managed care in Medicaid.

cently. Only eight state Medicaid programs offered managed care to LTSS patients in 2004, whereas 24 states did by the end of 2023 (Lewis et al., 2018; Dobson et al., 2021; Stockdale et al., 2024). Compared to the FFS model, the potential advantages of managed long-term services and supports (MLTSS) include more predictable (and possibly lower) costs to the state, greater coordination and efficiency in the delivery of different types of care, and a shift away from nursing home care toward home-based and community-based services (Lewis et al., 2018; Tuck and Moore, 2019). However, from the patients' perspective, access to a more limited network of providers included in an MLTSS plan than they would have under FFS may be a downside. Moreover, surveys indicate that beneficiaries on MLTSS plans have lower rates of satisfaction and perceive a shift away from a "patient-centered approach" of healthcare delivery (Salehian et al., 2022; American Council on Aging, 2025). To date, there is limited causal empirical evidence regarding the impacts of the shift to MLTSS in Medicaid on the healthcare utilization and health outcomes of patients.

This paper studies the impacts of the transition from FFS to managed care in LTSS among individuals who are dual-eligible for Medicaid and Medicare and aged 65 and above.[3] For dual-eligible beneficiaries, the Medicaid program pays for LTSS, while the Medicare program is the primary payer for other types of healthcare services, including hospitalizations, office visits with primary care providers (PCPs) and specialists, and emergency department (ED) visits.[4] Recent estimates suggest that people using Medicaid LTSS constitute about six percent of overall Medicaid enrollment, but account for 37 percent of federal and state spending on the program (Chidambaram and Burns, 2023).

We focus on the county-by-county transitions to Medicaid MLTSS in New York and Florida, which occurred over 2012–2015. We employ a stacked differences-in-differences (DD) design (Cengiz et al., 2019; Deshpande and Li, 2019; Butters et al., 2022; Wing et al., 2024) in which we compare changes in outcomes among beneficiaries in treated New York and Florida counties to those among beneficiaries in never-treated counties in two control states—Pennsylvania and California—over the same time period. We use administrative claims data for beneficiaries enrolled in traditional FFS Medicare to study care in outpatient, inpatient, and ED settings, as well as mortality. Since these care utilization outcomes are not covered by Medicaid, any changes in them can be understood as spillovers of the managed care model in Medicaid LTSS on other types of healthcare *not included* under that model.

We first show that the transition to MLTSS reduces the likelihood that a Medicare beneficiary is en-

[3]Individuals are dual-eligible for Medicaid and Medicare if their household income falls below their state's eligibility threshold and/or if they are eligible for Supplemental Security Income, or SSI.

[4]Medicaid also pays for cost-sharing for Medicare-covered services for dual-eligible beneficiaries.

rolled in full dual benefits that include Medicaid coverage of LTSS.[5] This effect might reflect patients' desire to retain broader provider networks, which they can do if they opt out of full dual benefits and instead use private coverage or self-pay for LTSS. Related, patients may want to avoid frictions related to switching plans, which have been documented in other Medicaid MLTSS programs.[6] Prior work also finds that dual-eligible patients experience barriers to finding providers who will accept Medicaid (Li, 2023), and this may be particularly costly for patients needing LTSS under the managed care model.

To account for potential compositional bias due to this attrition from full dual benefits, our analysis of healthcare utilization outcomes uses a balanced panel of Medicare beneficiaries who are continuously enrolled in full dual benefits for a window of time from before to after the MLTSS mandate goes into effect and controls for individual fixed effects.[7] We find that, for these beneficiaries, the shift to MLTSS reduces use of preventive care, including evaluation & management (E&M) visits with PCPs and influenza vaccinations. Specifically, we find a 2.2 percentage point (7.4 percent relative to the pre-treatment mean) decrease in the likelihood of an E&M visit in Florida in the four quarters following the mandate, and a 0.6 percentage point (1.5 percent relative to the pre-treatment mean) reduction in the likelihood of such a visit in New York. We additionally find a 1.8 percentage point (12.0 percent) reduction in the likelihood of receiving a vaccine against influenza in the four years following the mandate in Florida. The coefficient for this outcome in New York is similarly negative, but not statistically significant.

The decline in preventive care may be a signal of a perception—by either patients or providers or both—that LTSS administered through the managed care model is a substitute for office-based preventive check-ups with PCPs. That said, even if a flu vaccine were to be administered in a nursing home or as part of community-based LTSS, it would be observed in the Medicare claims data since it is covered by Medicare Part B.[8] Thus, the decline in flu vaccines that we find reflects an overall decrease in the use of this preventive service, rather than a substitution from office-based to LTSS-based care.

Correspondingly, in Florida, emergent hospitalizations increase by 0.2 percentage points (4.1 per-

[5] Beneficiaries can also be enrolled in partial dual benefits, which only cover patient cost-sharing for services paid by Medicare, but do not cover LTSS. We observe an increase in the likelihood of enrollment in partial dual benefits.

[6] Salehian et al. (2022) conduct a survey of beneficiaries enrolled in Medicaid MLTSS in Virginia, finding that a substantial share of patients are interested in changing plans but are not able to, and that this barrier is associated with lower patient satisfaction.

[7] For most outcomes, we consider a window of four quarters before, quarter of, and through four quarters after the MLTSS mandate goes into effect. For outcomes that have an annual frequency, such as influenza vaccination, we use a period of three years before to four years after the mandate.

[8] See: https://www.cms.gov/flu-provider.

cent) in the following four quarters, while hospitalizations with an influenza diagnosis rise by 0.07 percentage points (100 percent) in the four subsequent years. In New York, we find a marginally significant 0.05 percentage point (83 percent) increase in influenza-related hospitalizations over the same follow-up window.

We also consider four categories of ED visits: (a) emergent, needed and not preventable, (b) emergent, needed and preventable, (c) emergent and primary care treatable, and (d) non-emergent.[9] In Florida, we find that MLTSS leads to a reduction of 0.2 percentage points (5.5 percent), 0.07 percentage points (2.7 percent), 0.3 percentage points (5.3 percent), and 0.2 percentage points (5.1 percent), respectively, in the probability of ED visits in each of the four categories. Additional analyses indicate that these reductions are driven by ED visits that do not lead to hospitalization. Paired with the increase in emergent hospitalizations discussed above, this pattern suggests that Medicaid's MLTSS may be effective at reducing the need for urgent (but relatively mild) care, but increases the probability of more severe health issues that require inpatient care. We do not find any significant effects on ED visits in New York.

We next use the linkage between the Medicare files and the Minimum Data Set for nursing homes to study the incidence of nursing home assessments as a proxy for any care in a nursing home. We find no significant change in the likelihood of receiving a nursing home assessment in Florida in the four quarters following the transition to MLTSS, suggesting that there is no major shift away from nursing home care and toward home- or community-based care. In New York, there is a 0.4 percentage point (3.2 percent) decline in the likelihood of any nursing home assessment, but this effect appears to reflect a continuation of a pre-existing trend.

Finally, we examine the impacts of the transition to MLTSS on patient mortality. We calculate county$\times$year mortality rates, using two different denominators: all Medicare enrollees aged 65 and above, and all Medicare beneficiaries aged 65 and above who are enrolled in full- or partial- dual benefits. We do not condition on enrollment in only full-dual benefits, since we observe differential selection out of this sample, as discussed above. Across the two measures and the two states, we do not find any indication of a significant reduction in mortality following the implementation of MLTSS. If anything, the mortality rate in New York appears to increase by 0.3 percentage points (2.4 percent) when we use the second measure. But given the inconsistency across the two measures, this result should be interpreted with caution.

[9] These categories are developed by the New York University Center for Health and Public Service Research. See: https://wagner.nyu.edu/faculty/billings/nyued-background.

One important limitation of our analysis is that we do not directly observe which beneficiaries are functionally eligible to use long-term services and supports, and therefore directly affected by the shift to MLTSS. Thus, the magnitudes of the effects that we find should be interpreted as intent-to-treat (ITT) estimates, as our sample also includes individuals who are not impacted by the policy we study. To address this issue, we also report estimates for the sub-group of beneficiaries who have a pre-existing Alzheimer's diagnosis, as they are particularly likely to be LTSS-eligible. For most of our outcomes, the effects for this sub-group are not statistically different from the effects in the overall sample in each state. That said, it appears that while the overall effects on hospitalizations and ED visits are not statistically significant in New York, patients with Alzheimer's exhibit significant increases in both. Additionally, in contrast to what we find for the overall sample, we observe a decline in nursing home assessments in Florida, and a marginally significant increase in New York.

These differences in effects on nursing home care between New York and Florida could reflect differences in payment models between MLTSS systems in the two states. In particular, in New York, capitation payments from the state to MLTSS plans are risk-adjusted, using an algorithm that includes 26 predictor variables, one of which is an indicator for an Alzheimer's or dementia diagnosis. Put differently, New York Medicaid's payments to MLTSS plans are adjusted upward to account for additional services needed in this population. By contrast, capitation payments are not risk-adjusted for any specific conditions in Florida, although they do penalize plans for having too high of a share of patients in nursing homes relative to home-based and community-based settings. Therefore, relative to New York, Florida's MLTSS plans may have a stronger incentive to shift the costlier Alzheimer's patients out of nursing home care.

We also analyze heterogeneous impacts by patients' race/ethnicity. This analysis is motivated by the concern that capitation payment models generate financial incentives for insurers to "cream-skim," i.e., to avoid or provide lower-quality care to higher-cost patients (Newhouse, 1996). This could lead to racially disparate care and outcomes due to large differences in patients' expected healthcare costs across different racial groups. That is, capitation payments—which are typically based on average prior costs in a local area—are likely to under-pay for patients in racial groups with higher than average healthcare needs, while over-paying for those in racial groups with lower than average healthcare needs. Consistent with this conjecture, prior research on pregnant women, infants, and children finds evidence of a deterioration in care and outcomes among Black patients—who have disproportionately higher costs associated with outcomes during pregnancy, in infancy, and during childhood—

under managed care models relative to FFS (Kuziemko et al., 2018; Currie and Fahr, 2005).[10] In our setting, we do not find clear patterns of differences in effects across patients from different racial and ethnic groups. This may be due to the fact that we study an older population, in which differences in expected healthcare costs by race/ethnicity are dominated by differences in average age and life expectancy. That is, although in general, Black patients tend to experience worse health outcomes than non-Hispanic white patients, they are also on average younger and have shorter expected life spans within an aging population (Dwyer-Lindgren et al., 2022). Therefore, the racially disparate incentives on healthcare provision under capitation may be less pronounced among LTSS patients than among other populations, like pregnant women and children.

Our paper makes several contributions to the existing literature. We build on a large body of work that compares patient health outcomes and healthcare costs between fee-for-service (FFS) and capitated managed care models in various health insurance programs (Cutler et al., 2000; Duggan, 2004; Howell et al., 2004; Currie and Fahr, 2005; Aizer et al., 2007; Herring and Adams, 2011; Duggan and Hayford, 2013; Brown et al., 2014; Cabral et al., 2018; Kuziemko et al., 2018; Chorniy et al., 2018; Duggan et al., 2018; Curto et al., 2019; Lee and Vabson, 2024). Two recent studies have analyzed the effects of transitions from FFS to Medicaid managed care on disabled and elderly patients. Layton et al. (2022) find increased use of outpatient services and higher costs in Texas, while Duggan et al. (2021) find an increase in emergency department visits and mortality. However, these studies do not consider the effects of managed care in LTSS on healthcare utilization that is not under the same model. Our findings of decreases in the use of preventive care, combined with increases in emergent hospitalizations, and mixed evidence on ED visits—all services that are paid by Medicare—underscore the possibility of fiscal spillovers of Medicaid's MLTSS on spending in another public program. Ongoing analysis is directly analyzing the effects of the transition to MLTSS on Medicare FFS costs.

The most closely related study is by Bhaumik et al. (2025), who use a DD design to measure the impacts of state Medicaid programs transitioning to MLTSS on survey respondents in the Health & Retirement Study aged 65+ who report having at least one functional limitation. They find that the shift to MLTSS increases the use of home-based care services, decreases the use of informal care, and

[10] Risk-adjustment algorithms are intended to reduce the scope of "cream-skimming" behavior, but studies show that insurers still "cream-skim" using characteristics that are excluded from the model (Brown et al., 2014; Rose et al., 2017; Bergquist et al., 2019; Zink and Rose, 2020; McGuire et al., 2021). Race is excluded from New York's risk-adjustment algorithm, which relies on prior interactions with the healthcare system and therefore could exhibit racial bias as in Obermeyer et al. (2019).

has no impact on nursing home care, hospitalizations, or the incidence of falls.[11] We build on this study in several ways. First, we use administrative Medicare claims data, allowing us to comprehensively track healthcare utilization and outcomes, including mortality. Second, we measure treatment at the county level rather than the state level, which reduces measurement error in the analysis,[12] and allows us to study heterogeneity in impacts across two states with different program features. Third, our larger sample sizes permit for a more thorough examination of heterogeneous treatment effects, including by race/ethnicity and by whether or not an individual has an Alzheimer's diagnosis.

The paper proceeds as follows. Section 2 describes the institutional details related to MLTSS in Medicaid in Florida and New York. Section 3 describes our data sources, while Section 4 outlines our empirical strategy. Section 5 presents the results, while Section 6 offers discussion and conclusions.

2 Background

Long-term services and supports (LTSS). Long-term services and supports refer to a broad set of medical and personal care services, including assistance with eating, preparing meals, bathing, dressing, managing medications, and housekeeping, as well as occupational and physical therapy and in some circumstances dental care, optometry, and podiatry. These services can be delivered in nursing homes, community-based, or home-based settings, and are provided by different healthcare professionals, including nurses, nursing aides, and home health aides. According to most recent estimates, more than 8 million Americans use paid LTSS with total costs amounting to $415 billion, while an unknown (but likely even larger) number use unpaid care services provided by family members, friends, or neighbors (Chidambaram and Burns, 2024).

LTSS under Medicaid. Medicaid pays for over 60 percent of all spending on LTSS, making it the primary insurance program for these services. While in the last three decades, state Medicaid programs have transitioned over three-quarters of all enrollees to capitated managed care plans (Hinton and Raphael, 2025), LTSS patients have only begun to be affected by this change in more recent years (Hinton et al., 2022).

Under Medicaid managed care systems, states pay private insurers a fixed fee per month per enrollee (i.e., a capitation payment) for providing the Medicaid benefits specified in their contracts. The

[11] Other analyses of Medicaid MLTSS have included a descriptive reports by Mathematica Policy Research (Libersky et al., 2018) and the Government Accountability Office (Office, 2020), a DD evaluation of nursing home outcomes (Potter and Bowblis, 2021), and a pre-post evaluation of Virginia's Medicaid MLTC transition using Medicaid data (Mellor et al., 2024).

[12] For example, Bhaumik et al. (2025) use 2013 as Florida's year of treatment, whereas we can analyze the quarterly evolution of outcomes in Florida as different counties switched to MLTSS between August 2013 and March 2014.

plans, which are sometimes referred to as managed care organizations (MCOs), in turn, establish networks of providers and develop other coordination and gatekeeping mechanisms that aim to reduce costs and improve the efficiency of care delivery.

To develop the capitation payments, states use recent data to determine the baseline cost of providing the contracted services to enrollees (MACPAC, 2022). The baseline is then adjusted for subgroups of enrolled populations. In the early 2000s, most states relied solely on basic demographic factors to adjust their capitation payments (Courtot et al., 2012). Today, more sophisticated risk-adjustment models are sometimes used to better reflect enrollee health status and expected costs of care, but there is a significant amount of variation in the use of risk adjustment across states.

New York Medicaid's MLTSS. New York's Medicaid program mandated enrollment in managed LTSS plans (in New York, they are called managed long-term care, or MLTC, plans) on a staggered basis across different counties from 2012 through 2015. The mandate was specific to people who are dual-eligible for Medicaid and Medicare, aged 21 or older, and are in need of community-based LTSS for more than 120 days based on an assessment.[13]

Appendix Figure A1 plots the trends in the number of dual-eligible beneficiaries (with full dual benefits) who are enrolled in an MLTC plan in three groups of New York counties, based on the timing of their mandate: September 2012 in sub-figure (a), May 2013 in sub-figure (b), and September 2013 in sub-figure (c).[14] We see evidence of increases in enrollment in the months leading up to the mandates, which is consistent with the fact that beneficiaries were able to voluntarily enroll prior to them going into effect. However, following each of the mandates, there is a clear change in the rate of the increase, as evidenced by the steeper slope of the trend line.[15]

New York's MLTC plans receive a capitation payment from the state Medicaid program based on

[13] An initial assessment is conducted by the plan within 30 days of referral. Then, the plans are required to conduct routine assessments every six months. Note, the mandate does not exclude nursing home residents if they qualify for community-based LTSS as well.

[14] We use Medicaid Analytic eXtract (MAX) data to document these trends. Our data reuse agreement allows us to use 2008–2013 MAX data files, so we are only able to show trends in MLTSS plan enrollment over this time period. We are unable to analogously plot trends in MLTSS plan enrollment in Florida due to poor data quality. Over 86 percent of beneficiaries who ever have full dual status in 2013 in Florida have missing plan information.

[15] In principle, beneficiaries also have an option to voluntarily enroll in a plan that covers all other healthcare services in addition to LTSS. Plans that cover full healthcare services are called Medicaid Advantage Plus (MAP) and the Program of All-Inclusive Care for the Elderly (PACE). As of December 2019, at the end of our data period, there were 7 MAP plans, 9 PACE plans, and 26 MLTC plans operating in New York. However, in practice, most enrollees in New York chose a plan that only covers LTSS. For instance, in December 2019, 250,743 (or 91.5%) MLTSS enrollees were in MLTC plans, compared to 17,620 (6.4%) in MAP and 5,734 (2%) in PACE plans (NYDOH, n.d.). As a result, most dual-eligible LTSS patients in New York receive their long-term care services through an MLTC plan, while Medicare covers all of their other primary and acute care services in office-based, outpatient, inpatient, and ED settings.

a risk-adjustment algorithm, which incorporates 26 predictor variables, including age, sex, and some selected diagnoses, including an indicator for an Alzheimer's or dementia diagnosis (Hinton et al., 2016).

Florida Medicaid's MLTSS. Florida's Medicaid program implemented its mandatory managed LTSS program for eligible beneficiaries across its counties between 2013 and 2014. To qualify, individuals must be aged 65 or older and eligible for Medicaid (or aged 18 or older and eligible for Medicaid due to a disability) and functionally eligible based on a state assessment.

Florida Medicaid's MLTSS plans receive capitation payments based on the proportion of enrollees in home- and community-based settings relative to nursing facilities. Specifically, plans are directly incentivized to facilitate the transition of enrollees to home- and community-based care (and out of nursing home care): the base capitation rate is adjusted by a transition percentage, penalizing plans for the share of nursing home enrollees until this share falls below 35 percent. Unlike New York, Florida does not further adjust rates based on patient conditions or other demographic characteristics. We present a more detailed comparison of the MLTSS programs in Florida and New York in Appendix Table A1.

Control states. We use counties in Pennsylvania and California as controls in our analysis of the MLTSS transitions in New York and Florida, respectively. We chose Pennsylvania as the control state for New York due to its geographic proximity and similar population size. Additionally, publicly available data on Medicare enrollment trends suggest that Pennsylvania exhibited trends similar to those of New York over our analysis period. Likewise, for Florida, we chose California as the control state based on similar Medicare enrollment trends and a comparable population size. See Appendix Figure A2 for Medicare enrollment trends in these states between 2013 and 2019.

Pennsylvania's Medicaid program only began implementing managed LTSS in 2018; thus, all 67 of Pennsylvania's counties are never-treated during the analysis period used to study the impacts of New York Medicaid's MLTSS. In California's Medicaid program, seven counties implemented MLTSS during our sample period.[16] We use the remaining 51 never-treated counties as controls for treated Florida counties.

[16]These counties are Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Mateo, and Santa Clara.

3 Data

We use administrative Medicare enrollment and FFS claims data for years 2008–2019 from the Centers for Medicare and Medicaid Services (CMS). Our data reuse agreement permits the use of data from four states: California, Florida, New York, and Pennsylvania.[17]

For each individual enrolled in traditional Medicare, we observe their demographic characteristics (age, race/ethnicity), county of residence, enrollment status, and date of death (if applicable), as well as all of their hospital inpatient, hospital ED, and hospital outpatient claims which can be linked using their unique beneficiary identifiers. Additionally, for a random 20 percent sample of beneficiaries, we can link to their carrier files, which contain FFS claims submitted by non-institutional providers including physicians, laboratories, and ambulance services.[18] Finally, we use a linkage to the Minimum Data Set (MDS), which contains information on nursing home assessments, to capture nursing home care utilization.

Identifying dual-eligible beneficiaries. Only beneficiaries who are enrolled in full dual benefits have LTSS covered by Medicaid, and therefore are affected by the transition to MLTSS. To identify full dual beneficiaries, we follow recommendations from the CMS Research Data Assistance Center (RESDAC), and categorize a beneficiary as having full dual benefits if they have a dual status code of "02," "04," or "08".[19] We consider a beneficiary to be a full dual if they have full dual status in at least one month in a calendar quarter. Analogously, we identify beneficiaries enrolled in partial dual benefits, for whom Medicaid pays for cost-sharing through the Medicare Savings Program but does not cover LTSS, as those with a dual status code of "01," "03," "05," or "06".[20]

Outcomes. We consider multiple measures of healthcare utilization. To study utilization of primary and preventive care services, we use the carrier files and identify new and established evaluation & management (E&M) office visits using the Berenson-Eggers Type of Service (BETOS) codes "M1A" and "M1B," respectively. Further, we use the CMS provider specialty codes "01" (General practice),

[17] CMS did not allow us to use data from any other states for this project.

[18] The Medicare carrier files were previously known as Physician/Supplier Part B claims files.

[19] The codes are defined as follows: "02"—QMB and full Medicaid coverage, including prescription drugs; "04"—SLMB and full Medicaid coverage, including prescription drugs; "08"—Other dual eligible (not QMB, SLMB, QWDI, or QI) with full Medicaid coverage, including prescription drugs (Centers for Medicare & Medicaid Services, 2021).

[20] The codes are defined as follows: "01"—QMB only (qualified Medicare beneficiaries; Medicaid pays Part A and B premiums); "03"—SLMB only (Specified Low-Income Medicare Beneficiaries; Medicaid pays Part B premium); "05"—QDWI (Qualified Disabled and Working Individuals; Medicaid purchases Part A benefits, but no Medicaid benefits); "06"—Qualifying individuals (QI; Medicaid pays Part B premium, but no Medicaid benefits).

"08" (Family practice), "11" (Internal medicine), and "84" (Preventative medicine) to categorize E&M visits that occur with a primary care physician (PCP). To identify influenza immunizations in the carrier files, we use BETOS code "O1G." We create binary indicators capturing whether a beneficiary had any E&M visit with a PCP and whether they had an influenza vaccination.

Additionally, we study hospitalizations and ED visits in the claims files. To classify the type of admission, we use the "inpatient admission type code" included in the inpatient claims. "Emergent" hospitalizations are described as those in which "the patient required immediate medical intervention as a result of severe, life threatening, or potentially disabling conditions" (ResDAC, n.d.). These patients are generally admitted through the emergency department (ResDAC, n.d.). We categorize a hospitalization as having a diagnosis of influenza using ICD-9 (487) and ICD-10 (J09-J18) codes.

For ED visits, we use both inpatient and outpatient files with revenue center codes "0450", "0451", "0452", "0453", "0454", "0455", "0456", "0457", "0458", "0459", and "0981". To further categorize ED visits by their necessity and severity, we use the algorithm developed by the New York University Center for Health and Public Service Research (Billings et al., 2000).

In addition, we observe nursing home assessments from the Minimum Data Set (MDS) version 3.0. The MDS contains assessment records for all residents regardless of payer in Medicaid- and Medicare-certified nursing homes. These assessments occur upon admission, periodically, and upon discharge. We use an indicator for having any assessment record in this file to measure nursing home utilization.

Finally, we observe mortality in the Medicare Master Beneficiary Summary File (MBSF), which provides information on the date of death.

4 Empirical Design

While there is geographic and temporal variation in the timing of MLTSS mandates in both New York and Florida, an important empirical challenge is that these mandates occurred over a relatively short time period. As outlined in Appendix Table A2, all 67 Florida counties transitioned to MLTSS between August 2013 and March 2014, and all 62 New York counties did so between September 2012 and February 2015.

To address this challenge, we use a stacked difference-in-differences (DD) design, which allows for a comparison of outcomes between individuals in treated counties and individuals in never-treated counties in separate "experiments" that we stack together for estimation. Specifically, we construct an

experiment for each treatment period. Within each experiment, the treatment group consists of all full dual beneficiaries who reside in a treated county and are aged 65 or older as of four quarters before the transition to MLTSS, and the control group consists of all full dual beneficiaries who reside in a never-treated county and are aged 65 or older as of four quarters before the time of the treatment group's MLTSS transition. Since counties in Florida transitioned to MLTSS over three calendar quarters, we create three separate experiments to reflect these three treatment periods. Analogously, since counties in New York transitioned to MLTSS over nine calendar quarters, we create nine experiments that we stack together for estimation in our analysis of New York's transition to MLTSS.

To measure the impacts of the transition to MLTSS on healthcare utilization outcomes, we use our stacked dataset and estimate the following model:

$$Y_{ictk} = \alpha + \beta MLTSS_{ctk} + \delta_{ik} + \gamma_{tk} + \zeta' X_{itk} + \epsilon_{ictk} \tag{1}$$

for beneficiary i in county c observed in year-by-quarter t and in experiment k. Y_{ictk} is an outcome of interest, such as a binary indicator for whether a beneficiary had an E&M Visit with a PCP. $MLTSS_{ctk}$ is a binary indicator equal to 1 for treated counties in all year-quarters once the MLTSS mandate is in effect, and 0 otherwise. δ_{ik} are individual-by-experiment fixed effects, which account for all (observable and unobservable) time-invariant differences across individuals within each experiment, while γ_{tk} are experiment-by-quarter fixed effects, which account for any time trends in outcomes within each experiment. For many of our outcomes, we restrict our analysis to a one-year window that spans 4 quarters before the mandate, the quarter of the mandate, and 4 quarters after the mandate. We drop individuals who move counties at any point during this window,[21] and we require individuals to be continuously enrolled in full dual benefits throughout the event window. Standard errors are clustered on the county-by-experiment level.

Our main coefficient of interest, β, captures the difference between the change in the outcome in treated counties from before and after the MLTSS mandate, relative to the change in the outcome in the control counties over the same time period within the experiment. We estimate separate models to study the effects of New York Medicaid's MLTSS transition (with Pennsylvania counties as the never-treated controls) and the effects of Florida Medicaid's MLTSS transition (with California counties as the never-treated controls).

[21] Since we drop movers, we do not include county fixed effects, as they are subsumed by the individual-by-experiment fixed effects.

The key identifying assumption for a causal interpretation of β in equation (1) is that, in the absence of an MLTSS mandate, outcome trends would have evolved similarly between beneficiaries in treated and control counties within an experiment. While this assumption is inherently untestable, we estimate event-study models with indicators for year-quarters relative to the time of the mandate that allow us to check for systematic differences in pre-treatment trends between treated and control groups. Specifically, for beneficiary i in county c observed in year-by-quarter t and in experiment k, we model outcome Y_{ictk} as:

$$Y_{ictk} = \alpha + \sum_{j=-4, j\neq -1}^{j=4} \beta_j \mathbf{1}[t - MLTSS_{ctk} = j] + \delta_{ik} + \gamma_{tk} + \zeta' X_{itk} + \epsilon_{ictk} \tag{2}$$

The variables in equation (2) are the same as in equation (1), except that we now include indicators $\mathbf{1}[t - MLTSS_{ctk} = j]$ to capture event-time indicators for the four quarters before, quarter of, and four quarters following the mandate, with event-time -1 as the omitted category. This model additionally allows us to explore dynamic treatment effects over time.

Annual outcomes. While we analyze many of our outcomes on a quarterly basis, utilization of some services is likely to only occur once a year. This is particularly true for flu vaccinations, which the Centers for Disease Control & Prevention (CDC) recommends that people get annually (ideally in early fall).[22] Therefore, we measure the impacts of MLTSS mandates on the incidence of flu vaccination and, correspondingly, hospitalizations due to influenza, on an annual basis. Similarly, when studying enrollment in full dual and partial dual benefits as outcomes, we also use an annual measure. Specifically, we use an event window that spans three years before the mandate, the year of the mandate, and three years after the mandate. We then estimate a version of our stacked DD models for a beneficiary i in county c in year t in experiment k, with experiment-by-individual and experiment-by-year fixed effects.[23] For the analysis of flu vaccinations and hospitalizations, we require that beneficiaries are enrolled in full dual benefits during the entire event window, and are aged 65 or older as of three years before the mandate (i.e., at $t-3$). For the analysis of enrollment in dual benefits, we only use the age restriction (i.e., we include all Medicare beneficiaries who are aged 65 or older as of three years before the mandate).

[22] See: https://www.cdc.gov/flu/vaccines/vaccinations.html.

[23] For concreteness, our annual analysis of Florida thus consists of 2 experiments to account for the two treatment years of 2013 and 2014. The counties in the 2013 experiment include 33 treated FL counties and 51 never-treated CA counties. The counties in the 2014 FL experiment include 34 treated FL counties and 51 never-treated CA counties. Our annual analysis of New York consists of 4 experiments that correspond to counties that were treated in 2012, 2013, 2014, and 2015.

Mortality. To study the impacts of MLTSS mandates on mortality, we collapse our data to the county $\times$year level and construct two measures that each have methodological advantages and disadvantages. Our first measure calculates the share of beneficiaries who die out of all Medicare beneficiaries who are aged 65 or older and alive at the beginning of the year in each county$\times$year cell. The advantage of this measure is that the denominator includes all Medicare beneficiaries, regardless of dual status, which means that it is unaffected by any compositional changes due to selection out of full dual benefits following the shift to MLTSS. The disadvantage is that full-benefit dual-eligible beneficiaries only comprise a small percentage of the entire Medicare population, making it harder to detect potential effects on their mortality rates. Our second measure focuses on deaths among the dual-eligible population, but includes both full-dual and partial-dual enrollees. Specifically, we calculate the share of beneficiaries who die in a given year out of all Medicare beneficiaries who are aged 65+, alive in the beginning of the year, and enrolled in partial- or full-dual benefits. While this measure allows us to more precisely capture mortality among the affected population, the disadvantage is that it could be biased due to changes in the denominator. While we show that most of the selection out of full dual benefits results in enrollment in partial dual benefits, it is still possible that there are broader compositional changes in the combined (full and partial) dual population.

For the mortality analyses, we estimate a version of our stacked DD model for a county c in year t and experiment k, with experiment-by-county and experiment-by-year fixed effects. We include time-varying demographic controls (percent female, percent aged 65-74, percent aged 75-84, and percent aged 85+) and weight our regressions by the 2010 county population from the U.S. Census Bureau.

Summary statistics. Table 1 presents the means of selected characteristics of the individuals in our analytic sample, observed in the quarter before the transition to MLTSS in each experiment. We use our main analytic sample of beneficiaries with full dual benefits, who are aged 65 or older as of four quarters before the transition to MLTSS, and are continuously enrolled in full dual benefits over an event window that spans four quarters before the transition to MLTSS, the quarter of the transition to MLTSS, and four quarters after the transition to MLTSS. In this sample, we have 173,002 beneficiaries in Florida, 252,644 individuals in California, 319,123 individuals in New York, and 168,291 individuals in Pennsylvania.

Column (1) presents the means for individuals who reside in Florida, and column (2) presents the means for individuals who reside in the 51 never-treated counties in California (our control state for

Florida). Analogously, column (3) presents the means for individuals who reside in New York, and column (4) presents the means for individuals who reside in Pennsylvania (our control state for New York). Overall, 63–71 percent of the sample is female, and 16–22 percent of the sample is over the age of 85 in the quarter before the transition to MLTSS. The racial composition of our sample varies more substantially across the four states, ranging from 42–71 percent non-Hispanic white, 7–20 percent non-Hispanic Black, and 3–35 percent Hispanic. The bottom panel of Table 1 presents the means of selected chronic conditions. In our sample, 88–93 percent of individuals have a diagnosis for at least one chronic condition in the quarter before the transition to MLTSS, and 7–19 percent of the sample has an Alzheimer's diagnosis by the quarter before the transition to MLTSS.

5 Results

We begin by presenting our results on the impacts of MLTSS on the likelihood of enrollment in dual benefits. We then describe our results on healthcare utilization outcomes, including PCP visits, flu vaccinations, hospitalizations, and ED visits. Next, we discuss our findings on nursing home use, and then we present our results on mortality rates. Lastly, we discuss results from heterogeneity analyses, including for the sub-group of patients with a pre-existing Alzheimer's diagnosis and by patient race/ethnicity. Throughout, we separately present results for Florida and New York.

5.1 Dual status

Figure 1 presents the event-study estimates from regression models that use as outcomes binary indicators for being enrolled in full-dual and partial-dual benefits in sub-figures (a)-(b) and (c)-(d), respectively. As previously discussed, only beneficiaries who are enrolled in full-dual benefits are eligible to have Medicaid coverage of LTSS.

Figure 1(a) shows that the likelihood of being enrolled in full-dual benefits decreases in Florida in the years following the transition to MLTSS. The DD estimate, which is reported below each graph, is a 0.6 percentage point decline, representing a a 7.2 percent effect when evaluated relative to Florida's mean in the pre-period. Figure 1(b) suggests that there may similarly be a decrease in New York, although it is smaller in magnitude and only marginally significant.

Sub-figures (c) and (d) of Figure 1 suggest that the shift away from full-dual benefits corresponds to an increase in enrollment in partial-dual benefits, although there is also some indication of a pre-trend in this outcome in Florida.

These findings could reflect beneficiaries' preferences for avoiding Medicaid's MLTSS mandates,

possibly due to their desires to access broader provider networks or to avoid documented frictions associated with plan switching if they are not satisfied with their initial plan choices (Salehian et al., 2022; Li, 2023). Regardless of the underlying reasons for these empirical patterns, they call attention to the importance of accounting for compositional changes in the full-dual population when studying other outcomes. Therefore, when measuring impacts on utilization outcomes, we use a balanced panel of Medicare beneficiaries who are continuously enrolled in full-dual benefits for the duration of the event window. And when studying mortality, we do not condition on enrollment in full-dual benefits.

5.2 Healthcare utilization

Preventive care. Figure 2 presents event-study estimates for two outcomes: an indicator for any E&M visits with a PCP (observed on a quarterly basis), and an indicator for any influenza vaccination (observed annually).

In Florida, we find that both measures of preventive care decline following the transition to MLTSS. The probability of any E&M office visit decreases by 2.2 percentage points (7.4 percent relative to the pre-treatment mean) in the four quarters after the mandate, while the likelihood of receiving any influenza vaccination decreases by 1.8 percentage points (12.0 percent) in the four subsequent years.

In New York, we find a smaller 0.5 percentage point (1.5 percent relative to the pre-treatment mean) reduction in the likelihood of any E&M visit with a PCP. The likelihood of receiving any influenza vaccination also decreases, although the estimate is not statistically significant.

Importantly, these decreases in preventive care utilization are unlikely to reflect a substitution in the place of care delivery. While it is possible that beneficiaries receive preventive care-type services in the context of MLTSS following the transition, claims for such care—including flu vaccines—should still appear in the Medicare claims, as they are covered by Medicare Part B.

Hospitalizations and ED visits. Figure 3 presents the event-study graphs for various categories of hospitalizations. In Florida, sub-figure (a) suggests an increase in overall hospitalizations following the MLTSS mandate, but the DD estimate is not statistically significant. However, when we consider emergent hospitalizations in sub-figure (c), we see a clear and statistically significant increase in the four quarters following the mandate. The probability of any emergent hospitalization increases by 0.2 percentage points (4.1 percent relative to the pre-period mean). Further, in line with the decline in influenza vaccinations, we observe a 0.01 percentage point (25 percent) increase in hospitalizations

with an influenza diagnosis.

In New York, we do not find any statistically significant changes in hospitalizations overall, or in emergent hospitalizations specifically. We do observe a 0.01 percentage point (50 percent) increase in hospitalizations with an influenza diagnosis, although the DD estimate is only significant at the 10% level.

Figure 4 presents the event-study graphs for different types of ED visits. We consider overall ED visits in sub-figures (a) and (b), and then split into four categories based on the NYU Center for Health and Public Service Research's billings algorithm: emergent, needed and not preventable ((c) & (d)), emergent, needed and preventable ((e) & (f)), emergent and primary care treatable ((g) & (h)), and non-emergent ((i) & (j)).

While we do not observe any changes in ED visits in New York, we find reductions in ED visits in Florida following the transition to MLTSS. Specifically, we find reductions of 0.2 percentage points (5.5 percent), 0.07 percentage points (2.7 percent), 0.3 percentage points (5.3 percent), and 0.2 percentage points (5.1 percent), respectively, in the probability of ED visits in each of the four categories. Additional analyses suggest that the reductions in ED visits are driven by outpatient-care only visits, while ED visits that result in hospitalization actually increase (consistent with the finding on emergent hospitalizations). This pattern indicates that while Florida Medicaid's shift to MLTSS may have led to a reduced need for ED care for milder health issues, it instead has increased the need for ED and hospital care for more severe conditions.

Nursing home assessments. Figure 5(a) shows that the probability of receiving any nursing home assessment, our proxy for a nursing home admission, does not change following the transition to MLTSS in Florida. This finding is perhaps surprising given the explicit financial incentives in Florida Medicaid's MLTSS related to shifting patients out of nursing home care.That said, it is possible that changes in the location of the provision of LTSS may take a longer time to materialize, and ongoing work is exploring this outcome with a longer follow-up window.

Lastly, while we observe a decrease in this outcome in New York, significant pre-existing trends suggest that the decrease is likely not directly attributable to the MLTSS transition.

5.3 Mortality

We present results on patient mortality in Figure 6, using our two measures of annual county mortality rates. When we calculate the mortality conditional on all Medicare enrollees aged 65 and above,

we find no significant changes in mortality rates in both states following the transition to MLTSS. When we use an alternative measure of mortality, which is calculated conditional on all Medicare beneficiaries aged 65 and above who are also enrolled in Medicaid (either as full- or partial-duals), we find that the mortality rate increases in New York by 0.3 percentage points (2.4 percent). However, the inconsistency between the two measures suggests caution in interpreting this mortality effect. All in all, the lower bounds of the 95% confidence intervals on our estimates suggest that we can rule out that MLTSS reduces mortality rates by more than 0.1 percentage points (1.3 percent relative to the pre-period mean in Figure 6c) in Florida or 0.06 percentage points (1.4 percent relative to the pre-period mean in Figure 6b) in New York.

5.4 Heterogeneity analyses

In this section, we examine how the main results vary across patients' pre-existing diagnosis and their race/ethinicity. Appendix Figures A3-A8 present the DD estimates by subgroups for our main outcomes.

Beneficiaries with a pre-existing Alzheimer's diagnosis. Our main analysis so far has focused on those who were enrolled in Medicare and Medicaid as full dual beneficiaries. While this population includes individuals who were affected by the shift to MLTSS, we are unable to directly observe which beneficiaries were functionally eligible for the LTSS. To address this issue, we focus on a sub-group of beneficiaries who have a pre-existing Alzheimer's diagnosis, since they are likely to meet the functional eligibility criteria.

For most outcomes, we find that the effects for this sub-group are not statistically different from the effects in the overall sample in each state. Notably, however, while the overall effects on hospitalizations and ED visits are not statistically significant in New York, we find significant increases in these outcomes for patients with Alzheimer's. Moreover, we observe a decrease in nursing home assessments in Florida and a marginally significant increase in New York for the sub-group of patients with an Alzheimer's diagnosis.

The stark contrast in the effects on nursing home care between New York and Florida may reflect differences in risk-adjustment used in the MLTSS payment models between these two states. While New York uses a sophisticated algorithm based on a large number of predictors, including an indicator for Alzheimer's diagnosis, capitation payments are not risk-adjusted for any specific diagnosis in Florida. Florida's MLTSS plans instead received a blended rate based on the share of enrollees in

nursing homes versus home- and community settings, and this rate is further adjusted to incentivize plans to move patients out of nursing homes. As a result, MLTSS plans in Florida may face a stronger incentive to shift high-cost patients (such as those with Alzheimer's) out of nursing homes.

Heterogeneity by patients' race/ethnicity. We further examine whether the shift to MLTSS had differential impacts on patients depending on their race/ethnicity. Because race and ethnicity are not considered in setting the capitation rates in both states, plans may be under-paid for patients in racial groups with higher-than-average healthcare needs, while being over-paid for racial groups with lower-than-average healthcare needs (Kuziemko et al., 2018). This issue may be further exacerbated by the presence of racial bias in healthcare claims data (Obermeyer et al., 2019), which are used in setting capitation payments and developing the risk-adjustment algorithm in New York.

Overall, we do not find clear patterns of heterogeneity across patients' race/ethnicity. This is in contrast to prior work that has shown that shifts to Medicaid managed care models lead to disproportionate declines in health outcomes among Black children (Currie and Fahr, 2005), and Black pregnant women and their newborns (Kuziemko et al., 2018). The discrepancy may be due to the fact that we focus on an older population where the racial/ethnic differences in expected healthcare costs may be confounded by differences in age and remaining life expectancy.

6 Conclusion

Recent calls by the US government to reduce federal spending, including in the Medicaid program, underscore an urgent need to understand how public programs can operate efficiently and effectively.[24] This impetus, combined with the rapidly aging US population, suggests that the structure of Medicaid's coverage of long-term services and supports—for which the program paid more than $255 billion in 2022 (Chidambaram and Burns, 2024)—may play an important role in these considerations.

This paper studies how the shifts from FFS payment models to managed care systems in Florida and New York's Medicaid LTSS programs affect patients' healthcare utilization and mortality outcomes. We focus on dual-eligible Medicaid-Medicare beneficiaries aged 65 and above, and use a stacked DD empirical design based on the county-by-county transitions to MLTSS in the two states. We study outcomes observed in Medicare claims data, for which Medicare is the primary payer, thus

[24]For a summary of the issues related to Medicaid funding cuts, see Urban Institute's report here: https://www.urban.org/research/publication/reducing-federal-support-medicaid-expansion-would-shift-costs-states-and.

measuring downstream impacts of MLTSS on healthcare not included under managed care.

We find that MLTSS leads to a dis-enrollment in full dual benefits that are needed for Medicaid to cover LTSS. This pattern may reflect beneficiaries' desire to avoid Medicaid's MLTSS plans, and is consistent with prior research indicating low patient satisfaction with some plans in other states (Salehian et al., 2022). Focusing on beneficiaries who are continuously enrolled in full dual benefits for a period of time from before to after the shift to MLTSS, we find a reduction in the use of preventive care services, including E&M visits with PCPs and influenza vaccinations, in both Florida and New York. We also find increases in emergent hospitalizations in Florida, and in hospitalizations with a flu diagnosis in both states. Additionally, ED visits in outpatient settings decrease in Florida, and do not change in New York.

When studying nursing home admissions, we find a decrease in Florida, but only among patients with a prior Alzheimer's diagnosis. This result likely reflects the direct financial incentives in Florida Medicaid's capitation payments to LTSS plans that do not provide additional resources for patients with this diagnosis but penalize them for having too many patients in nursing homes relative to community-based and home-based settings. In New York, where capitation payments are risk-adjusted for various conditions, including Alzheimer's, there is no such decrease in nursing home usage.

Finally, we do not find any evidence that mortality declines following the shift to MLTSS in either state, and we can rule out even relatively small decreases of 0.1 percentage points. All together, our findings indicate that Medicaid MLTSS reduces the use of preventive care, while increasing the incidence of likely serious health issues that require urgent hospital stays. These changes do not appear to save lives (while also not meaningfully increasing deaths), but likely lead to higher costs borne by the (mostly federally funded) Medicare program. Ongoing analysis is measuring these impacts on Medicare costs directly.

An important limitation of this paper is that we do not observe any LTSS directly and we cannot study heterogeneity across different types of MLTSS plans. Prior work documents that Medicaid managed care plans differ substantially in terms of their spending and networks (Geruso et al., 2023; Wallace, 2023), suggesting that there is likely important heterogeneity in impacts across MLTSS plans as well. Future work should consider these issues to better understand the mechanisms behind the effects on healthcare outcomes documented here.

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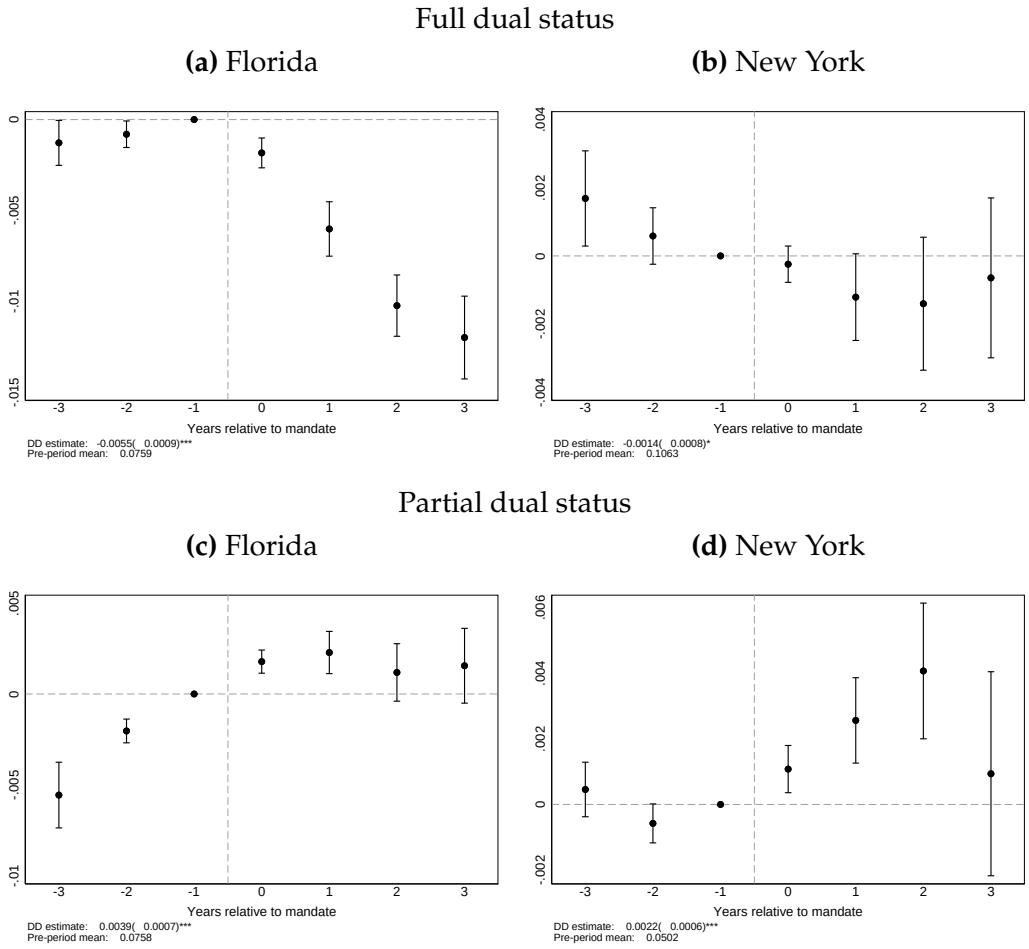
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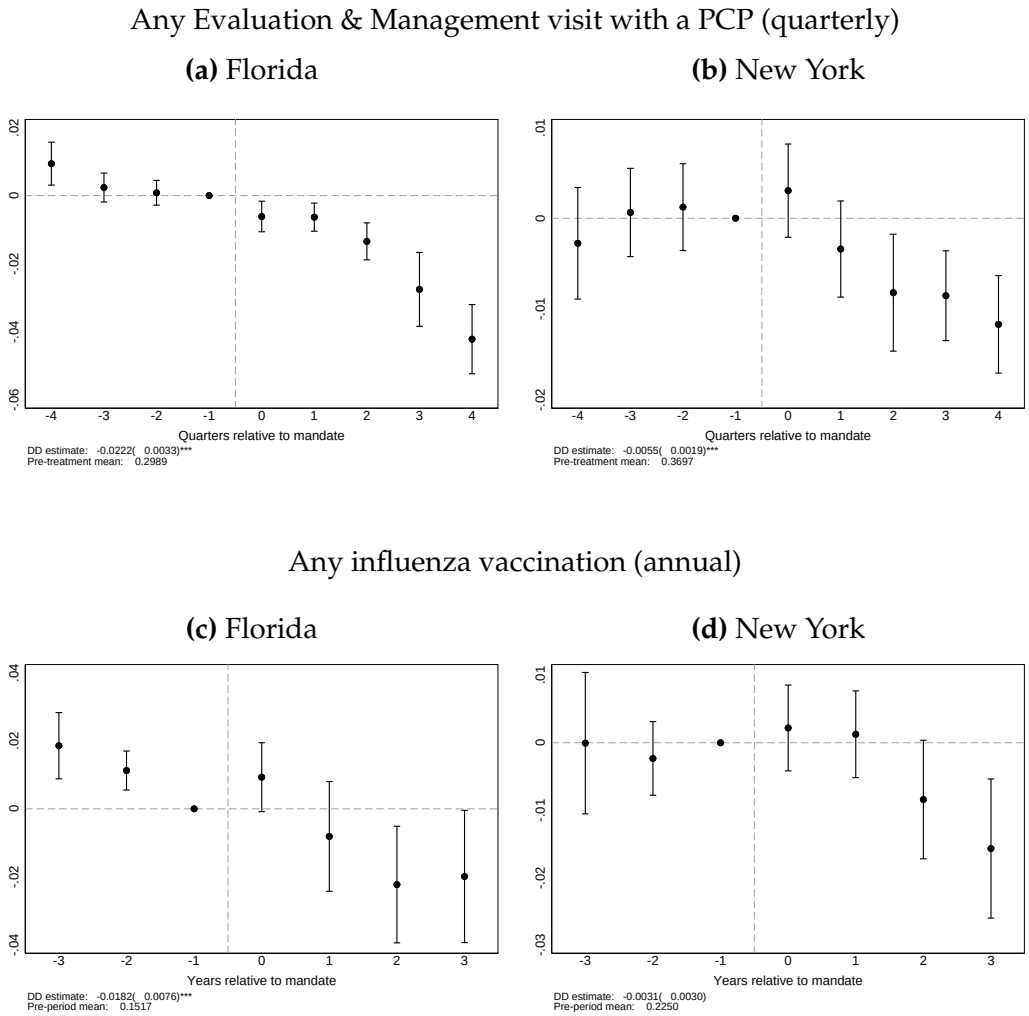
7 Figures and Tables

Figure 1: Event-study estimates of the impacts of MLTSS mandates on dual status



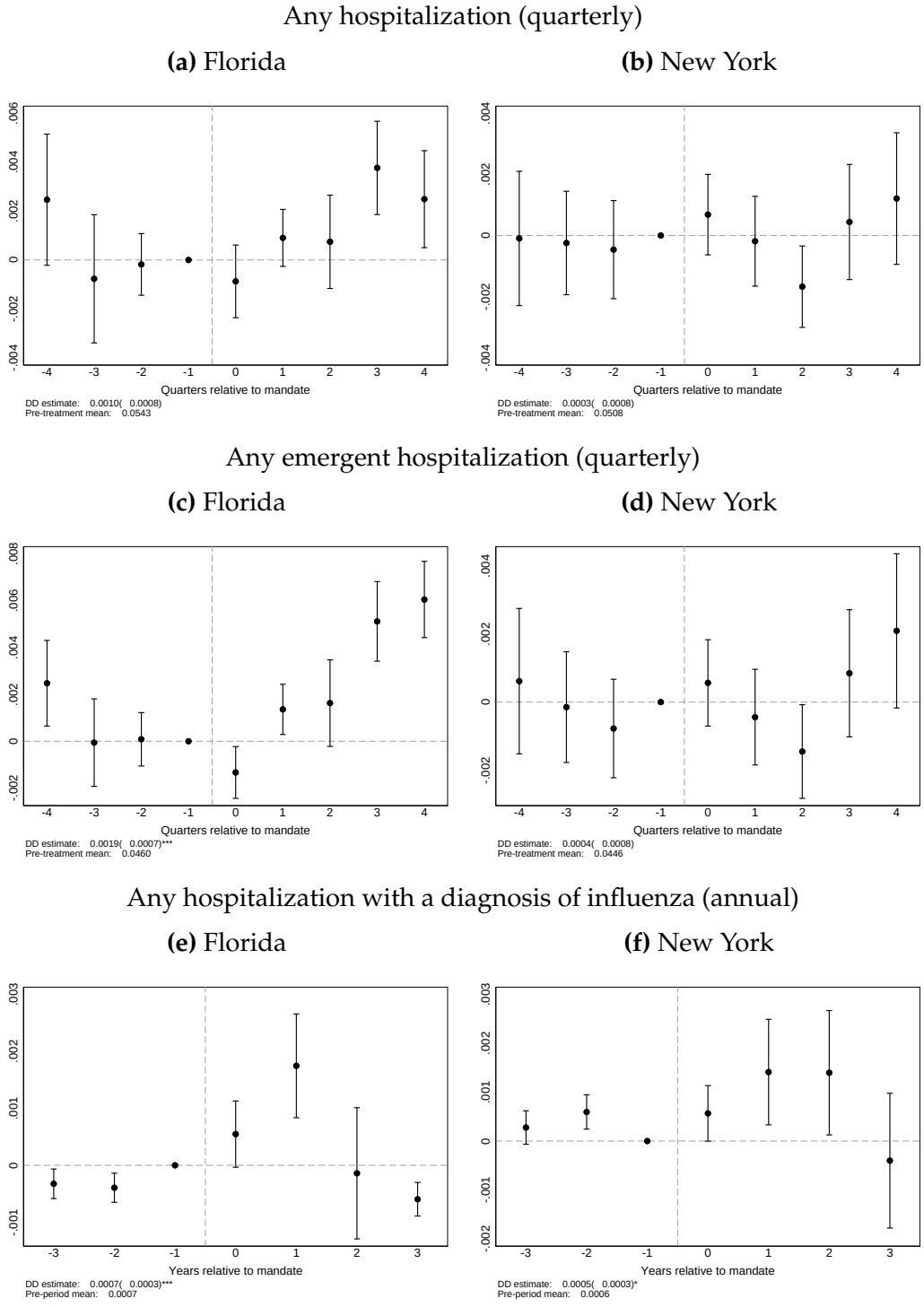
Notes: These figures plot the stacked event-study coefficients and 95% confidence intervals from estimating a county×year version of equation (2) with county-by-experiment and year-by-experiment fixed effects. For each of the sub-figures, the outcome is the number of individuals with a particular dual status (full or partial dual) at any point in the year, among all Medicare beneficiaries who are aged 65 or older at the beginning of the year. Our analysis of full and partial dual status includes 1,183 county-year observations in Florida and 2,310 county-year observations in New York.

Figure 2: Event-study estimates of the impacts of MLTSS mandates on primary and preventive care utilization



Notes: These figures plot the stacked event-study coefficients and 95% confidence intervals from estimating equation (2). We observe utilization of primary and preventative care services in the carrier files for a random 20 percent of beneficiaries. Our analysis of PCP E&M visits includes 1,568,712 beneficiary-quarter observations in Florida and 2,442,345 beneficiary-quarter observations in New York. Our analysis of influenza vaccinations includes 630,540 beneficiary-year observations in Florida and 708,342 beneficiary-year observations in New York. We use the Berenson-Eggers Type of Service (BETOS) codes "M1A" and "M1B" to identify new and established Evaluation & Management office visits, respectively. We use the CMS provider specialty codes "01" (General practice), "08" (Family practice), '11" (Internal medicine), and "84" (Preventative medicine) to categorize these E&M visits as occurring with a primary care physician (PCP). To identify influenza immunizations, we use BETOS code "O1G". See notes under Table 1 for information about the analysis sample.

Figure 3: Event-study estimates of the impacts of MLTSS mandates on hospitalizations

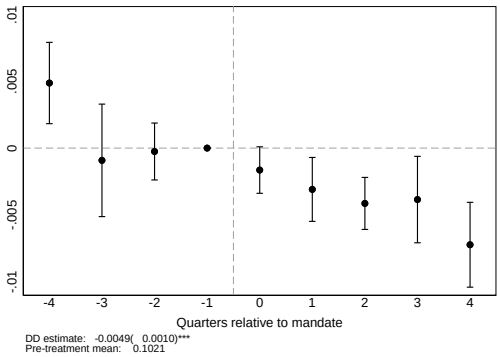


Notes: These figures plot the stacked event-study coefficients and 95% confidence intervals from estimating equation (2). Our analysis of any and emergent hospitalizations is based on 7,867,836 beneficiary-quarter observations in Florida and 12,241,386 beneficiary-quarter observations in New York. Our analysis of any hospitalization with a diagnosis of influenza (annual) is based on 3,180,730 beneficiary-year observations in Florida and 3,544,198 beneficiary-year observations in New York. We observe hospitalizations for the full sample. "Emergent" hospitalizations are those in which "the patient required immediate medical intervention as a result of severe, life threatening, or potentially disabling conditions. Generally, the patient was admitted through the emergency room" (ResDAC, n.d.). We categorize a hospitalization as having a diagnosis of influenza using ICD-9 (487) and ICD-10 (J09-J18) codes. See notes under Table 1 for information about the analysis sample.

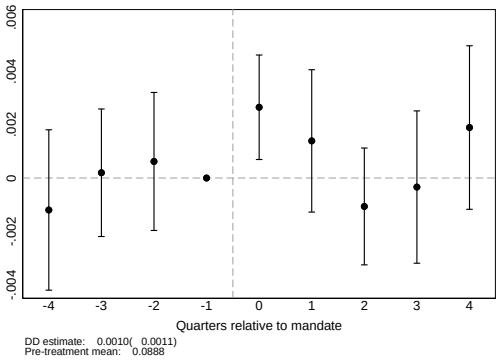
Figure 4: Event-study estimates of the impacts of MLTSS mandates on emergency department visits

Any ED visit

(a) Florida

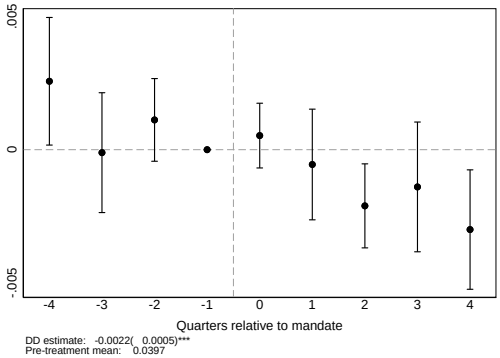


(b) New York

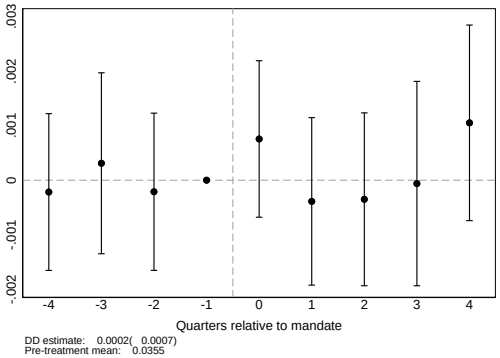


Any needed and not preventable ED visit

(c) Florida

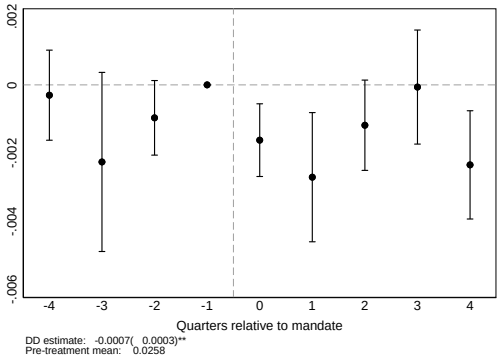


(d) New York

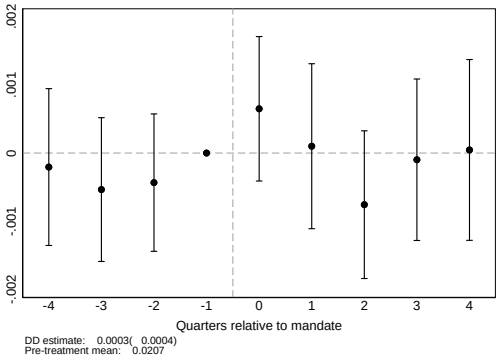


Any needed preventable ED visit

(e) Florida

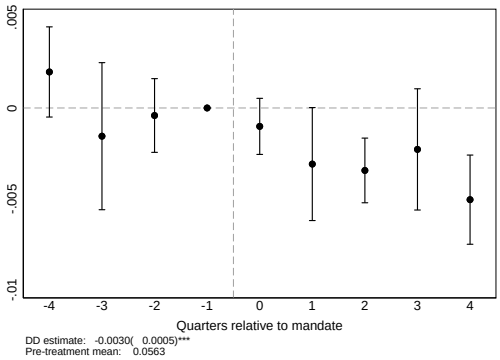


(f) New York

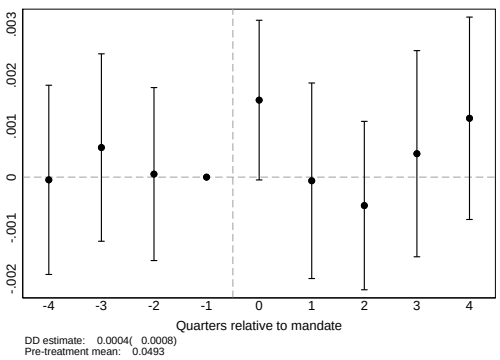


Any emergency primary care treatable ED visit

(g) Florida

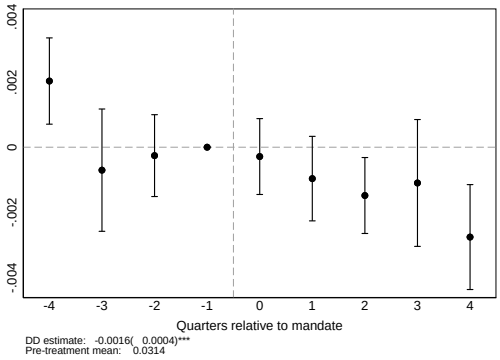


(h) New York

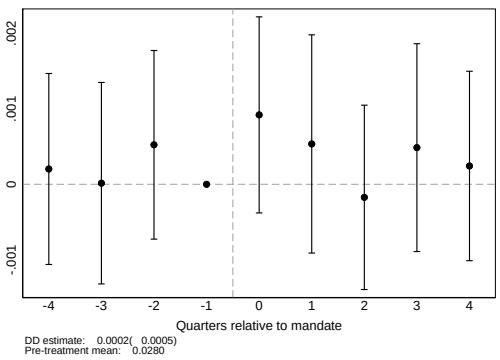


Any non-emergent ED visit

(i) Florida

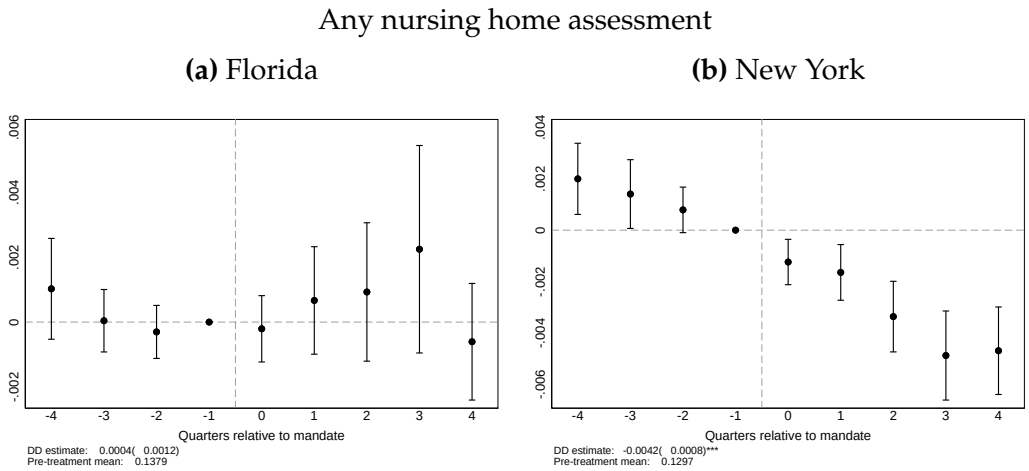


(j) New York



Notes: These figures plot the stacked event-study coefficients and 95% confidence intervals from estimating equation (2). Our analysis of ED visits is based on 7,867,836 beneficiary-quarter observations in Florida and 12,241,386 beneficiary-quarter observations in New York. We observe ED visits for the full sample. We identify ED visits in the inpatient and outpatient files using revenue center codes "0450", "0451", "0452", '0453", "0454", "0455", "0456", "0457", "0458", "0459", and "0981". We use the algorithm developed by the New York University Center for Health and Public Service Research to categorize ED visits by their necessity and severity. See notes under Table 1 for information about the analysis sample.

Figure 5: Event-study estimates of the impacts of MLTSS mandates on nursing home utilization

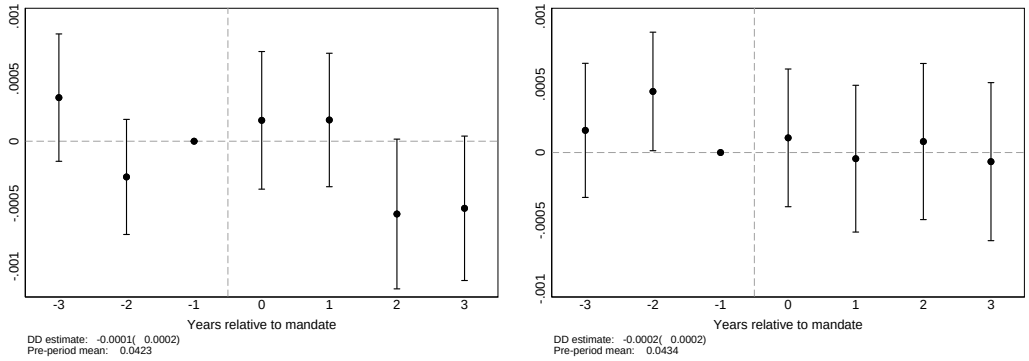


Notes: These figures plot the stacked event-study coefficients and 95% confidence intervals from estimating equation (2). Our analysis of nursing home assessments is based on 7,867,836 beneficiary-quarter observations in Florida and 12,241,386 beneficiary-quarter observations in New York. We observe nursing home assessments that occur on a given date in the Minimum Data Set (MDS) 3.0. See notes under Table 1 for information about the analysis sample.

Figure 6: Event-study estimates of the impacts of MLTSS mandates on mortality

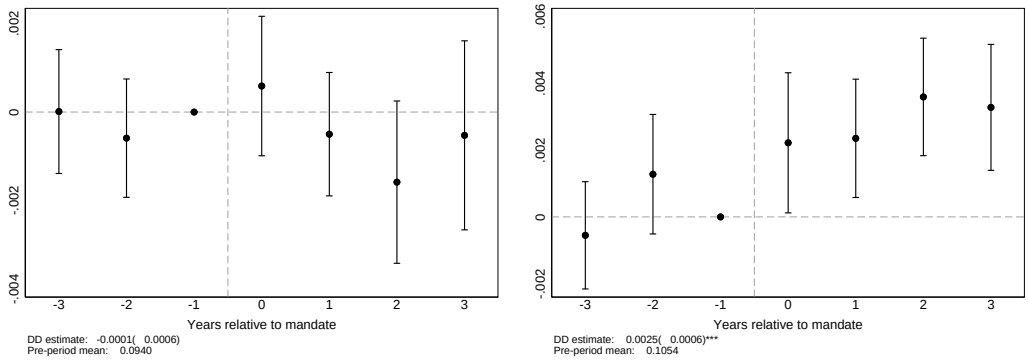
Definition 1: share dead of all aged 65+ Medicare beneficiaries

(a) Florida **(b)** New York



Definition 2: share dead of all aged 65+ full- or part-dual Medicare beneficiaries

(c) Florida **(d)** New York



Notes: These figures plot the stacked event-study coefficients and 95% confidence intervals from estimating a county×year version of equation (2) with county-by-experiment and year-by-experiment fixed effects. In the top panel, the outcome is the number of individuals who have died, among all Medicare beneficiaries who are aged 65 or older at the beginning of the year. In the bottom panel, the outcome is the number of individuals who have died, among all full or partial duals who are aged 65 or older at the beginning of the year. These analyses are based on 1,183 county-year observations in Florida and 2,310 county-year observations in New York.

Table 1: Summary statistics (at baseline)

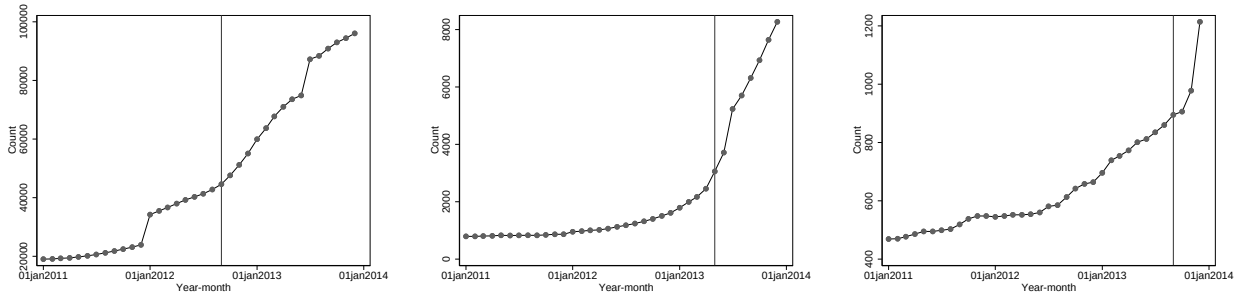
	Florida analysis		New York analysis	
	(1)	(2)	(3)	(4)
	Florida	California	New York	Pennsylvania
Percent female	70%	63%	68%	71%
Percent aged 65-74	41%	48%	43%	49%
Percent aged 75-84	42%	40%	41%	33%
Percent aged 85+	22%	16%	21%	22%
Percent non-Hispanic white	42%	46%	48%	71%
Percent non-Hispanic Black	17%	7%	19%	20%
Percent Hispanic	35%	17%	13%	3%
Percent with any chronic condition	88%	90%	93%	88%
Percent with Alzheimer's	19%	7%	13%	12%
Percent with arthritis	60%	50%	57%	48%
Percent with chronic kidney disease	27%	23%	24%	23%
Percent with depression	49%	30%	36%	38%
Percent with diabetes	50%	47%	55%	41%
Percent with ischemic heart disease	60%	43%	60%	47%
Percent with heart failure	36%	28%	41%	30%
Percent with hypertension	80%	78%	82%	74%
Observations (unique individuals)	173,002	252,644	319,123	168,291

Notes: This table presents the summary statistics of the analysis sample used to estimate equations (1) and (2). Each observation is an individual in the quarter before the transition to MLTSS. The sample includes individuals who are aged 65 or older as of four quarters before the transition to MLTSS, and who are continuously enrolled in full dual benefits over an event window that spans four quarters before the transition to MLTSS, the quarter of the transition to MLTSS, and four quarters after. In our stacked DD design, individuals in the control group (in never-treated counties in California and Pennsylvania) can appear across multiple experiments. For these individuals, we report their characteristics using the first time that they appear in the data.

ONLINE APPENDIX

Appendix Figure A1: Number of full dual beneficiaries enrolled in MLTC plans in New York

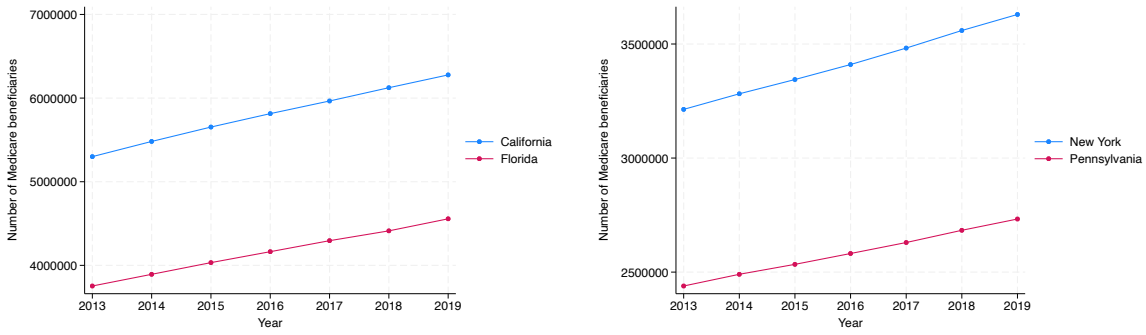
(a) September 2012 mandate **(b)** May 2013 mandate **(c)** September 2013 mandate



Notes: This figure presents the number of full-benefit duals who are enrolled in a New York managed long-term care (MLTC) plan in each month-year, as observed in the Medicaid Analytic eXtract (MAX) data. The vertical line in each figure indicates the time of the transition to MLTSS. Sub-figure (a) includes full duals enrolled in MLTC plans in Bronx, Kings, New York, Queens, and Richmond counties. Sub-figure (b) includes full duals enrolled in MLTC plans in Nassau, Suffolk, and Westchester counties. Sub-figure (c) includes full duals enrolled in MLTC plans in Rockland and Orange counties.

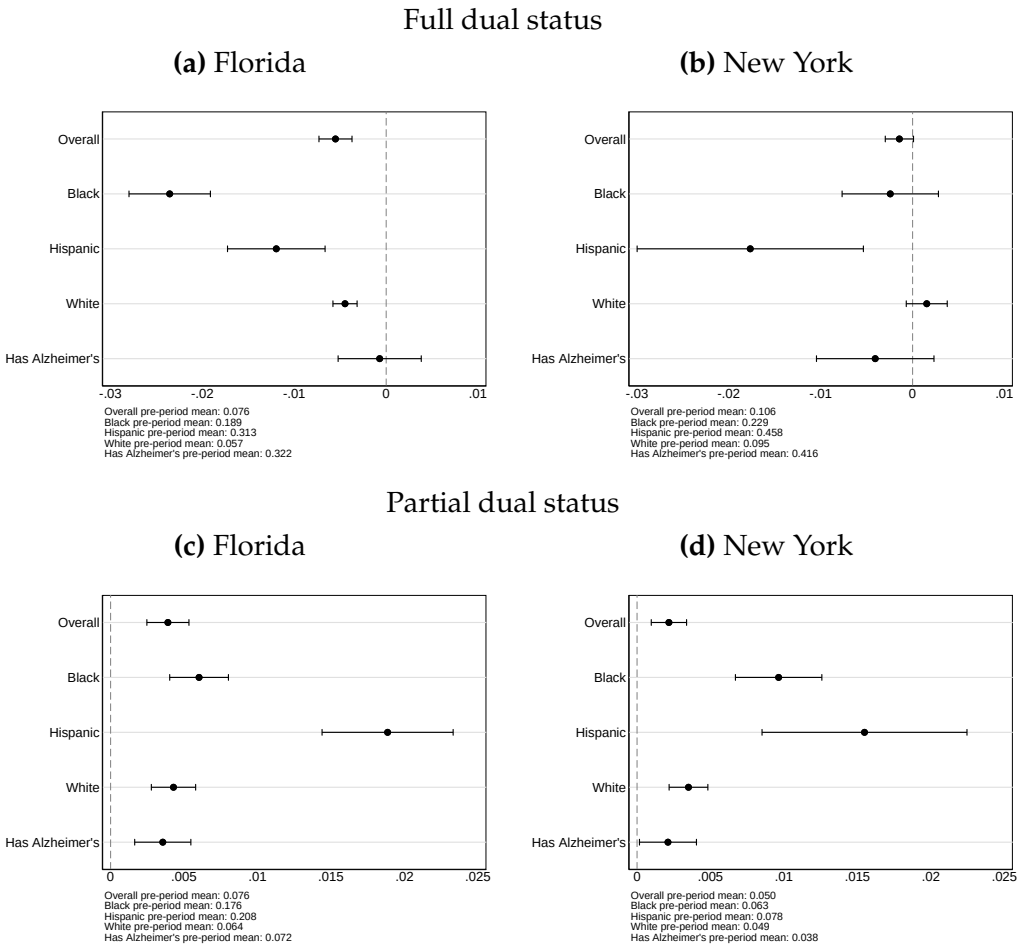
Appendix Figure A2: Trends in Medicare enrollment

(a) California vs. Florida **(b)** New York vs. Pennsylvania



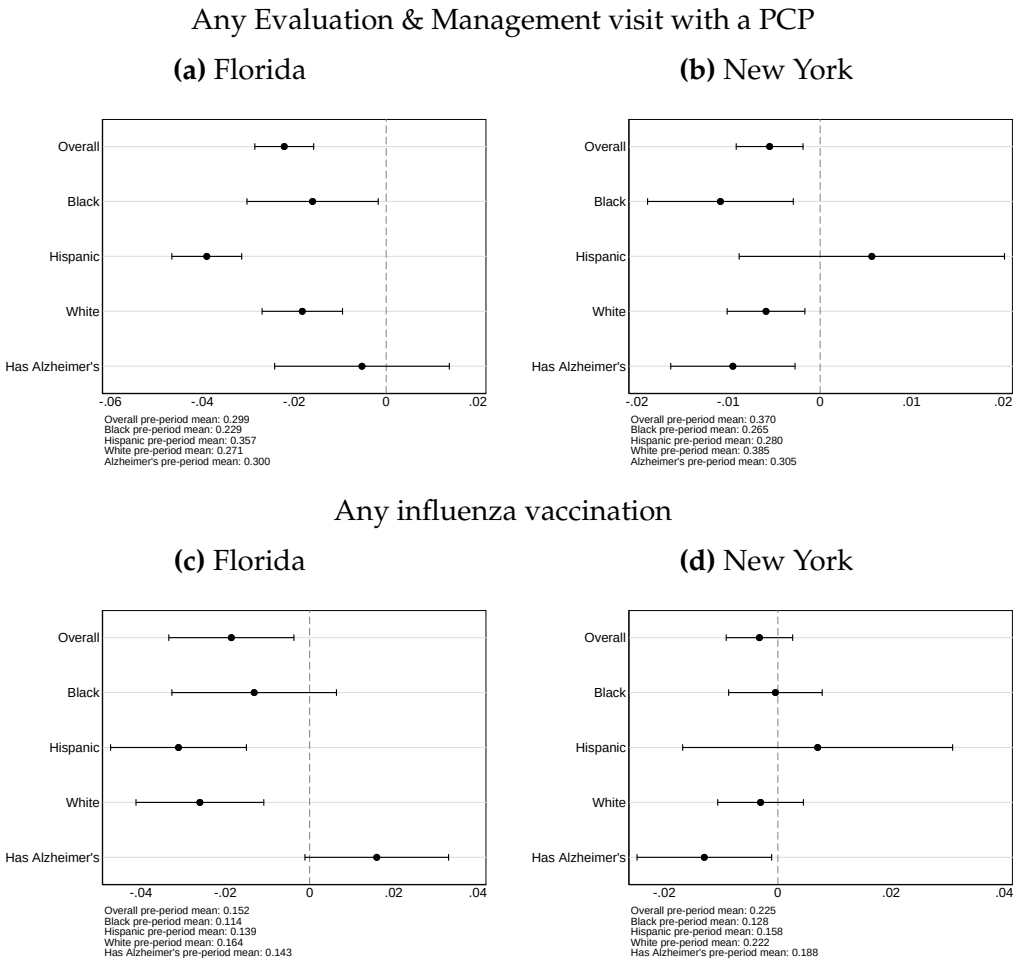
Notes: This figure presents the number of Medicare enrollees between 2013 and 2019. Sub-figure (a) compares the trends in Medicare enrollment between California and Florida, while sub-figure (b) plots the trends for New York and Pennsylvania. *Sources*: Kaiser Family Foundation. Centers for Medicare & Medicaid Services, Office of Enterprise Data and Analytics, Chronic Conditions Data Warehouse.

Appendix Figure A3: Pooled stacked difference-in-differences estimates of the impacts of MLTSS mandates on dual status, by sub-group



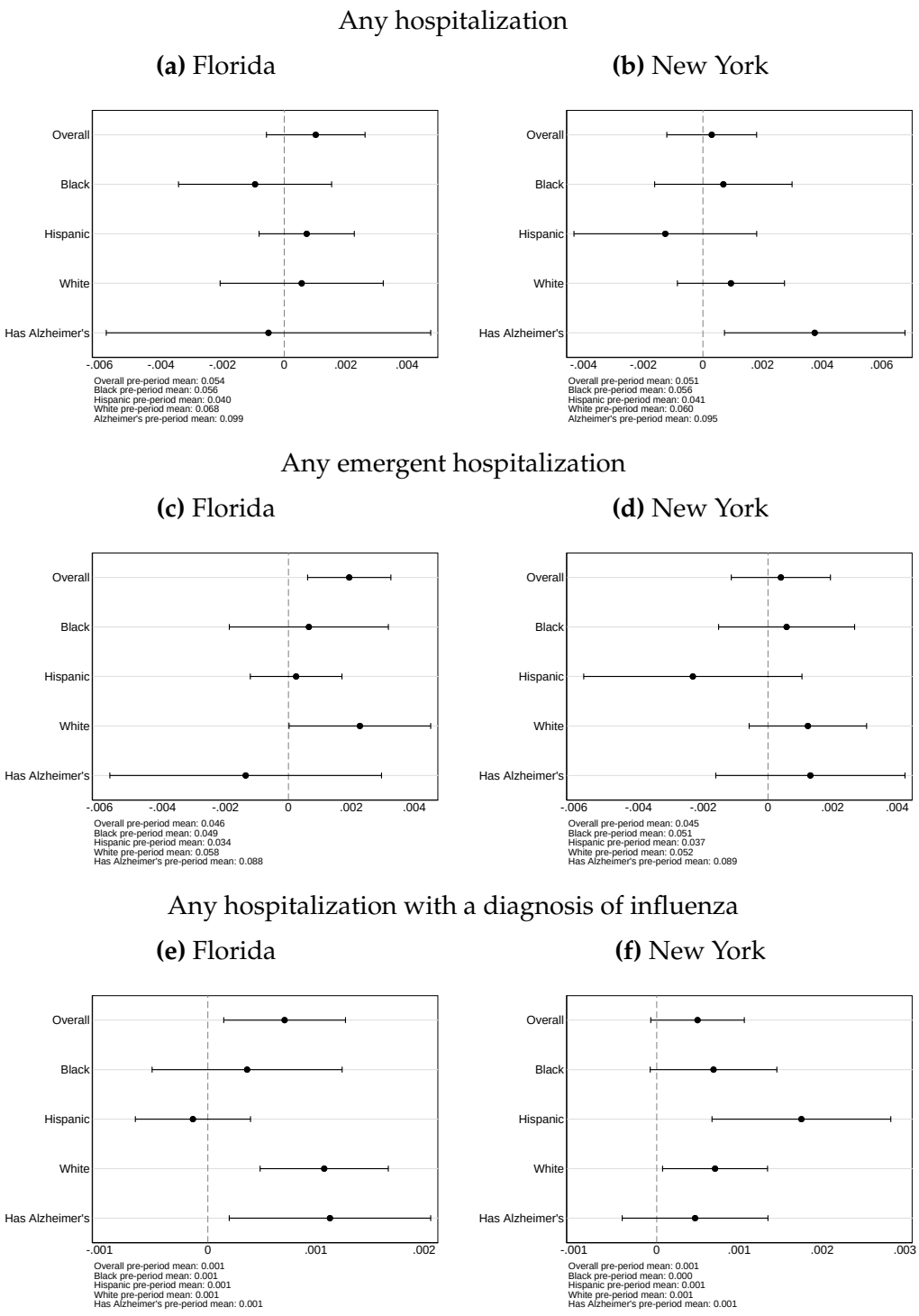
Notes: This figure plot the stacked difference-in-differences coefficients and 95% confidence intervals from estimating equation (1) for each sub-group. We categorize an individual as having Alzheimer's if they have a diagnosis for Alzheimer's by the quarter before the transition to MLTSS. See notes under Figure 1 for details about the outcome and sample.

Appendix Figure A4: Pooled stacked difference-in-differences estimates of the impact of MLTSS mandates on primary and preventive care utilization, by sub-group



Notes: This figure plot the stacked difference-in-differences coefficients and 95% confidence intervals from estimating equation (1) for each sub-group. We categorize an individual as having Alzheimer's if they have a diagnosis for Alzheimer's by the quarter before the transition to MLTSS. See notes under Figure 2 for details about the outcome and sample.

Appendix Figure A5: Pooled stacked difference-in-differences estimates of the impacts of MLTSS mandates on hospitalizations, by sub-group

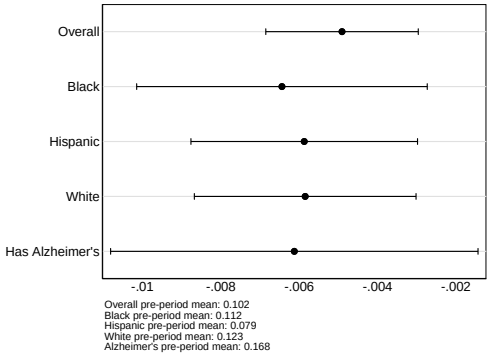


Notes: This figure plot the stacked difference-in-differences coefficients and 95% confidence intervals from estimating equation (1) for each sub-group. We categorize an individual as having Alzheimer's if they have a diagnosis for Alzheimer's by the quarter before the transition to MLTSS. See notes under Figure 3 for details about the outcome and sample.

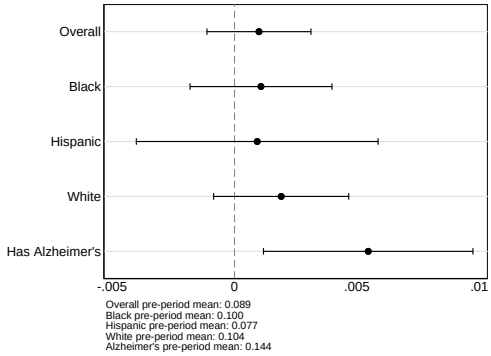
Appendix Figure A6: Pooled stacked difference-in-differences estimates of the impacts of MLTSS mandates on ED visits, by sub-group

Any ED visit

(a) Florida

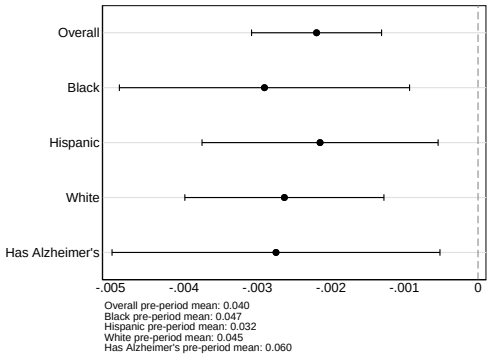


(b) New York

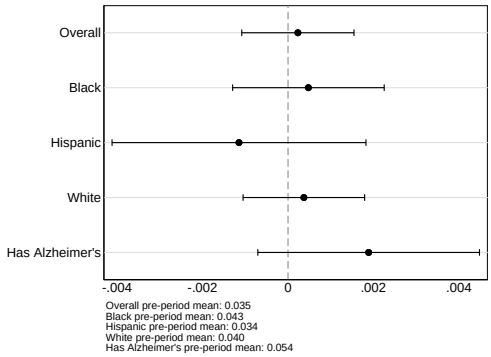


Any needed and not preventable ED visit

(c) Florida

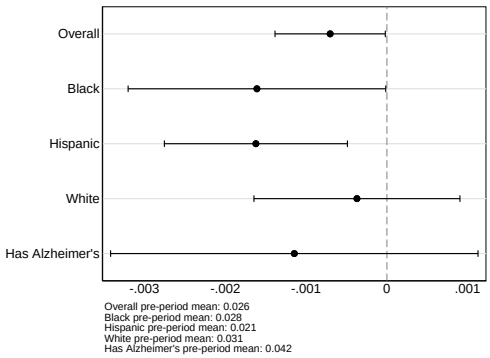


(d) New York

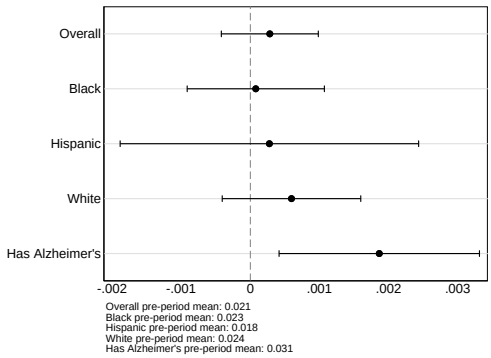


Any needed preventable ED visit

(e) Florida

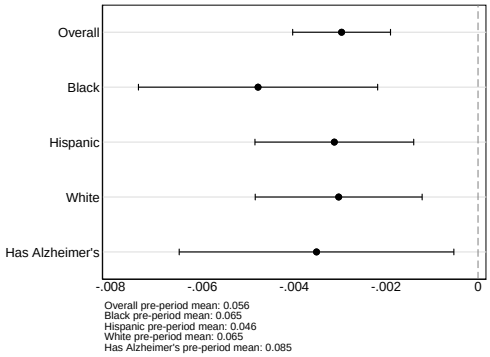


(f) New York

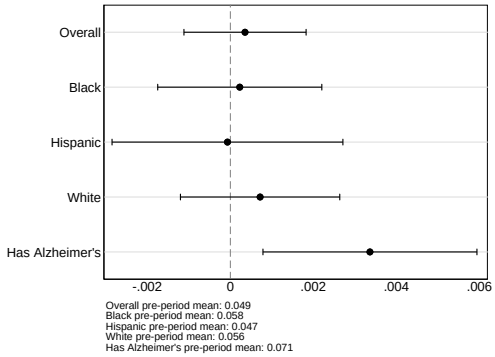


Any emergency primary care treatable ED visit

(g) Florida

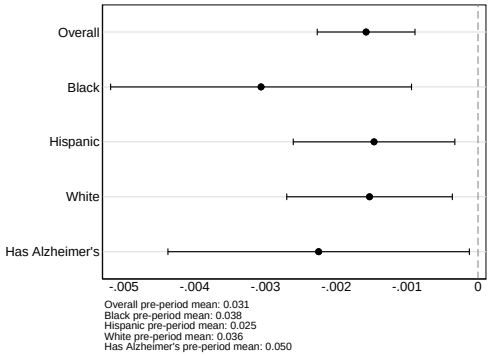


(h) New York

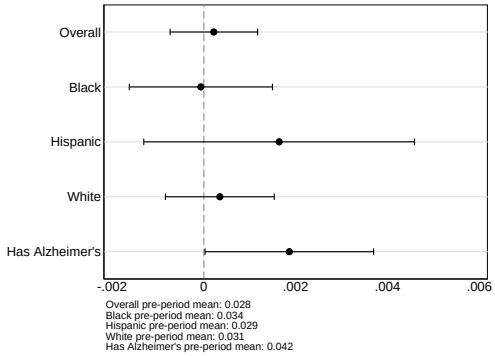


Any non-emergent ED visit

(i) Florida

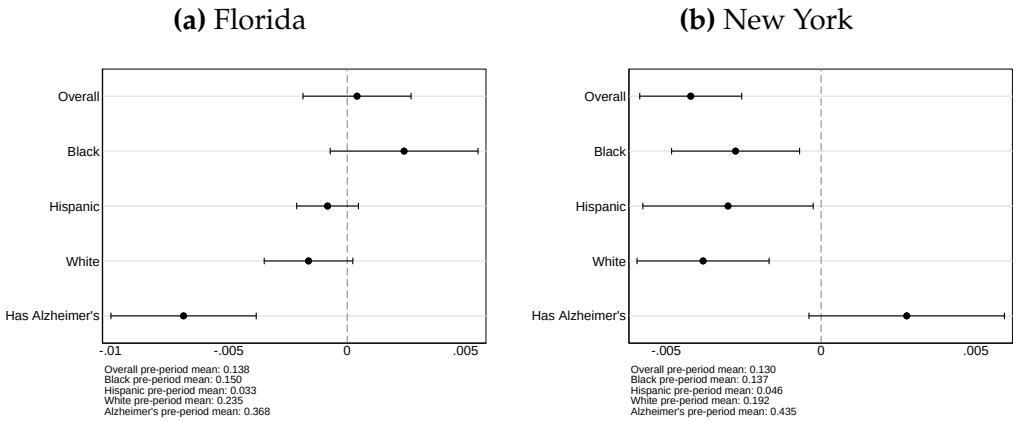


(j) New York



Notes: This figure plot the stacked difference-in-differences coefficients and 95% confidence intervals from estimating equation (1) for each sub-group. We categorize an individual as having Alzheimer's if they have a diagnosis for Alzheimer's by the quarter before the transition to MLTSS. See notes under Figure 4 for details about the outcome and sample.

Appendix Figure A7: Pooled stacked difference-in-differences estimates of the impacts of MLTSS mandates on nursing home assessments, by sub-group

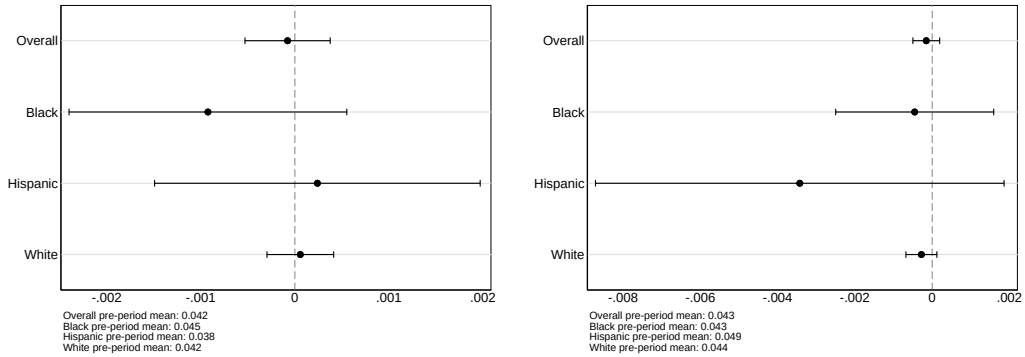


Notes: This figure plot the stacked difference-in-differences coefficients and 95% confidence intervals from estimating equation (1) for each sub-group. We categorize an individual as having Alzheimer's if they have a diagnosis for Alzheimer's by the quarter before the transition to MLTSS. See notes under Figure 5 for details about the outcome and sample.

Appendix Figure A8: Pooled stacked difference-in-differences estimates of the impacts of MLTSS mandates on mortality, by sub-group

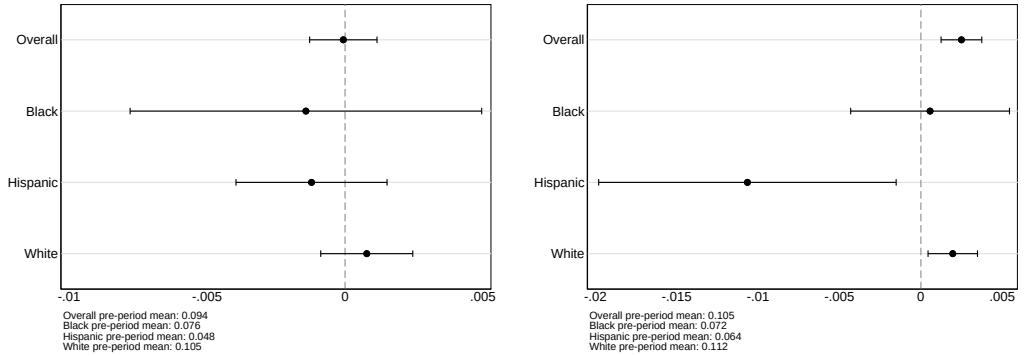
Definition 1: share dead of all aged 65+ Medicare beneficiaries

(a) Florida **(b)** New York



Definition 2: share dead of all aged 65+ full- or part-dual Medicare beneficiaries

(c) Florida **(d)** New York



Notes: This figure plot the stacked difference-in-differences coefficients and 95% confidence intervals from estimating equation (1) for each sub-group. We categorize an individual as having Alzheimer's if they have a diagnosis for Alzheimer's by the quarter before the transition to MLTSS. See notes under Figure 6 for details about the outcome and sample.

Appendix Table A1: Comparison of the MLTSS programs for dual-eligible beneficiaries in Florida and New York during the sample period

	Florida	New York
Risk adjustment	Based on population mix in nursing homes, home, and community settings	Based on an algorithm
Plan coverage†	Long-term care services only	Long-term care services only
Type of enrollment	Mandatory	Mandatory
Overall plan incentive	Capitation incentivizes cost reduction, while quality incentives encourage quality improvement	
Differential incentive by expected cost/race	A single, blended capitation rate incentivizes plans to avoid high-cost enrollees and/or to shift enrollees to lower-cost LTC settings	Incentives to risk-select enrollees when their expected costs are high relative to the regional average
Differential incentive by type of service	Incentives to reduce costs in Medicaid long-term care services	Incentives to reduce costs in Medicaid long-term care services

† Both Florida and New York also offer full-capitation plans (such as Program of All-Inclusive Care for the Elderly) that cover both Medicaid and Medicare services. Enrollment in these plans is voluntary.

Appendix Table A2: Timing of MLTSS mandates in Florida and New York

State	Month	Quarter	Counties Mandated
Florida	8/2013	2013 Q3	Brevard, Orange, Osceola, Seminole
	9/2013	2013 Q3	Charlotte, Collier, DeSoto, Glades, Hendry, Indian River, Martin Lee, Okeechobee, Palm Beach, Sarasota, St. Lucie
	11/2013	2013 Q4	Bay, Calhoun, Franklin, Gadsden, Gulf, Holmes, Jackson, Jefferson, Leon, Liberty, Madison, Taylor, Wakulla, Washington
	12/2013	2013 Q4	Broward, Miami-Dade, Monroe
	2/2014	2014 Q1	Hardee, Highlands, Hillsborough, Manatee, Pasco, Pinellas, Polk
	3/2014	2014 Q1	Alachua, Baker, Bradford, Citrus, Clay, Columbia, Dixie, Duval, Escambia, Flagler, Gilchrist, Hamilton, Hernando, Lafayette, Lake, Levy, Marion, Nassau, Okaloosa, Putnam, Santa Rosa, St. Johns, Sumpter, Suwannee, Union, Volusia, Walton
New York	9/2012	2012 Q3	Bronx, Kings, New York, Queens, Richmond
	5/2013	2013 Q2	Nassau, Suffolk, Westchester
	9/2013	2013 Q3	Rockland, Orange
	12/2013	2014 Q4	Albany, Erie, Onondaga, Monroe
	1/2014	2014 Q1	Columbia, Putnam, Sullivan, Ulster
	6/2014	2014 Q2	Cayuga, Herkimer, Oneida, Rensselaer
	7/2014	2014 Q3	Greene, Saratoga, Schenectady, Washington
	8/2014	2014 Q3	Dutchess, Montgomery, Broome, Fulton, Schoharie
	9/2014	2014 Q3	Delaware, Warren
	10/2014	2014 Q4	Niagara, Madison, Oswego
	11/2014	2014 Q4	Chenango, Cortland, Livingston, Ontario, Steuben, Tioga, Tompkins, Wayne
	12/2014	2014 Q4	Genesee, Orleans, Otsego, Wyoming
	1/2015	2015 Q1	Chautauqua, Chemung, Seneca, Schuyler, Yates, Allegany, Cattaraugus
	2/2015	2015 Q1	Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, St. Lawrence