NBER WORKING PAPER SERIES

SPILLOVERS IN PUBLIC BENEFIT ENROLLMENT: HOW DOES EXPANDING PUBLIC HEALTH INSURANCE FOR WORKING-AGE ADULTS AFFECT FUTURE HEALTH INSURANCE CHOICES?

M. Kate Bundorf
Melissa McInerney
Kosali I. Simon
Ruth Winecoff

Working Paper 32675
http://www.nber.org/papers/w32675

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 2024

Research reported in this manuscript was supported by the National Institute on Aging (NIA) of the National Institutes of Health (NIH) under Award Number R03AG059110. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. The authors thank participants at the National Bureau of Economic Research (NBER) Summer Institute, North Carolina State, and University of Massachusetts at Amherst for helpful comments and suggestions. The authors thank Mohan Ramanujan for advice on the administrative Medicare claims data. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

At least one co-author has disclosed additional relationships of potential relevance for this research. Further information is available online at http://www.nber.org/papers/w32675

Spillovers in Public Benefit Enrollment: How does Expanding Public Health Insurance for Working-Age Adults affect Future Health Insurance Choices?
M. Kate Bundorf, Melissa McInerney, Kosali I. Simon, and Ruth Winecoff
NBER Working Paper No. 32675
July 2024
JEL No. H0,H51,H75,I0,I13

ABSTRACT

Enrollment in one public benefit program often affects enrollment in others. We study life-course spillovers by examining how access to publicly subsidized health insurance prior to age 65 affects public benefit choices at the age of Medicare eligibility. We use administrative data to examine several Medicare enrollment choices: the heavily under-subscribed Medicaid "dual" coverage as a supplement to Medicare; Medicare Part D; the Part D Low Income Subsidy (LIS); and Medicare Advantage. Focusing on people living in low-income zip codes, we find a large increase in dual Medicaid among new Medicare beneficiaries in Medicaid expansion states relative to non- expansion states, as well as corresponding increases in healthcare use and reductions in out-of-pocket spending. The dual Medicaid increase exerts a bonus effect: greater take-up of LIS and Part D programs, which we attribute to the accompanying automatic enrollment in these programs. Our results on Medicare Advantage enrollment are inconclusive. Overall, our results suggest that experience with Medicaid before age 65 causes meaningful behavioral responses among the lowest-income beneficiaries when they age into Medicare; this emphasizes the importance of longitudinal spillovers also present in other public programs with eligibility criteria that differ by applicant age (e.g., Supplemental Nutrition Assistance Program (SNAP) and Supplemental Security Income (SSI)).

M. Kate Bundorf
Sanford School of Public Policy
Duke University
Durham, NC 27708
and NBER
kate.bundorf@duke.edu

Melissa McInerney
Department of Economics
Tufts University
Joyce Cummings Center 540E
177 College Avenue
Medford, MA 02155
and NBER
melissa.mcinerney@tufts.edu

Kosali I. Simon
O'Neill School of Public and
Environmental Affairs
Indiana University
1315 East Tenth Street
Bloomington, IN 47405-1701
and NBER
simonkos@indiana.edu

Ruth Winecoff
Edward J. Bloustein School of
Planning and Public Policy
Rutgers University
33 Livingston Ave
New Brunswick, NJ 08901
ruth.winecoff@rutgers.edu

1. Introduction

The safety net in the U.S. is highly fragmented, with a variety of means-tested programs which direct resources to people with different types of needs and at different points in their lives. Enrollment in several means-tested safety-net benefits is often incomplete, leaving many who are eligible not taking up publicly subsidized benefits (e.g., Currie, 2006; Ko and Moffitt, 2022). Fragmentation is especially high in health insurance, leading to concerns of excessive administrative burden, including in the unwinding of pandemic-related Medicaid rules.[1] Lack of cohesion in the safety net creates the potential for spillovers in enrollment across the varying types of means-tested benefits. Understanding the barriers to take-up of means-tested benefits and spillover effects between programs is important for the development of safety net policy. In the context we study, the interaction of Medicaid and Medicare, these spillovers may have important budgetary consequences, as Medicaid spending reached $806 billion and Medicare spending reached $944 billion in 2022.[2]

Prior research has uncovered many sources of enrollment spillovers. One type of spillover occurs when expanding the population eligible for a program increases take-up among those always eligible but not enrolled in the same program. For example, expanding the population of low-income adults eligible for Medicaid increased enrollment also among adults who were previously eligible for but not yet enrolled in coverage (e.g. Sonier et al., 2013; Sommers et al., 2014; Frean et al., 2017). Public health insurance expansions have also generated enrollment spillovers within families among the eligible but unenrolled children of adults who gained health insurance (e.g., Aizer and Grogger, 2003; Dubay and

[1] Weiland, Noah. November 9, 2023. "At Least 2 Million Children Have Lost Medicaid Insurance This Year." *New York Times.* https://www.nytimes.com/2023/11/09/health/medicaid-children-lost-coverage.html. Viewed May 21, 2024.

[2] Centers on Medicare and Medicaid Services. 2023. "NHE Fact Sheet." https://www.cms.gov/data-research/statistics-trends-and-reports/national-health-expenditure-data/nhe-fact-sheet#:~:text=Medicare%20spending%20grew%205.9%25%20to,29%20percent%20of%20total%20NHE. Viewed May 21, 2024.

Kenney, 2003; Kenney et al., 2010; Hudson and Moriya, 2017; Hamersma et al., 2019; Sacarny et al., 2022).

Spillovers may also occur within a person across types of benefits. For example, public health insurance expansions increased contemporaneous enrollment in other benefits, such as public food assistance (e.g., Baicker et al., 2014; Burney et al., 2021; Schmidt et al.), cash welfare (e.g., Schmidt et al., 2021), Social Security Disability Insurance (e.g., Maestas et al., 2014), and the Earned Income Tax Credit (EITC) (e.g., Schmidt et al., 2021).[3] Finally, enrollment spillovers may occur over the life course, with a person's take-up of social insurance at a point in time affecting their future take-up of other programs for which they are eligible (i.e. spillovers across programs within a person over time). While some studies have shown that early life exposure to safety net benefits does not lead to an increased propensity to receive such benefits at older ages (e.g. Guldi et al., forthcoming; Hoynes et al., 2016; Miller and Wherry, 2019), others have shown that public health insurance expansions for the working age population have increased enrollment in public health insurance supplementing Medicare for people age 65 and over (McInerney et al., 2021, 2022; Barkowski et al., 2022).

In this paper, we examine the effect of earlier exposure to mean-tested, publicly subsidized insurance for low-income, working-age adults on their insurance choices at age 65 when they become eligible for public health insurance based on age and must make new enrollment decisions. The context we study is the Affordable Care Act's (ACA) Medicaid expansions, implemented in 2014, which dramatically increased health insurance coverage among low-income working-age adults in the U.S. (see, e.g., Gruber and Sommers, 2019); by 2020, over 18 million people ages 19-64 were enrolled in publicly funded insurance under expanded Medicaid.[4] While the take-up of basic Medicare (i.e., Part A hospital

[3] The expected relationship between Medicaid expansions and Supplemental Security Income (SSI) is more nuanced because SSI confers Medicaid eligibility; in the absence of Medicaid expansion individuals might seek SSI in order to gain Medicaid coverage. Accordingly, research finds that Medicaid expansion reduces SSI participation (e.g., Burns and Dague, 2017; Burns et al., 2022; Soni et al., 2017), though there is mixed evidence of the effect of Medicaid expansion on SSI applications (e.g., Maestas et al., 2014; Schmidt et al., 2020; Anand et al. (2022)).

[4] ASPE Office of Health Policy. 2021. "Health Coverage Under the Affordable Care Act: Enrollment Trends and State Estimates." Issue Brief.

insurance) is nearly universal because Social Security recipients are automatically enrolled (Remler and Glied, 2003), beneficiaries face a complex set of choices with respect to the exact nature of their Medicare coverage including options which supplement and options which replace the publicly administered program. Two of these potential choices—Medicaid coverage which supplements Medicare and more generously subsidized prescription drug coverage (the low-income subsidy or LIS) – are means-tested social benefits with some of the lowest take-up rates among all social programs in the U.S. (Ungaro and Federman, 2009; Pezzin and Kasper, 2002; Caswell and Waidmann, 2017, NCOA, 2020).

We hypothesize that expanding publicly financed health insurance coverage to low-income adults nearing the age of Medicare eligibility may affect their decisions related to means-tested health insurance benefits at age 65. These enrollment spillovers could occur through two channels. First, exposure to Medicaid prior to age 65 may affect enrollees' perceptions of the value of publicly subsidized coverage. Demand for health insurance is likely to rise because an earlier experience with the safety net may lead to greater future demand for similar services and insurance to cover those services. The expected effect on demand for health care, however, is theoretically ambiguous; demand may rise because many types of healthcare, such as medications, may require ongoing consumption. Alternatively, earlier exposure may reduce pent up demand for health care upon entry to Medicare and prior exposure to health insurance might make individuals healthier when they reach the age of Medicare eligibility. As a second spillover channel, prior experience with the program may reduce administrative costs of applying for subsequent programs (e.g., Herd and Moynihan 2018; Schmidt et al., 2024).

We emphasize that our study examines longitudinal spillovers over a relatively short time period - we study people who have had access to coverage for only one to three years prior to age 65. Over longer periods of time, access to health insurance earlier in life may have larger effects on health at age 65 and

---

https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//200776/ASPE%20Issue%20Brief-ACA-Related%20Coverage%20by%20State.pdf. Viewed May 6, 2024.

may also impact eligibility for means-tested benefits at age 65 through any productivity effect of health insurance on subsequent income and wealth.

Leveraging quasi-random variation that arises from state decisions to adopt the Affordable Care Act (ACA) Medicaid expansion for adults ages 18-64, we use Medicare claims data from 2010 to 2017 and a difference-in-differences approach to estimate changes in health insurance choices for 65-year-olds who were exposed to Medicaid expansion for at least a year before aging into Medicare, before and after the ACA expansion relative to those not exposed to the expansion. We examine several types of insurance outcomes. Medicare beneficiaries with low-income and assets may be eligible for Medicaid supplementing Medicare. Medicare beneficiaries may also either remain in traditional Medicare or choose to receive their publicly funded benefits from a Medicare Advantage (MA) plan, a private alternative. While Medicare provides subsidized coverage for prescription drugs for all beneficiaries, they must choose to enroll in a private plan to obtain those benefits and may choose either a stand-alone prescription drug plan (PDP) or a prescription drug benefit as part of an MA plan. Medicare beneficiaries with low income are also eligible for the Low-Income Subsidy (LIS) or "Extra Help" for Part D. A key feature of our setting is that enrollment in the LIS is administratively linked to supplemental Medicaid because supplemental Medicaid enrollees are automatically enrolled in a PDP and the LIS. Thus, we examine take-up of four outcomes: supplemental Medicaid, PDPs, MA and the LIS.

We find evidence of important longitudinal spillovers in publicly funded insurance coverage. Sixty-five-year-olds residing in states that expanded Medicaid to adults ages 18-64 and who were young enough to participate in that expansion were nine percentage points (36 percent) more likely to be dually enrolled in Medicaid and Medicare relative to those residing in states without under 65 expansions. This is larger than prior findings with survey data (McInerney et al., 2021), demonstrating the importance of using administrative measures; surveys, which rely on self-report, tend to undercount Medicaid participation (e.g., Mellor et al., 2021; Lynch, 2008; Meijer, Karoly, and Michaud, 2010; Boudreaux et al., 2015; Card et al., 2004; Noon et al., 2018).[5] Importantly, we find the entire increase in Medicaid is concentrated in full as opposed to partial Medicaid. This suggests that ACA Medicaid expansion is causing the least resourced individuals to be more likely to take up dual (non-ACA) Medicaid, as eligibility for full dual Medicaid requires lower income or assets than for partial coverage.

We show that the increase in LIS enrollment is slightly smaller than the increase in dual Medicaid participation; LIS participation increases by eight percentage points whereas dual Medicaid participation increased by nine percentage points. Because the detailed information available in administrative claims allows us to differentiate between voluntary and auto enrollment, we are able to demonstrate that this disparity is because some individuals who are now automatically enrolled in LIS, would have otherwise actively applied, in the absence of supplemental Medicaid. That is, the eight-percentage-point increase in LIS enrollment is the net effect of a ten-percentage point increase in automatic enrollment through dual Medicaid and a two-percentage-point reduction in active enrollment for those who applied for LIS but did not have dual Medicaid. There is also a smaller (4.5 percentage point) increase in Medicare Part D enrollment, which is entirely driven by increased automatic enrollment in the LIS. We observe statistically significant differences in enrollment in Part D for Blacks and whites that are consistent with increased LIS enrollment corresponding to new prescription drug coverage for Black beneficiaries and more generous, but not new, prescription drug coverage for white beneficiaries; we find no other differences by race. In addition, we provide new evidence on how this increased coverage impacted health care utilization and spending for those enrolled in TM or Medicare Part D. The changes in spending and utilization are consistent with responses to more generous insurance coverage. We also

[5] Our finding is also larger than that in contemporaneous work (Barkowski et al., 2022) that also uses the Medicare claims data. We believe these differences are due to the concentration of eligible individuals in our respective samples. This paper focuses on the bottom decile of zip codes by income whereas Barkowski et al. (2022) include zip codes up to the median income and median poverty level. Our estimated effect size falls when we estimate effects at higher deciles of income and the confidence intervals around these estimates suggest we would not be able to rule out an effect the size of their estimate (four percentage points) in the bottom half of zip codes by income (Figure 4).

investigate spillovers to MA enrollment but find inconclusive results due to some possible differential pre-period trends.

This paper makes three key contributions to the economics literature. First, we provide evidence on new channels for longitudinal spillovers which influence the take-up of social insurance. We find that public health insurance expansions for people just prior to age-based eligibility for Medicare affect their enrollment in several complementary means-tested benefits at the time of Medicare eligibility. Our results point to an important role for information about and experience in public benefits enrollment. The setting we study is particularly important since dual Medicaid and the LIS have take-up rates that are among the lowest of social programs in the U.S. (Ungaro and Federman, 2009; Pezzin and Kasper, 2002; Caswell and Waidmann, 2017, NCOA, 2020), have high costs of applying, but confer substantial financial benefits to participants (Roberts et al., 2021; SSA 2024).[6] As more states adopt the ACA expansion, and more Baby Boomers residing in expansion states age into Medicare, our results suggest dual Medicaid enrollment may increase further.

Second, we contribute to the literature on the role of defaults or automatic enrollment on program participation. Throughout the U.S. social safety net, there are several instances of enrollment in one program automatically conferring enrollment in another program; for example, in some states Supplemental Security Income (SSI) participation confers eligibility for Medicaid or Supplemental Nutrition Assistance Program (SNAP) benefits (see Ambegaokar et al., 2017).[7] Prior work shows that

---

[6] In addition to documenting income and assets, information and application costs are so high for these programs because although they both provide types of health insurance, they require applications to separate agencies. Individuals apply for the LIS through the Social Security Administration (SSA), which is where they enroll in Medicare, but they apply for dual Medicaid through their state Department of Human Services. Enrollment in Medicare Part D and Medicare Advantage is not handled by SSA or state Department of Human Services office, but through medicare.gov. Social Security Administration. "Sign Up for Medicare." https://www.ssa.gov/medicare/sign-up. Viewed June 5, 2024. Social Security Administration. "Apply for Medicare Part D Extra Help Program." https://www.ssa.gov/medicare/part-d-extra-help. Viewed June 5, 2024. Medicaid.gov "Where Can People Get Help with Medicaid & CHIP?" https://www.medicaid.gov/about-us/where-can-people-get-help-medicaid-chip/index.html#statemenu. Viewed June 5, 2024.

[7] In addition, in some states enrollment in SNAP, Temporary Assistance for Needy Families (TANF), the National School Lunch Program (NSLP), or Women Infant and Children's (WIC) food program confers Medicaid or Children's Health Insurance Program (CHIP) enrollment for children (Ambegaokar et al., 2017).

overall participation in the receiving program is higher when there is automatic enrollment (e.g., Rennane and Dick, 2023; Rennane et al., 2023; Rupp and Riley, 2016; Blavin et al., 2014; Jones et al., 2022). However, when enrollment in the conferring program increases, enrollment in the other program might not increase by the same amount if individuals can also directly apply for that second program or there are administrative errors in linking the two. We provide what we believe to be the first evidence that directly compares how enrollment in one program increases following a plausibly exogenous increase in participation in a conferring program.

Finally, our paper provides new information about the characteristics of the 65-year-old Medicare beneficiaries at the margin of dually enrolling in Medicare and Medicaid. There is an increasing focus in public economics on understanding who is targeted by interventions intended to increase enrollment in public benefits (e.g., Finkelstein and Notowidigdo, 2019). Prior work has shown that among adults ages 18 to 64, marginal enrollees in subsidized health insurance are younger and healthier (e.g., McIntyre et al., 2021; Domurat et al., 2021; Shepard and Wagner, 2022) but poorer (e.g., Shepard and Wagner, 2022). Our study provides evidence of the extent to which spillovers impact different types of Medicare enrollees. As we can observe in the Medicare administrative data whether the marginal enrollee participates in full or partial Medicaid, this conveys information about income and asset levels of the marginal enrollee because full Medicaid is only available to individuals with the lowest income and assets. To our knowledge, this is the first paper to describe which older adults are more likely to dually enroll in Medicare and Medicaid following ACA Medicaid expansion.

Our study of spillover effects in enrollment from ACA expansion coverage to Medicare enrollment choices at age 65 has important implications for policy. We document that spillovers are an important channel for increasing take-up of publicly subsidized benefits, likely because they reduce the administrative barriers to subsequent enrollment. In the case we study, the spillover effects appear to be well targeted in the sense that they increase enrollment in the publicly subsidized benefit among those with the lowest incomes, as measured by full-benefit dual status. Finally, the results provide evidence that enrollment spillovers create longer term fiscal implications for, in this case, federal and state governments. While the direct effects of increasing enrollment among low-income adults through Medicaid expansion are well documented, our study identifies additional channels for fiscal impacts. These channels include greater future take-up of publicly subsidized benefits, comprising Medicaid supplemental coverage and the LIS, as well as increase used of Medicare-financed services due to the effects of greater supplemental insurance coverage on health care use.

2. Background

In this section, we provide an overview of the health insurance choices available to low-income older adults prior to and upon reaching age-based eligibility for Medicare at age 65, and we discuss how increased access to expansion Medicaid prior to age 65 may affect choices at age 65.

2.a. Enrolling in Expansion Medicaid Coverage at Age 64 in an Expansion State

In states expanding Medicaid through the ACA, expansion coverage is available to adults with income less than 138% of the federal poverty level. People who enroll in expansion Medicaid coverage often begin by applying through the ACA marketplace website or the department of human services in their state. Applicants are asked to self-report their income (there is no asset test for these expansion Medicaid applicants), and for most, income eligibility is determined using an electronic data match (i.e., the applicant is not required to provide the documentation). States may not charge premiums to those with income below 150% FPL, and, as of March 2020, only 22 states charged any cost-sharing to any expansion enrollees and, among those with cost sharing, amounts are modest (Kaiser Family Foundation, 2020). The vast majority of people enrolled in expansion coverage receive their benefits through a managed care plan.[8] And, while the benefit package for expansion coverage is determined by the state, in

[8] Among the 32 states that responded to the KFF Survey of Medicaid Officials and had implemented the ACA expansion, 28 reported that over 75 percent of the adult expansion population was enrolled in Medicaid managed care. https://www.kff.org/medicaid/state-indicator/managed-care-penetration-rates-by-eligibility-

all states, expansion Medicaid includes prescription drug coverage. Thus, for 64-year-olds with low income, experience with expansion Medicaid included prescription drug coverage.

2.b. Insurance choices at age of Medicare eligibility

Most people in the U.S. become eligible for Medicare at age 65 and enroll in coverage for hospitalization and outpatient services through Medicare Parts A and B, largely because enrollment in Part A for those receiving Social Security benefits is automatic (Remler and Glied, 2003). All Medicare beneficiaries, regardless of their income and assets, may choose between MA and traditional Medicare and whether to enroll in Medicare Part D for prescription drug coverage. Medicare beneficiaries may also be eligible for dual Medicaid supplemental or wrap-around coverage, but eligibility is based on income and asset criteria and enrollment is not automatic. There are two types of dual Medicaid (full and partial) for Medicare enrollees. Full Medicaid pays for all Medicare premiums and cost sharing and also covers additional services at state option (e.g., vision, dental, and long-term care). Full Medicaid is available to Medicare enrollees with the lowest income and assets (varies across states, but in most states is tied to Supplemental Security Income (SSI) eligibility criteria of income below 74% of the poverty level and assets below $2,000 (single)/$3,000 (couple)).[9] Partial Medicaid is available to Medicare enrollees with somewhat higher levels of income and assets and covers some or all of Medicare premiums and cost sharing. Applications for full Medicaid are lengthier than those for partial and applicants must provide documentation of their income and assets. Applications for partial Medicaid are shorter and some states allow applicants to self-attest their income and assets without providing documentation (Glaun, 2002; Tiedemann and Fox, 2005). Partial Medicaid is available to Medicare beneficiaries with somewhat higher income and assets. While thresholds vary across states, in most states, people with income up to 135% of

group/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D#note-1. Viewed December 18, 2023.

[9] Kaiser Family Foundation. 2022. "Medicaid Eligibility Through the Aged, Blind, Disabled Pathway." https://www.kff.org/medicaid/state-indicator/medicaid-eligibility-through-the-aged-blind-disabled-pathway/?currentTimeframe=0. Viewed March 4, 2024.

the federal poverty level and assets below $9,090 (single)/$13,630 (couple) are eligible.[10] Beneficiaries dually enrolled in Medicare and full Medicaid save an estimated $2,288 in out-of-pocket costs every two years (Roberts et al., 2021), use less outpatient care (Roberts et al., 2021), and use more dental care (Roberts et al., 2022) relative to those enrolled only in Medicare.

Medicare beneficiaries are also eligible for publicly subsidized prescription drug coverage through Medicare Part D, and beneficiaries with low income (<150% of FPL) and assets (up to $15,510 for individuals/$30,950 for couples in 2022) are eligible for the LIS; one third of Medicare beneficiaries meet this income requirement (Roberts, 2024).[11,12] In contrast to eligibility for dual Medicaid, which is determined by states, eligibility for the LIS is set nationally. Because the LIS income and asset thresholds are generally higher than those for dual Medicaid, most Medicare beneficiaries who are eligible for dual Medicaid are also eligible for the LIS. Thus, CMS automatically enrolls those with either full or partial Medicaid coverage in the LIS and Medicare Part D. Most (65%) LIS participants were auto-enrolled (Shoemaker et al., 2012) and therefore also automatically enrolled in a default Part D plan. Some Medicare beneficiaries, however, are eligible for the LIS but not for dual Medicaid and these beneficiaries must actively enroll in Medicare Part D (and then LIS, if eligible) and select a plan.[13] Those who need to actively enroll in the LIS must complete a three-page application that is processed by the Social Security Administration (SSA). The SSA estimates that LIS participation can save enrollees $5,900 per year (SSA, 2024). Research shows that LIS participation improves prescription drug adherence (e.g., Fung et al., 2024) and makes individuals more likely to initiate and fill prescriptions for high-priced specialty drugs (Dusetzina et al., 2022; Glynn et al., 2022; Stuart et al., 2012; Yala et al., 2014).

---

[10] MACPAC. 2024. Data Book: Beneficiaries Dually Eligible for Medicare and Medicaid. https://www.macpac.gov/publication/data-book-beneficiaries-dually-eligible-for-medicare-and-medicaid-3/. Viewed March 4, 2024.

[11] Social Security Administration. 2024. Understanding the *Extra Help* with Your Medicare Prescription Drug Plan. https://www.ssa.gov/pubs/EN-05-10508.pdf. Viewed March 4, 2024.

[12] 80.5 percent of Medicare enrollees participate in Part D; 34.5% enroll in a standalone Part D plan and 46% in a MA-Part D plan. Center for Medicare Medicaid Services. 2024. Medicare Enrollment Dashboard for January 2024. https://data.cms.gov/tools/medicare-enrollment-dashboard. Viewed May 6, 2024.

[13] 52% of the total eligible population for the LIS were "automatically eligible" in 2014 (Popham et al., 2020).

2.c. Effects of Expansion Medicaid Coverage under age 65 on Insurance Choices at age 65

In this section, we describe how access to expansion Medicaid as primary coverage before the age of Medicare eligibility may affect Medicare-related insurance choices at age 65. We hypothesize that this may occur through two possible channels. The first is through its effect on administrative burdens. Because beneficiaries have greater information about the availability of and how to enroll in public programs, those exposed to expansion Medicaid prior to becoming eligible for Medicare may be better prepared to navigate publicly funded health insurance benefits and overcome administrative burdens when they reach age 65. Increased enrollment in dual Medicaid directly lowers LIS administrative burdens because LIS is then automatically turned on. The second channel is that people newly gaining expansion Medicaid prior to age 65 may find their experience being insured increases their demand for additional coverage at age 65 beyond what Medicare alone covers. In the following sections we discuss how these channels may affect the types of health insurance choices people make at age 65, although we emphasize that our analysis will not necessarily allow us to disentangle the importance of each channel.

Dual Medicaid supplementing Medicare. In addition to increasing demand for health insurance by making individuals more aware of the benefits of dual Medicaid coverage, prior experience with expansion Medicaid may also increase enrollment in dual Medicaid coverage by making individuals more aware of how to successfully complete an application for coverage. Enrollment in expansion Medicaid prior to age 65 does not automatically translate into supplemental coverage through dual Medicaid at age 65 because the eligibility criteria differ between the two programs and people must reapply using a new application. Expansion Medicaid does not include an asset test and is available to non-elderly (and non-disabled) individuals with income up to 138% FPL. In most states, full and partial post-65 dual Medicaid benefit programs impose asset tests and full Medicaid is available to applicants with income no higher than 74-100% FPL and partial Medicaid is available to applicants with income up to 135% FPL.[14] Thus,

[14] MACPAC. 2024. "Data Book: Beneficiaries Dually Eligible for Medicare and Medicaid." https://www.medpac.gov/wp-content/uploads/2024/01/Jan24_MedPAC_MACPAC_DualsDataBook-508_SEC.pdf. Viewed May 23, 2024.

due to assets exceeding the asset limit or income above 135% FPL, not every individual who was eligible for expansion Medicaid will necessarily qualify for dual Medicaid enrollment. In addition to within-person spillovers, we expect that cross-person spillovers also increased dual Medicaid enrollment, given that dual enrollment increased after Medicaid expansion even for those who were too old to directly benefit from the ACA expansion (McInerney et al., 2021). In other words, even people who did not qualify or enroll in expansion Medicaid prior to age 65 in expansion states may be more likely to enroll in dual Medicaid supplementing Medicare after the ACA Medicaid expansion in their state, perhaps due to greater Medicaid public health messaging and outreach. We predict that 65-year-olds will apply for the most generous dual Medicaid they are eligible for and that enrollment in both full and partial Medicaid will increase.

Medicare Part D and the LIS. Because Medicare beneficiaries enrolled in dual Medicaid (full or partial) are automatically enrolled in Part D and the LIS, any increases in dual status resulting from expansion Medicaid prior to age 65 may increase enrollment in Part D and the LIS, particularly for people who would not have enrolled in those programs prior to Medicaid expansion. For those not dually enrolled in Medicaid and Medicare, active enrollment in either Part D alone or Part D plus LIS might also increase through greater experience navigating public programs. In addition, expansion Medicaid increased the use of prescription drugs among those enrolling in coverage (Ghosh et al., 2019), and prior use of prescription drugs at younger ages may increase demand for prescription drugs and prescription drug insurance at age 65, leading lower-income older adults to more actively seek Part D coverage and the LIS to help pay for their prescriptions.

Medicare Advantage. It is theoretically ambiguous whether participating in expansion Medicaid at age 64 will increase or decrease MA enrollment. Because dual Medicaid can serve as a substitute for Medicare Advantage, particularly in its role in reducing cost sharing for covered services, people with low income who would have enrolled in Medicare Advantage due to its lower cost sharing may instead retain traditional Medicare coverage combined with dual Medicaid. However, the proportion of duals enrolled in MA increased substantially between 2011 and 2021 with the introduction of MA plans directly targeted to dual enrollees suggesting that the two types of coverage are increasingly viewed as complements (Urban Institute, 2024). But greater familiarity with expansion Medicaid managed care prior to age 65 could either encourage or discourage enrollment in Medicare Advantage at age 65 depending on whether that prior experience was positive or negative.

We will empirically test hypotheses related to spillovers of program exposure by examining whether the ACA Medicaid expansion impacted 65-year old insurance enrollment (i.e., any dual Medicaid, full Medicaid, partial Medicaid, Medicare Advantage, Medicare Part D, and the LIS, distinguishing between automatic and active enrollment). Based on evidence indicating that the ACA expansion differentially benefited low-income adults based on race and ethnicity and that growth in enrollment in Medicare Advantage after the implementation of the ACA has been greater among racial and ethnic minorities (Meyers et al., 2021), we also examine heterogeneous effects by these individual characteristics. We also provide evidence on the effect of the expansion on measures of utilization and spending in traditional Medicare and Part D based on evidence that changes in health insurance coverage affect the use of health care services. Because we face some data limitations in analyzing utilization effects, we discuss their interpretation when reviewing our findings.

3. Data and Methods

3.a. Data

Our primary data source is the 100% Medicare claims from 2010 to 2017. We use the Master Beneficiary Summary File (MBSF), which includes information on beneficiary age, geographic location, and Medicare enrollment (including enrollment in Parts A, B, and D; Medicare Advantage (MA); full or partial dual Medicaid; and the Low-Income Subsidy (LIS)). We also use the cost and utilization segment of the MBSF, which includes summary measures of annual health care spending and utilization for traditional Medicare and Part D.

In our main analyses, we focus on people newly age-eligible for Medicare; that is, we restrict the claims data to beneficiaries who are 65 years old and became eligible for Medicare due to age. In order to better isolate the within-person spillovers that are the focus of our analysis, we omit claims from the year 2014 (and only use other years 2010-2017) from our main difference-in-differences results because 65-year-olds in 2014 were not exposed to expansion Medicaid but may have benefited from some of the other across-person spillovers described above. To follow a set of states consistently over time and avoid statistical complexities of differential treatment timing, we exclude beneficiaries residing in states that expanded Medicaid between 2015 and 2017 (Alaska, Indiana, Louisiana, Montana, and Pennsylvania), limiting our comparison to states that either did not expand before 2017, or expanded in 2014 (Goodman-Bacon 2021). We also present results of a robustness check in which we exclude states that expanded Medicaid prior to 2014: Delaware, the District of Columbia, Massachusetts, New York, and Vermont.

Since Medicare claims data do not include measures of income or educational attainment—two socio-demographic characteristics often used to identify those who are likely eligible for Medicaid—we instead proxy for individual income with a measure of average income in an enrollee's residential zip code. Specifically, we construct the average adjusted gross income in the year 2013 in an enrollee's residential zip code using Statistics of Income (SOI) data from the Internal Revenue Service (IRS 2022). The SOI data reports the number of returns filed and total adjusted gross income in each zip code in the US, allowing us to calculate the average adjusted gross income in the zip code. We restrict our analysis sample to Medicare beneficiaries residing in zip codes with average income in the bottom decile of zip codes, to focus on groups who were likely eligible for expansion Medicaid before age 65. We select zip codes at the lowest average incomes until we account for 10 percent of tax returns filed in 2013 (rather than just pick the poorest 10% of zip codes, which could represent more or less than 10% of the US population).

We measure outcomes based on the annual summary variables in the MBSF. Because people usually enroll in Medicare based on the date they turn age 65 and the outcomes of interest in the MBSF are measured by calendar year, people in our dataset have varying observation period lengths, ranging from 1 to 12 months. For example, a beneficiary who turns 65 in January would have 12 months of Medicare coverage in their first year whereas a beneficiary born in November would only have two months. Our insurance coverage measures reflect whether the beneficiary was ever enrolled during the observation period. For measures of spending and utilization, we construct monthly measures by dividing the utilization for the full observation period by the number of months of traditional Medicare or Part D coverage during the observation period, assuming 30 days in a month.

We first examine whether the ACA expansion led to changes in the likelihood of any dual Medicaid supplemental coverage and also estimate separate models for any full Medicaid coverage (including people who had partial Medicaid coverage at some point), and any partial Medicaid coverage (but no full Medicaid coverage).[15] We then examine whether beneficiaries were enrolled in Medicare Advantage, Medicare Part D, and the LIS during the calendar year. For enrollment in the LIS, we estimate separate models differentiating between automatic (for those enrolled in dual Medicaid) and active enrollment.[16]

We next turn to measures of health care spending and utilization for traditional Medicare and Part D prescription drugs. We examine total monthly spending, monthly Medicare spending, and monthly non-Medicare spending. For traditional Medicare, this measure of non-Medicare spending includes beneficiary out-of-pocket spending as well as spending by insurers other than Medicare; for Part D, monthly non-Medicare spending reflects monthly beneficiary out-of-pocket spending. We examine these

---

[15] Partial Medicaid includes enrollees in the Qualified Medicare Beneficiary (QMB) program, the Specified Low-Income Medicare Beneficiary (SLMB) program, and the Qualifying Individuals (QI) program who do not have full Medicaid.

[16] We identify automatic LIS enrollment for those "deemed eligible" (codes 01, 02, 03) in the monthly cost sharing group variable.

spending measures and monthly utilization measures for inpatient and outpatient care as well as the number of 30-day fills for Medicare Part D.

3.b. Empirical Model

We use a difference-in-differences model to examine the impact of ACA expansion policy exposure prior to age 65 on insurance decisions, healthcare spending, and utilization at age 65. We compare newly age-eligible beneficiaries in states with and without ACA Medicaid expansions through specification (1). We estimate difference-in-difference models of the following form, where the year 2014 is omitted and the post period begins in 2015, the first year that 65-year-olds entering Medicare could have been exposed to expansion Medicaid prior to age 65:

$$(1)\ \ Y_{i,s,t} = \beta_0 + \beta_1 \times Expansion_s \times (Year \geq 2015)_t + \Gamma X_{i,s,t} + \lambda_s + \lambda_t + \varepsilon_{i,s,t}.$$

To test whether the trends in outcomes prior to the expansion were parallel in expansion and non-expansion states and to observe how the effects evolve over time, we estimate event studies of the following form:

$$(2)\ Y_{i,s,t} = \beta_0 + \sum_{t=2010, t\neq 2013}^{2017} \beta_t \times Expansion_s \times (Year = t)_t + \Gamma X_{i,s,t} + \lambda_s + \lambda_t + \varepsilon_{i,s,t}.$$

where Y is a measure of type of insurance, utilization, or spending, which varies across individuals (i), states (s), and year (t). For all outcomes, *Y* measures the variable of interest for the individual's first year of enrollment in Medicare. *Expansion* is an indicator of state expansion status and *Year* is a dummy variable indicating the year of observation. In the event study specification, the omitted year is 2013, the year prior to expansion to adults ages 19-64 for the states in our analysis, as trends are judged relative to that year. Though 2014 was omitted from the difference in differences analysis because 2015 is the first year a 65-year-old could have had exposure to expansion Medicaid, the event study results include 2014 to illustrate how the effects evolve over time. The coefficients β_t represent the effect of being in an expansion state relative to a non-expansion state in the indicated year. We include year fixed effects, state fixed effects, and individual controls for race (non-Hispanic Black, Hispanic, Asian, Native American, other race, and unknown race, the omitted category is non-Hispanic white) and sex. Standard errors are clustered by state, the level at which the policy variation occurs.

4. Results

4.a. Study sample characteristics

We first present summary statistics for individual characteristics and study outcomes for 65-year-old beneficiaries in all states and all zip codes (Table 1, column (1)). In our main analysis, we exclude residents in the five states that expanded Medicaid between 2015 and 2017, which corresponds to 1.5 million 65-year-old Medicare beneficiaries and in column (2) we present mean characteristics for beneficiaries residing in the states included in our analysis. In column (3), we present mean characteristics for beneficiaries in the low-income zip codes which are the focus of our analysis, the "insurance sample." Among all zip codes, average adjusted gross income (AGI) is approximately $65,000. When we restrict the sample to zip codes in the bottom decile, average AGI is approximately $30,000. We also note that our sample of Medicare beneficiaries in low-income zip codes is disproportionately Black and Hispanic relative to white, and these zip codes are disproportionately located in the south.

Unsurprisingly, column (3) shows that a larger share of Medicare beneficiaries in low income vs. higher income zip codes are dually enrolled in Medicaid (24% vs. 9%), especially in full Medicaid (20% vs. 7%).[17] A higher share of Medicare beneficiaries in low-income zip codes are enrolled in the LIS (27% versus 10%).The remaining columns present means for the samples used to analyze spending and utilization in TM (column (4)) and Part D (column (5)). Most are similar to column (3), however, a higher share of the beneficiaries in the Part D sample are enrolled in dual Medicaid, MA, and the LIS than in the overall insurance sample.

[17] When considering a point in time, our descriptive statistics match prior publications showing that nationally, 70% of duals are in full Medicaid and 30% are in partial Medicaid. For our analysis, we assign "full" status to any enrollee who had at least one month of full Medicaid during the calendar year.

In Appendix Tables 1 through 3, we present the results of balance tests in which we compare beneficiaries residing in low-income zip codes in expansion and non-expansion states in the pre period prior to any expansion. We examine these separately for the sample used to analyze insurance outcomes, traditional Medicare spending and utilization, and Part D spending and utilization. Many of the differences are statistically significant due to the large sample size; we highlight those differences that are also economically meaningful. Enrollees in expansion states are more likely to be Hispanic or Asian and are less likely to be white or Black. Expansion state residents are more likely to be enrolled in dual Medicaid and the LIS in the years before the expansion.[18] Given that state expansion decisions were not random and that there are known demographic differences across the states, these differences are not surprising. The difference-in-differences identifying assumptions do not require balance on population characteristics, but it is useful to observe and keep in mind these differences in the demographic composition of states.

4b. Insurance outcomes

In Table 2, we present the difference-in-differences results from equation 1 concerning the effect of the ACA Medicaid expansion on insurance for inpatient, outpatient, and physician services (as opposed to prescription drug coverage). In columns (1) through (5), we consider the effect of the ACA Medicaid expansion on dual enrollment in Medicare and Medicaid. We first consider any dual enrollment in Medicare and Medicaid (i.e., full or partial), which is what prior evidence from survey data was able to measure. We observe a nine-percentage point increase in the likelihood of dual enrollment in Medicare and Medicaid (column (1)). This is a 36 percent increase from the pre-period mean dual Medicaid enrollment in these low-income zip codes.

This estimated effect of ACA exposure to dual Medicaid enrollment is sizable, although we expected to find a relatively large estimate for several reasons. First, this estimate reflects both the within-

[18] In Appendix A, we address whether the ACA expansion-induced reduction in mortality estimated in previous work is likely to impact our sample composition. We show that the demographic transition of the baby boomers aging on to Medicare overwhelms the number of lives saved by the ACA expansion.

person spillovers from prior exposure to expansion Medicaid and across-person spillovers that might generally arise from the expansion. We also expect that our focus on Medicare beneficiaries residing in low-income zip codes amplifies the across-person spillovers because of neighborhood or peer effects (e.g., Grossman and Khalil, 2020; Furtado and Theodoropoulos, 2013; Figlio, Hamersma, and Roth, 2015). Finally, we note that administrative measures of Medicaid participation—such as those we derive from the Medicare claims data—do not suffer from the undercount prevalent in self-reports from many major household surveys (e.g., Call et al., 2013; Davern et al., 2009; Noon et al., 2018; Mellor et al., 2021). This is especially noteworthy given that Boudreaux et al. (2019) found that the Medicaid undercount grew in expansion states post-expansion in the American Community Survey (ACS). Overall, the magnitude we find is economically very meaningful given the importance of increasing take-up of undersubscribed social benefits.

In column (2), we provide the first evidence that this increase in dual Medicare and Medicaid enrollment is entirely driven by new enrollment in full, not partial Medicaid. As shown in column (3), there is no change in the likelihood of enrollment in partial Medicaid. Understanding this distinction is important for both the policy context and for learning which 65-year-olds are on the margin of dually enrolling in Medicare and Medicaid. Full Medicaid often covers important services that Medicare does not, such as vision or dental benefits, whereas partial Medicaid covers premiums for Medicare and, in many cases, cost-sharing for Medicare-covered services, so the additional dual coverage generated through the ACA Medicaid expansion is likely particularly generous (Pena et al., 2023). Since the income and asset eligibility criteria for full Medicaid are lower than the criteria for partial Medicaid, this shows that the 65-year-old Medicare beneficiaries with the lowest income and fewest resources are those who are induced to dually enroll.

That the marginal enrollee in dual coverage is a "full" dual may be somewhat surprising since the application is much easier for partial than for full Medicaid, so we might expect that if there are an equal number of people who are eligible but not enrolled in partial as in full Medicaid the "Medicaid expansion" effect would be larger for partial. However, the disproportionate take-up of full benefit

Medicaid may be driven by a greater portion of people eligible for (but not enrolled in) dual Medicaid being eligible for full benefit coverage. To investigate this, we examined publicly available data from the Health and Retirement Study (HRS) data, a longitudinal survey with detailed information on income and assets. We calculated what share of respondents with income below 138% FPL at age 64 (the income criteria for ACA expansion Medicaid) would have met the eligibility criteria for partial (but not full) Medicaid at age 65. Individuals who had income below 138% FPL at age 64 were twice as likely to meet the income and asset criteria for full Medicaid than partial (but not full) when they reached Medicare age, suggesting that our otherwise surprising finding is indeed likely to be driven by the larger number of individuals who are eligible for full rather than partial Medicaid.[19]

Event study results for the primary outcomes of dual Medicaid, full Medicaid, and partial Medicaid are in Figures 1-3. For all of the outcomes except for enrollment in partial Medicaid (which does not change following the ACA Medicaid expansion), the effect becomes larger in magnitude two years post-expansion and then remains roughly constant. This may reflect the effect being larger for individuals with more years of exposure to the ACA Medicaid expansion because 65-year-olds in 2015 only had one year of exposure whereas 65-year-olds in 2016 and 2017 had two and three years, respectively. In addition, we see little evidence of differential pre-trends for these outcomes. In Figure 4, we show how the main difference-in-differences coefficient for full Medicaid changes throughout the income distribution. We find that the magnitude of the effect declines throughout the income distribution with the largest effect in the lowest income decile, providing evidence that our approach of restricting our analysis to the lowest income decile captures those most likely eligible for dual Medicaid.

In columns (4) and (5) of Table 2, we examine whether our resulting increased Medicaid dual enrollment is reflected in both traditional Medicare and MA; our priors are that there could be greater

[19] Since the publicly available HRS data do not include state codes and there are some state differences in income and asset eligibility limits for older adults, we proxy for full Medicaid eligibility with the income and asset limits for SSI (as is done in 23 states) and for partial (not full) Medicaid eligibility we use the income and asset levels set by the federal government for the Specified Low-Income Medicare Beneficiary (SLMB) program and in place in 32 states. With these assumptions, we exclude some who are eligible in their state but have income above the SSI limit and below 100% FPL limit who might be eligible for full Medicaid.

enrollment in either type of Medicare. The estimates show that there is increased dual enrollment in both traditional Medicare (6 percentage points, column (4)) and MA (3 percentage points, column (5)).

We next examine the impact on a related but different outcome—MA enrollment (regardless of dual Medicaid status). In column (6) of Table 2, we observe a 3 percentage point reduction in MA enrollment among 65-year-olds in ACA expansion states relative to those in non-expansion states. As shown in Appendix Figure 1, MA enrollment is increasing in both sets of states over this time period but growing more slowly in ACA expansion states, a trend that begins prior to the ACA expansion in 2014 and, in Figure 5, we see some evidence of differential pre-trends in this outcome. Our robustness testing section (next) leads us to conclude that this result is challenging to defend as causal for additional reasons. Whereas all other primary insurance outcomes are attenuated to close to zero at higher deciles of zip code income (Figure 4, Appendix Figures 3-4), enrollment in MA remains meaningfully (approximately three percentage points) lower in expansion states after 2014 throughout the distribution of income (see Appendix Figure 5). We interpret this to mean that our estimates of the effect of the ACA expansion on MA enrollment may have been influenced by broader trends in MA enrollment that coincided with but were not caused by the ACA expansion. In columns (7) and (8) of Table 2, we report the estimate of the effect of expansion on MA where we split the sample by whether the state had no or some enrollment in managed care organizations (MCOs). Most states had some Medicaid MCO for enrollees under age 65, but the reduction in MA enrollment is larger in magnitude in states with no MCO enrollment before age 65. This would be consistent with prior positive experience with Medicaid MCO making 65-year-olds more likely to enroll in a MA plan than 65-year-olds who only had exposure to fee for service Medicaid. However, we acknowledge these results are less conclusive due to the evidence discussed above on concerns about interpreting the MA estimate causally.

In Table 3, we examine enrollment in insurance outcomes related to Part D prescription drug coverage. We observe a 4.5 percentage point increase in the likelihood of Part D enrollment, which is a nine percent increase from the pre period mean of 53 percent of residents in low-income zip codes enrolled in Part D. In columns (2) through (4) of Table 3, we consider participation in the LIS. We find what we believe to be the first evidence that the ACA Medicaid expansion increased enrollment in the LIS. As shown in column (2), overall, participation in the LIS increased by eight percentage points (28 percent). This is the net effect of a ten-percentage point increase in automatic LIS enrollment for those receiving dual Medicaid (column 3) and a two-percentage point reduction in the likelihood of active enrollment (column 4) in the LIS as a non-dual. The corresponding event study results are presented in Figures 6-9. As with the dual Medicaid and MA results, the effect becomes larger two years after the expansion and then remains constant; here too, we see little evidence of differential pre-trends. Appendix Figures 6-9 present the difference in difference coefficient estimates across the distribution of income, and, as expected, the magnitude of the effect for enrollment in Part D, any LIS, and automatic LIS are attenuated at higher levels of income.

4.c. Race and insurance outcomes

We next examine whether the ACA expansion had differential effects on Medicare enrollment by race and ethnicity. Since Blacks and Hispanics experienced larger coverage gains in the ACA expansions than non-Hispanic whites, it is possible that these spillover effects are larger for these groups. We focus on white and Black Medicare beneficiaries in order to have a sufficiently large number of observations.[20] For the outcomes reflecting dual Medicaid enrollment, the effect of the ACA expansion has similar magnitude for both white and Black Medicare beneficiaries (Figure 10), though Black beneficiaries have higher mean participation.

When we examined participation in Part D by race/ethnicity, as shown in Figure 10, we found fairly large differential impacts. The estimate of the effect of ACA expansion on Part D enrollment for whites is relatively small and not statistically significant. For Blacks, in contrast, ACA expansion was associated with a 7.2 percentage point (or 15 percent) increase in enrollment in Part D. However, the

[20] We also separately estimated the effects for Hispanic beneficiaries, but these estimates did not satisfy the parallel trends assumption for several of the key outcomes (i.e., any dual Medicaid enrollment, Part D enrollment, any LIS enrollment, automatic LIS enrollment), so we interpret the effects for Hispanic beneficiaries as the continuation of a pre period trend of increased enrollment rather than a causal effect.

coefficient estimates for the LIS outcomes are similar for the two groups, suggesting that the increased LIS enrollment corresponded to new Part D coverage for Black beneficiaries and more generous but not new Part D coverage for white beneficiaries.

4.d. Spending and Utilization

Insurance coverage changes are expected to affect healthcare use and out of pocket spending, because of the impact that reducing cost sharing would have on these outcomes. We next consider changes in spending and utilization among traditional Medicare beneficiaries, separately for inpatient and outpatient care. Because of the more serious nature of health events that require inpatient vs. outpatient healthcare, we expect that beneficiaries may be more price elastic in the demand for outpatient care (e.g., Aron-Dine et al., 2013). As shown in Appendix Table 2, only one in 20 enrollees in traditional Medicaid (TM) has an inpatient stay in any given month but half (50 percent) have an outpatient encounter each month. Those with outpatient encounters average nearly four per month. Table 4 shows no change in inpatient spending among those in TM, but a 13 percent increase in spending on outpatient care. Results are similar for TM utilization, as shown in Table 5. There is no change in inpatient care but a three percentage point increase (5.6%) in the likelihood of receiving any outpatient care in a month.

In Panel C of Tables 4 and 5, we consider spending and utilization in Part D. As shown in Appendix Table 3, 77 percent of enrollees have any prescription fills and the average Part D enrollee has 3.82 30-day fills per month. Panel C of Table 4 presents the difference-in-differences coefficients of the effect of ACA Medicaid expansion on Part D spending outcomes. There is no change in total spending (column (1)), which obscures an increase in Medicare spending (column (2)) and a decrease in beneficiary out-of-pocket beneficiary spending (column (3)). Because they have different baseline means, the percentage changes do not perfectly offset one another. But from the pre-treatment mean they reflect an $11.77 per month increase in Medicare spending and a $9.96 reduction in beneficiary out-of-pocket spending. This likely reflects the increased participation in the LIS driven by the ACA.

In Panel C of Table 5 we examine Part D utilization. We note that there is not much of an impact on utilization. As shown in column 1, there is a five percent reduction in the number of 30-day fills (or a 0.15 reduction in the number of 30-day fills). This corresponds to about one fewer fill for every seven people, and most Medicare beneficiaries have nearly three 30-day fills. There is no change in the likelihood of having a 30-day fill ($p>0.05$) and only a 2.7 percent reduction in the number of 30-day fills among those who have any. Since spending stayed the same and the number of fills fell modestly, it is possible that some beneficiaries are receiving fewer, higher priced prescriptions. Together, the results in Tables 4 and 5 suggest that although overall Part D drug spending per beneficiary remained constant and there was little change in utilization, there was a shift to the federal government paying more of the cost (and beneficiaries facing fewer out-of-pocket costs).

4e. Robustness checks

Many aspects of our empirical approach are limited by the available data and study variation; thus, we consider a number of robustness checks on our main specifications above.

Because of how our sample is constructed, for beneficiaries born in December, we could only observe one month of Medicare enrollment in the calendar year they turn 65. In contrast, for beneficiaries born in January, we could observe twelve months of Medicare enrollment. It may be the case that beneficiaries with birthdays in December and January or any other month are equally likely to enroll in dual Medicaid and the LIS in the year in which they turn 65, but the expansion led to all new beneficiaries enrolling in these programs sooner (e.g. those born in January enroll in February rather than in April, and those born in November enroll in December rather than February of the next calendar year) because of greater familiarity with Medicaid. Given how our sample is constructed, this might appear as an increase in dual Medicaid enrollment. In Appendix Table 4, we test this by separately estimating the magnitudes for dual Medicaid, Part D, and LIS enrollment among those who we observe in the Medicare claims data for between 7-12 months of Medicare enrollment in the year they turned 65 (e.g., birthday between January and June). If the effects we estimate are merely capturing earlier enrollment, we would expect to find no effect of the ACA expansion on enrollment in these programs for those in Medicare for over half a year (e.g., with birthdays in the first half of the year). In Panel A, we present our baseline results and in Panel B we show the results restricted to those on Medicare for the majority of the calendar year. The coefficient estimates in Panel B are very similar in magnitude to the main sample and lie within the confidence interval of the baseline estimates. Thus, we conclude that these effects largely reflect new enrollment in dual Medicaid, Part D, and LIS.

Our baseline results exclude 2014, the policy year, because some 65-year-olds have experienced only partial year expansions by then. We expect that the effects are smaller when we include the year 2014 in the difference-in-differences estimates because individuals turning 65 years old in 2014 only experienced the within-person spillovers that are a focus of our analysis for the part of the year they were age 64 and eligible for expansion Medicaid. In Panel B of Appendix Table 5, we show that the magnitudes of some of the coefficient point estimates are smaller when we include 2014. However, they fall within the confidence interval of the baseline estimates. We would expect that the effects will be larger when we exclude states that expanded Medicaid to childless adults before 2014 (and may have experienced a smaller boost in enrollment post-2014). In Panel C, we exclude states that expanded Medicaid early (i.e., we exclude Delaware, Washington DC, Massachusetts, New York, and Vermont, as in, for example, Miller and Wherry, 2017 and Ghosh et al., 2019). These states had Medicaid coverage for childless adults prior to 2014. As expected, the coefficient estimates are slightly larger in magnitude than our baseline estimates (though they fall within the 95% confidence interval).

5. **Discussion and Conclusion**

While a large literature examines spillovers in enrollment in public benefits both across people eligible for similar types of benefits and across different types of benefits within an individual, we focus on the extent to which eligibility for public benefits at a given point in time for an individual affects their subsequent enrollment choices. In the context of increased exposure to health insurance before age 65 through the ACA expansion, we find meaningful increases in program participation once adults who were young enough to benefit from the expansion become old enough to receive Medicare. We confirm through large-scale administrative data that there is a large increase in dual Medicaid as a supplement to Medicare and provide the first evidence that this increase entirely reflects enrollment in full, not partial, Medicaid.

Second, we show the importance of automatic enrollment in insurance in a new setting where dual Medicaid confers LIS enrollment. We provide the first evidence of a large eight percentage point (27%) increase in LIS participation. Even though eligible individuals could have always completed the simple, two-page LIS application, most of the expansion-induced LIS participation reflects new enrollment (i.e., LIS automatic participation among individuals who would not have actively applied). There was also a four percentage point increase in Part D enrollment. This provides additional evidence that reducing administrative barriers to enrollment, or implementing automatic enrollment, is an incredibly effective way to increase participation. Prior work has shown that informational nudges increase health insurance enrollment by between 0.3 and 8 percentage points (e.g., Ericson et al., 2017; Bundorf et al., 2019; Domurat et al., 2021; Goldin et al., 2021; Yokum et al., 2022; Ericson et al., 2023),[21] but reducing administrative barriers to enrollment has been shown to increase health insurance enrollment by 11 percentage points more than an information-only intervention (e.g., Ericson et al., 2023).[22,23]

[21] Other work has documented increased participation from informational nudges in SNAP (e.g., Finkelstein and Notowidigdo, 2019); EITC (e.g., Bhargava and Manoli, 2015); and Social Security Disability Insurance (Armour, 2018).

[22] Similarly, effects of interventions that reduce administrative barriers to enrollment are larger than information-only interventions in the context of SNAP (e.g., Finkelstein and Notowidigdo, 2019) and retirement savings (e.g., Choi et al., 2009).

[23] Through the process of applying to participate in one program, applicants may learn of other programs or contact with a human services office might reduce the transaction costs of applying to other programs either through familiarity with the office and the process or if caseworkers assist with the application. Schmidt et al. (2021) interpret their findings of increased SNAP participation arising from the ACA expansion as reflecting one or both of those two channels—increased information or reduced transaction costs.

Third, we show that the marginal 65-year-old dual Medicare-Medicaid enrollee in this context has the lowest income and fewest resources. We can infer this because the entire increase in dual Medicaid participation was in full Medicaid, which has stricter income and asset limits than partial Medicaid. This is similar to the finding that it is the poorest adults ages 18 to 64 who enroll in subsidized health insurance (e.g., Shepard and Wagner, 2022). We also find that new Part D participation is driven by Black beneficiaries. Together, this suggests the new participation arising from the longitudinal spillovers and automatic enrollment targets those who would benefit the most from more generous insurance.

We contribute to an emerging literature that suggests that the effect of earlier exposure to safety net benefits differs by the stage of life at which the individual received benefits. Early exposure to the safety net does not make recipients more likely to receive benefits at older ages (e.g., Guldi et al., forthcoming; Hoynes et al., 2016; Miller and Wherry, 2019), as it may serve a preventive role and lower the need for safety net benefits at later ages. But for adults close to retirement age, exposure to the safety net in one's late working years likely reduces the administrative costs of applying for subsequent safety net benefits and heightens awareness of the benefits of the program (in this setting, public health insurance). Both of these channels are expected to increase safety net participation at later ages.

Overall, our results indicate that traditional Medicare and Part D use and spending increases as a result of new insurance. Of course, one should consider whether results on use and spending in TM arise due to a change in composition of Medicare beneficiaries enrolled in MA or TM, as we found that exposure to insurance before age 65 may cause a slight switch away from MA and towards TM. We do note that this effect is present across ZIP codes of all income levels, so we do not consider this causal, but we nevertheless discuss the interpretation of the use and spending results, were the MA result to be causal. Sample compositional changes would, if anything, point to a decrease in use and spending since MA individuals are healthier than the average traditional Medicare enrollee. Thus, we interpret this increase in outpatient utilization and spending for enrollees in traditional Medicare as likely corresponding to increased health care use arising from more generous health insurance coverage.

We also present evidence that the expansion meaningfully impacted beneficiary spending. We document a reduction in out-of-pocket prescription drug spending that is offset by an increase in Medicare spending arising from the increased generosity of the LIS. We observe an increase in Part D participation, so we expect any sample composition changes to include beneficiaries who are less likely to use prescription drugs (or use fewer of them) than those who are always enrolled.

We acknowledge a few limitations of our analysis. First, we are unable to fully isolate the within-person spillovers that are the focus of our analysis and that our estimates may also reflect more general across-person spillovers. However, from a policy perspective, the aggregate effect is of interest whether the outcome is take-up or spending. With the Medicare claims data, we lack individual measures of income (or strong individual proxies for income) and insurance status before individuals turn 65. Thus, we are unable to precisely link Medicaid eligibility before age 65 to outcomes at age 65. We address this by focusing our analysis on Medicare beneficiaries in low-income zip codes who are most likely to have been affected by the ACA expansion. In addition, it would be interesting to examine whether these new enrollees are healthier or frailer than those who always enroll. However, because we focus on people turning 65 for whom we have no information on their prior health status, this type of analysis is difficult. Moreover, recent work has shown a reduction in mortality for near elderly adults pre age 65 arising from the ACA expansion (Miller et al., 2021). Since we can observe mortality at age 65 in the Medicare claims files, we explored it as a measure of health changes following expansion. However, there are differential pre-period trends in expansion versus non-expansion states, as shown in Appendix Figure 2. Finally, the data used in this paper end in 2017, which only allowed three years of exposure to ACA Medicaid before Medicare eligibility, and the event study results suggest that more years of exposure before age 65 correspond to larger effects on insurance enrollment. It is possible that the effect would be much bigger for individuals turning 65 in 2014 after 10 years of exposure to expansion Medicaid. Future work should examine the longer-run effects of exposure to Medicaid before age 65.

The main takeaways of this work have important policy implications. First, there is a notable increase in LIS enrollment. Policymakers have been concerned about low take-up of the LIS among those who are eligible but need to actively enroll; the take-up rate among this group is only about 33% (NCOA 2020). We believe that the increased dual Medicaid participation arising from the ACA Medicaid expansion dramatically increased the number of LIS enrollees because of the automatic LIS enrollment for dual Medicare-Medicaid beneficiaries. This also informs other policy settings with automatic enrollment, such as the new Centers on Medicare and Medicaid Services (CMS) rule that now confers automatic partial Medicaid enrollment for recipients of Supplemental Security Income (SSI),[24] which builds on automatic full Medicaid enrollment for Supplemental Security Income (SSI) recipients in the 34 states and the District of Columbia that are considered "1634 states."[25]

Another key takeaway is that the increase in dual Medicare-Medicaid enrollment arising from the ACA expansion is entirely in full, not partial, Medicaid. Since full Medicaid often covers services that Medicare does not (e.g., vision, dental, hearing), this increased enrollment confers important benefits to the new dual enrollees.

This increased dual enrollment, participation in the LIS, and Medicare Part D has important implications for both state and federal budgets. Since Medicaid costs are shared jointly by the federal and state governments, more enrollees in full Medicaid will impact both federal and state budgets. Increased participation in the LIS and Part D will impact the federal budget, as will the increased traditional Medicare spending. Overall, we take these results as further evidence that changes in one public program can have important spillover effects for other public programs.

[24] https://www.federalregister.gov/documents/2023/09/21/2023-20382/streamlining-medicaid-medicare-savings-program-eligibility-determination-and-enrollment. Viewed December 18, 2023. The rule also encourages states to automatically confer partial Medicaid enrollment to those LIS participants who are likely eligible.
[25] https://secure.ssa.gov/poms.nsf/lnx/0501715010. Viewed February 29, 2024.

References

Aizer, Anna and Jeffrey Grogger. 2003. "Parental Medicaid Expansions and Health Insurance Coverage." National Bureau of Economic Research Working Paper No. 9907.

Ambegaokar, Sonal, Zoe Neuberger, and Dorothy Rosenbaum. 2017. "Opportunities to Streamline Enrollment Across Public Benefit Programs." Center on Budget and Policy Priorities and Social Interest Solutions. https://www.cbpp.org/research/food-assistance/opportunities-to-streamline-enrollment-across-public-benefit-programs. Viewed April 2, 2024.

Anand, Priyanka, Jody Schimmel Hyde, Maggie Colby, and Paul O'Leary. 2019. "The Impact of Affordable Care Act Medicaid Expansions on Applications to Federal Disability Programs." *Forum for Health Economics and Policy.*

Armour, Philip. 2018. "The Role of Information in Disability Insurance Application: An Analysis of the Social Security Statement Phase-In." *American Economic Journal: Economic Policy*, 10(3): 1-41.

Aron-Dine, Aviva, Liran Einav, and Amy Finkelstein. 2013. "The RAND Health Insurance Experiment: Three Decades Later." *Journal of Economic Perspectives*, 27(1): 197-222.

Baicker, Katherine, Amy Finkelstein, Jae Song, and Sarah Taubman. 2014. "The Impact of Medicaid on Labor Market Activity and Program Participation: Evidence from the Oregon Health Insurance Experiment." *American Economic Review: Papers and Proceedings*, 104(5): 322-328.

Barkowski, Scott, Dajung Jun, and Yuting Zhang. 2022. "Medicaid expansion spillover effects on heath care consumption and coverage: evidence from Medicare administrative data." Melbourne Institute Working Paper No. 5/22. https://melbourneinstitute.unimelb.edu.au/publications/working-papers/search/result?paper=4074219.

Bhargava, Saurabh and Dayanand Manoli. 2015. "Psychological Frictions and the Incomplete Take-Up of Social Benefits: Evidence from an IRS Field Experiment." *American Economic Review*, 105(11): 3289-3529.

Black, Bernard, Alex Hollingsworth, Leticia Nunes, and Kosali Simon. 2019. "Simulated Power Analyses for Observational Studies: An Application to the Affordable Care Act Medicaid Expansion." Working Paper 25568. Working Paper Series. National Bureau of Economic Research. https://doi.org.10.3386/w25568.

Blavin, Fredric, Genevieve M. Kenney, and Michael Huntress. 2014. "The Effects of Express Lane Eligibility on Medicaid and CHIP Enrollment among Children." *Health Services Research*, 49(4):1268-1289. Doi: 10.1111/1475-6773.12157.

Borgschulte, Mark and Jacob Vogler. 2020. "Did the ACA Medicaid Expansion Save Lives?" *Journal of Health Economics*, 72(July): 102333. https://doi.org/10.1016/j.jhealeco.2020.102333.

Boudreaux, Michel H., K.T. Call, J. Turner, B. Fried, and B. O'Hara. 2015. "Measurement Error in Public Health Insurance Reporting in the American Community Survey: Evidence from Record Linkage." *Health Services Research*, 50: 1973-1995.

Boudreaux, Michael, James M. Noon, Bett Fried, and Joanne Pascale. 2019. "Medicaid Expansion and the Medicaid Undercount in the American Community Survey." *Health Services Research*, 54:1263-1272. Doi:10.1111/1475-6773.13213.

Brook, Robert H., John E. Ware, Jr., William H. Rogers, Emmett B. Keeler, Allyson R. Davies, Cathy A. Sherbourne, George A. Goldberg, Kathleen N. Lohr, Patricia Camp, and Joseph P. Newhouse. 1984. *The*

Effect of Coinsurance on the Health Status of Adults: Results from the Rand Health Insurance Experiment. RAND Corporation Report. Santa Monica, CA, December.

Buchmueller, Thomas C., Zachary M. Levinson, Helen G. Levy, and Barbara L. Wolfe. 2016. "Effect of the Affordable Care Act on Racial and Ethnic Disparities in Health Insurance Coverage." *AJPH Policy*, 106: 1416-1421. Doi:10.2105/AJPH.2016.303155.

Buchmueller, Thomas C. and Helen G. Levy. 2020. "The ACA's Impact On Racial and Ethnic Disparities in Health Insurance Coverage and Access to Care." *Health Affairs*, 39(3): 395-402. Doi:10.1377/hlthaff.2019.01394.

Bundorf, M. Kate, Maria Polyakova, Cheryl Stults, Amy Meehan, Roman Klimke, Ting Pun, Albert Solomon Chan, and Ming Tao-Seale. 2019. "Machine-Based Expert Recommendations and Insurance Among Medicare Part D Enrollees." *Health Affairs*, 38(3): 482-490. Doi:10.1377/hlthaff.2018.05017.

Burney, Shaheer, Rebecca Boehm, Rigoberto Lopez. 2021. "The impact of the ACA Medicaid expansion on SNAP participation." 2021. *Food Policy.* Doi:10.1016/j.foodpol.2021.102094.

Burns, Marguerite and Laura Dague. 2017. "The effect of expanding Medicaid eligibility on Supplemental Security Income program participation." *Journal of Public Economics*, 149: 20-34.

Burns, Marguerite, Laura Dague, Elizabeth Wood, and Jae Kennedy. 2022. "Effects of Medicaid Expansions 2001-2015 on Supplemental Security Income Program Participation Among Childless Adults." *Journal of Disability Policy Studies*, 33(3): 199-208. Doi: 10.1177/10442073221094807

Call, Kathleen T., Michael E. Davern, Jacob A. Klerman, and Victoria Lynch. 2013. "Comparing Errors in Medicaid Reporting Across Surveys: Evidence to Date." *Health Services Research*, doi: 10.1111/j.1475-6773.2012.01446.x

Card, D., A.K. Hildreth, and L. D. Shore-Sheppard. 2004. "The Measurement of Medicaid Coverage in the SIPP: Evidence from a Comparison of Matched Records." *Journal of Business and Economic Statistics.* 22:410-420. doi:10.1198/073500104000000208

Caswell, Kyle J. and Timothy A. Waidmann. 2017. "The Affordable Care Act Medicaid Expansions and Personal Finance." *Medical Care Research and Review*, 76(5). https://doi.org/10.1177/1077558717725164.

CCW Medicare Administrative Data User Guide. 2022. https://www2.ccwdata.org/web/guest/user-documentation. Viewed May 30, 2024.

Choi, James J., David Laibson, Brigitte C. Madrian. 2009. "Reducing the Complexity Costs of 401(k) Participation through Quick Enrollment." *Developments in the Economics of Aging*, David A. Wise, editor. University of Chicago Press. ISBN:0-226-90335-4.

Chu, Benjamin C. 2023. "Who did the ACA Medicaid expansion impact? Estimating the probability of being a complier." *Health Economics*, 32:1626-1655. DOI: 10.1002/hec.4682.

Courtemanche, Charles, James Marton, Benjamin Ukert, Aaron Yelowitz, Daniela Zapata. 2017. "Early Impacts of the Affordable Care Act on Health Insurance Coverage in Medicaid Expansion and Non-Expansion States." *Journal of Policy Analysis and Management*, 36(1): 178-210. Doi:10.1002/pam.21961.

Currie, Janet. 2006. "The Take-Up of Social Benefits." *Public Policy and the Distribution of Income*, Russell Sage Foundation, pp. 80-148.

Davern, Michael, Brian C. Quinn, Genevieve M. Kenney, and Lynn A. Blewett. 2009. "The American Community Survey and Health Insurance Coverage Estimates: Possibilities and Challenges for Health Policy Researchers." *Health Services Research*, 44(2pt1): 593-605. https://doi.org/10.1111/j.1475-6773.2008.00921.x

Domurat, Richard, Isaac Menashe, and Wesley Yin. 2021. "The Role of Behavioral Frictions in Health Insurance Marketplace Enrollment and Risk: Evidence from a Field Experiment." *American Economic Review*, 111(5): 1549-1574. Doi:10.1257/aer.20190823.

Dubay, Lisa and Genevieve Kenney. 2003. "Expanding Public Health Insurance to Parents: Effects on Children's Coverage Under Medicaid." *Health Services Research*, 38(5): 1283-1302. https://doi.org/10.1111/1475-6773.00177

Dusetzina, Stacie B., Haiden A. Huskamp, Russell L. Rothman, Laura C. Pinheiro, Andrew W. Roberts, Nilay D. Shah, Theresa L. Walunas, William A. Wood, Autumn D. Zuckerman, Leah L. Zullig, and Nancy L. Keating. 2022. "Many Medicare Beneficiaries Do Not Fill High-Price Specialty Drug Prescriptions." *Health Affairs*, 41(4): 487-496. 10.1377/hlthaff.2021.01742.

Ericson, Keith M. Marzilli. 2014. Consumer Inertia and Firm Pricing in the Medicare Part D Prescription Drug Insurance Exchange. *American Economic Journal: Economic Policy*, 6(1): 38-64.

Ericson, Keith M. Marzilli, Jon Kingsdale, Tim Layton, and Adam Sacarny. 2017. "Nudging Leads Consumers In Colorado To Shop But Not Switch ACA Marketplace Plans." *Health Affairs*, 36(2): 311-319. Doi:10.1377/hlthaff.2016.0993.

Ericson, Keith Marzilli, Timothy J. Layton, Adrianna McIntyre, and Adam Sacarny. 2023. "Reducing Administrative Barriers Increases Take-Up of Subsidized Health Insurance Coverage: Evidence from a Field Experiment." NBER Working Paper No. 30855.

Figlio, David N., Sarah Hamersma, and Jeffrey Roth. 2015. "Information Shocks and the Take-Up of Social Programs." *Journal of Policy Analysis and Management*, 34(4): 781-804. https://doi.org/10.1002/pam.21855.

Finkelstein, Amy and Matthew J. Notowidigdo. 2019. "Take-Up and Targeting: Experimental Evidence from SNAP." *The Quarterly Journal of Economics*, 1505-1556. Doi:10.1093/qje/qjz013

Frean, Molly, Jonathan Gruber, and Benjamin D. Sommers. 2017. "Premium subsidies, the mandate, and Medicaid expansion: Coverage effects of the Affordable Care Act." *Journal of Health Economics*, 53: 72-86. https://doi.org/10.1016/j.jhealeco.2017.02.004

Fung, Vicki, Mary Price, and David Cheng. 2024. "Associations Between Annual Medicare Part D Low-Income Subsidy Loss and Prescription Drug Spending and Use." *JAMA Health Forum*, 5(2):e235152. doi:/10.1001/jamahealthforum.2023.5152.

Furtado, Delia and Nikolaos Theodoropoulos. 2013. "SSI for Disabled Immigrants: Why Do Ethnic Networks Matter?" *The American Economic Review*, 103(3): 462-466.

Ghosh, Ausmita, Kosali Simon, and Benjamin D. Sommers. 2019. "The Effect of Health Insurance on Prescription Drug Use Among Low-Income Adults: Evidence from Recent Medicaid Expansions." *Journal of Health Economics*, 63(January): 64-80. https://doi.org/10.1016/j.jhealeco.2018.11.002.

Glaun, Kim. 2002. "Medicaid Programs to Assist Low-Income Medicare Beneficiaries: Medicare Savings Programs Case Study Findings." Kaiser Commission on Medicaid and the Uninsured. https://www.kff.org/wp-content/uploads/2013/01/medicaid-programs-to-assist-low-income-medicare-beneficiaries-medicare-savings-programs-case-study-findings-background-paper.pdf. Viewed November 10, 2022.

Glynn, Alexandra, Inmaculada Hernandez, and Eric T. Roberts. 2022. "Consequences of forgoing prescription drug subsidies among low-income Medicare beneficiaries with diabetes." *Health Services Research*, 57:1136-1144. Doi: 10.1111/1475-6773.13990.

Goldin, Jacob, Ithai Z. Lurie, and Janet McCubbin. 2021. "Health Insurance and Mortality: Experimental Evidence from Taxpayer Outreach." *The Quarterly Journal of Economics*, 136(1): 1-49. Doi:/10.1093/qje/qjaa029.

Goodman-Bacon, Andrew. 2021. "Difference-in-Differences with Variation in Treatment Timing." *Journal of Econometrics*, Themed Issue: Treatment Effect 1, 225(2): 254-77. https://doi.org/10.1016/j.jeconom.2021.03.014.

Grossman, Daniel and Umair Khalil. 2020. "Neighborhood networks and program participation." Journal of Health Economics 70: 102257.

Gruber, Jonathan and Benjamin D. Sommers. 2019. "The Affordable Care Act's Effects on Patients, Providers, and the Economy: What We've Learned so Far." *Journal of Policy Analysis and Management*, 38(4): 1028-52. https://doi.org/10.1002/pam.22158.

Guldi, Melanie, Amelia Hawkins, Jeffrey Hemmeter, and Lucie Schmidt. Forthcoming. "Supplemental Security Income for Children, Maternal Labor Supply, and Family Well-Being: Evidence from Birth Weight Eligibility Cutoffs." DOI: https://doi.org/10.3368/jhr.0818-9654R2

Guzman, Gloria and Melissa Kollar. 2023. "Income in the United States: 2022." U.S. Census Bureau. P60-279. https://www.census.gov/content/dam/Census/library/publications/2023/demo/p60-279.pdf. Viewed April 2, 2024.

Hamersma, Sarah, Matthew Kim, and Brenden Timpe. 2019. "The Effect of Parental Medicaid Expansions on Children's Health Insurance Coverage." *Contemporary Economic Policy*, 37(2): 297-311. https://doi.org/10.1111/coep.12392.

Health and Human Services, Assistant Secretary for Planning and Evaluation Office of Health Policy. 2021. "Health Coverage Under the Affordable Care Act: Enrollment Trends and State Estimates." Issue Brief HP 2021-13. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//200776/ASPE%20Issue%20Brief-ACA-Related%20Coverage%20by%20State.pdf. Viewed December 12, 2023.

Herd, Pamela and Donald P. Moynihan. 2018. *Administrative Burden: Policymaking by Other Means*, Russell Sage Foundation. https://doi.org/10.7758/9781610448789.

Hoynes, Hilary, Diane Whitmore Schanzenbach, and Douglas Almond. 2016. "Long-Run Impacts of Childhood Access to the Safety Net." *American Economic Review*, 106(4):903-934. Doi:10.1257/aer.20130375

Hudson, Julie L. and Asako S. Moriya. 2017. "Medicaid Expansion for Adults had Measurable 'Welcome Mat' Effects On Their Children." *Health Affairs*, 36(9): 1643-1651. 10.1377/hlthaff.2017.0347.

IRS. 2022. "SOI Tax Stats – Individual Income Tax Statistics – ZIP Code Data (SOI) | Internal Revenue Service." Individual Tax Statistics ZIP Code Data – SOI. 2022. https://www.irs.gov/statistics/soi-tax-stats-individual-income-tax-statistics-zip-code-data-soi.

Jones, Jordan W., Charles Courtemanche, Augustine Denteh, James Marton, and Rusty Tchernis. 2022. "Do state Supplemental Nutrition Assistance Program policies influence program participation among seniors?" *Applied Economic Perspectives and Policy*, 44(2):591-608. https://doi.org/10.1002/aepp.13231.

Kaiser Family Foundation, 2020. " Medicaid and CHIP Eligibility, Enrollment, and Cost Sharing Policies as of January 2020: Findings from a 50-State Survey" (Tricia Brooks, Lauren Roygardner, Samantha Artiga, Olivia Pham, and Rachel Dolan) https://files.kff.org/attachment/Report-Medicaid-and-CHIP-Eligibility,-Enrollment-and-Cost-Sharing-Policies-as-of-January-2020.pdf

Kenney, Genevieve M., Sharon K. Long and Adela Luque. 2010. "Health Reform in Massachusetts Cut the Uninsurance Rate Among Children in Half." *Health Affairs*, 29(6). https://doi.org/10.1377/hlthaff.2010.0314

Khatana, Sameed Ahmed M., Anjali Bhatla, Ashwin S. Nathan, Jay Giri, Changyu Shen, Dhruv S. Kazi, Robert W. Yeh, and Peter W. Groeneveld. 2019. "Association of Medicaid Expansion with Cardiovascular Mortality." *JAMA Cardiology* 4(7): 671-79. https://doi.org/10.1001/jamacardio.2019.1651.

Lynch, V. 2008. "Medicaid Enrollment: The Relationships Between Survey Design, Enrollee Characteristics, and False-Negative Reporting." *JSM Proceedings, Statistical Computing Section.* Alexandria, VA: American Statistical Association. https://www.asarms.org/Proceedings/y2008/Files/302382.pdf

Maestas, Nicole, Kathleen J. Mullen, and Alexander Strand. 2014. "Disability Insurance and Health Insurance Reform: Evidence from Massachusetts." *American Economic Review*, 104 (5): 329-35. DOI: 10.1257/aer.104.5.329

McInerney, Melissa, Ruth Winecoff, Padmaja Ayyagari, Kosali Simon, and M. Kate Bundorf. 2020. "ACA Medicaid Expansion Associated With Increased Medicaid Participation and Improved Health *INQUIRY: The Journal of Health Care organization, Provision, and Financing* 57(January): 0046958020935299. https://doi.org/10.1177/0046958020935229

McInerney, Melissa, Grace McCormack, Jennifer M. Mellor, and Lindsay M. Sabik. 2022. "Association of Medicaid Expansion With Medicaid Enrollment and Health Care Use Among Older Adults With Low Income and Chronic Condition Limitations." *JAMA Health Forum*, 3(6):e221373. Doi:10.1001/jamahealthforum.2022.1373.

McInerney, Melissa, Jennifer M. Mellor, and Lindsay M. Sabik. 2021. "Welcome Mats and On-Ramps for Older Adults: The Impact of the Affordable Care Act's Medicaid Expansions on Dual Enrollment in Medicare and Medicaid." *Journal of Policy Analysis and Management* 40(1): 12-41 https://doi.org/10.1002/pam.22259.

McIntyre, Adrianna, Mark Shepard, and Myles Wagner. 2021. "Can Automatic Retention Improve Health Insurance Market Outcomes?" *AEA Papers and Proceedings*, 111:560-566. Doi:10.1257/pandp.20211083

McMorrow, Stacey, Sharon K. Long, Genevieve M. Kenney, and Nathanial Anderson. 2015. "Uninsurance Disparities have Narrowed for Black and Hispanic Adults Under the Affordable Care Act." *Health Affairs*, 34(10): 1774-1778. Doi:10.1377/hlthaff.2015.0757

Meijer, E., L.A. Karoly, and P.-C. Michaud. 2010. "Using Matched Survey and Administrative Data to Estimate Eligibility for the Medicare Part D Low-Income Subsidy Program." *Social Security Bulletin*, 70,63-82.

Mellor, Jennifer M., Melissa McInerney, and Lindsay M. Sabik. 2021. "Misclassification of Medicaid Participation by Dual Eligibles: Evidence from the Medicare Current Beneficiary Survey." *Medical Care Research and Review*, 78(2): 113-124. Doi: 10.1177/10775587/19858839

Meyers, David J., Vincent Mor, Momotazur Rahman, and Amal N. Trivedi. 2021. "Growth in Medicare Advantage Greatest Among Black and Hispanic Enrollees." *Health Affairs,* 40(6). j wr u<llf qk0qti 13203599 1j nj chh0424302233: .

Miller, Sarah, Norman Johnson, and Laura R. Wherry. 2021. "Medicaid and Mortality: New Evidence from Linked Survey and Administrative Data." The Quarterly Journal of Economics 136(3): 1783-1829. https://doi.org/10.1093/qje/qjab004.

Miller, Sarah and Laura R. Wherry. 2019. "The Long-Term Effects of Early Life Medicaid Coverage." *Journal of Human Resources*, 54(3):785-824. Doi:10.3368/jhr.54.3.0816.8173R1

NCOA. 2020. "Take-Up Rates in Medicare Savings Programs and the Part D Low-Income Subsidy Among Community-Dwelling Medicare Beneficiaries Age 65 and Older." file:///Users/mmcine01/Downloads/2021-CBA-Take-Up-Rates-in-Medicare-Savings-Programs-June-2020-Issue%20Brief_4-27-1.pdf. Viewed November 10, 2022.

Newhouse, Joseph P. 2004. "Consumer-Directed Health Plans and the RAND Health Insurance Experiment." *Health Affairs*, 23(6): 107-13.

Noon, James M., Leticia E. Fernandez, Sonya R. Porter. 2018. "Response Error and the Medicaid Undercount in the Current Population Survey." *Health Services Research*, 54:34-43. Doi:10.1111/1475-6773.13058.

Pena, Maria T., Maiss Mohamed, and Alice Burns. 2023. "Medicaid Arrangements to Coordinate Medicare and Medicaid for Dual-Eligible Individuals." Kaiser Family Foundation. https://www.kff.org/medicaid/issue-brief/medicaid-arrangements-to-coordinate-medicare-and-medicaid-for-dual-eligible-individuals/

Pezzin, Liliana E. and Judith D. Kasper. 2002. Medicaid Enrollment among Elderly Medicare Beneficiaries: Individual Determinants, Effects of State Policy, and Impact on Service Use. *Health Services Research*, 37(4): 827-847.

Popham, Lauren, Howard Bedlin, Leslie Fried, Susan L. Silberman, Jack Hoadley, and Vladislav Slanchev. 2020. "Take-Up Rates in Medicare Savings Programs and the Part D Low-Income Subsidy Among Community-Dwelling Medicare Beneficiaries Age 65 and Older." National Council on Aging Issue Brief. June 2020.

Remler, Dahlia and Sherry Glied. 2003. "What Other Programs Can Teach Us: Increasing Participation in Health Insurance Programs." *American Journal of Public Health*.

Rennane, Stephanie and Andrew Dick. 2023. "Effects of Medicaid Automatic Enrollment on Disparities in Insurance Coverage and Caregiver Burden for Children with Special Health Care Needs." *Medical Care Research and Review*, 80(1):65-78. Doi: 10.1177/19775587221106116.

Rennane, Stephanie, Danielle Sobol, Bradley D. Stein, and Andrew Dick. 2023. "Insurance Coverage During Transitions: Evidence from Medicaid Automatic Enrollment for Children Receiving Supplemental Security Income." *Health Services Research.* doi: 10.1111.1475-6773.14261.

Roberts, Eric T. 2024. "Invited Commentary: Addressing Annual Losses in Medicare Part D Low-Income Subsidy Program." *JAMA Health Forum*, 5(2):e234772. doi:10.1001/jamahealthforum.2023.4772.

Roberts, Eric T., Alexandra Glynn, Noelle Cornelio, Julie M. Donohue, Walid F. Gellad, J. Michael McWilliams, and Lindsay M. Sabik. 2021. "Medicaid Coverage 'Cliff' Increases Expenses and Decreases Care for Near-Poor Medicare Beneficiaries." *Health Affairs*, 40(4):552-561. 10.1377/hlthaff.2020.02272.

Roberts, Eric T., Jennifer M. Mellor, Melissa P. McInerney, and Lindsay M. Sabik. 2022. "Effects of a Medicaid dental coverage 'cliff' on dental care access among low-income Medicare beneficiaries." *Health Services Research*, 10.1111/1475-6773.13981.

Rupp, Kalman and Gerald F. Riley. 2016. "State Medicaid Eligibility and Enrollment Policies and Rates of Medicaid Participation among Disabled Supplemental Social Security Income Recipients." *Social Security Bulletin*, 76(3):17-ii.

Sacarny, Adam, Katherine Baicker, and Amy Finkelstein. 2022. "Out of the Woodwork: Enrollment Spillovers in the Oregon Health Insurance Experiment." *American Economic Journal: Economic Policy*, 14(3): 273-295.

Schmidt, Lucie, Lara Shore-Sheppard, and Tara Watson. 2024. "Safety-Net Program Spillovers and Administrative Burden." *National Tax Journal*, 77(1). https://doi.org/10.1086/728475.

Schmidt, Lucie, Lara D. Shore-Sheppard, and Tara Watson. 2020. "The Impact of the ACA Medicaid Expansion on Disability Program Applications." *American Journal of Health Economics*, 6(4). Doi:10.1086/710525

Schmidt, Lucie, Lara Shore-Sheppard, and Tara Watson. 2021. "The Impact of Expanding Public Health Insurance on Safety Net Program Participation: Evidence from the ACA Medicaid Expansion." NBER Working Paper No. 26504.

Shepard, Mark and Myles Wagner. 2022. "Reducing Ordeals through Automatic Enrollment: Evidence from a Health Insurance Exchange."

Shoemaker, J. Samantha, Amy J. Davidoff, Bruce Stuary, Ilene H. Zuckerman, Eberechukeu Onukwugha, and Christopher Powers. 2012. "Eligibility and Take-Up of the Medicare Part D Low-Income Subsidy." *INQUIRY: The Journal of Health Care Organization, Provision, and Financing.* https://doi.org/10.5034/inquiryjrnl.49.03.04.

Social Security Administration (SSA). 2024. "Understanding the *Extra Help* with Your Medicare Prescription Drug Plan." https://doi.org/10.7758/9781610448789. Viewed March 4, 2024.

Sommers, Benjamin D., Genevieve M. Kenney, and Arnold M. Epstein. 2014. "New Evidence On The Affordable Care Act: Coverage Impacts of Early Medicaid Expansions." *Health Affairs*, 33(1): 78-87. 10.1377/hlthaff.2013.1087.

Sommers, Benjamin D., Robert J. Blendon, John Orav, and Arnold M. Epstein. 2016. "Changes in Utilization and Health Among Low-Income Adults After Medicaid Expansion or Expanded Private Insurance." *JAMA Internal Medicine*, 176(10):1501-1509. Doi:10.1001/jamainternmed.2016.4419

Soni, Aparna, Marguerite E. Burns, Laura Dague, and Kosali I. Simon. 2017. "Medicaid Expansion and State Trends in Supplemental Security Income Program Participation." *Health Affairs*, 36(8): 1485-1488. Doi:10/1377/hlthaff.2016.1632

Soni, Aparna, Laura R. Wherry, and Kosali I. Simon. 2020. "How Have ACA Insurance Expansions Affected Health Outcomes? Findings from the Literature." *Health Affairs (Project Hope)* 39(3): 371-78. https://doi.org/10.1377/hlthaff.2019.01436.

Sonier, Julie, Michel H. Boudreaux, and Lynn A. Blewett. 2013. "Medicaid 'Welcome-Mat' Effect of Affordable Care Act Implementation Could Be Substantial." *Health Affairs*, 32(7). https://doi.org/10.1377/hlthaff.2013.0360.

Stuart, Bruce, Xianghua Yin, Amy Davidoff, Linda Simoni-Wastila, Ilene Zuckerman, J. Samantha Shoemaker, and Jalpa Doshi. 2012. "Impact of Part D Low-Income Subsidies on Medication Patterns for Medicare Beneficiaries with Diabetes." *Medical Care*, 50(11): 913-919.

Tiedemann, Amy M. and Kimberley Fox. 2005. "Promising Strategies for Medicare Savings Program Enrollment: Modifying Eligibility Criteria and Documentation Requirements." State Solutions: An

Initiative to Improve Enrollment in Medicare Savings Programs. http://www.cshp.rutgers.edu/Downloads/5300.pdf. Viewed November 10, 2022.

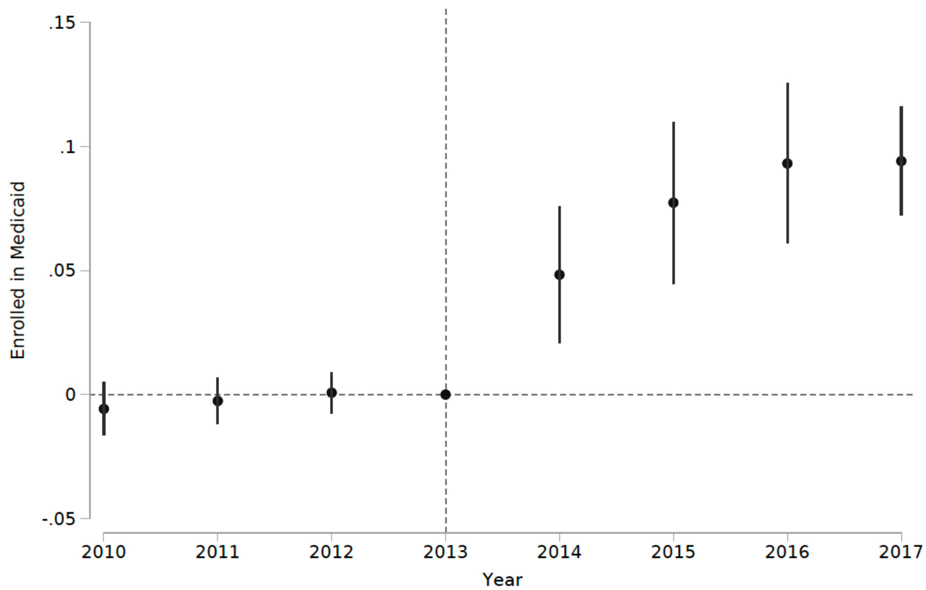
Ungaro, Ryan and Alex D. Federman. 2009. "Restrictiveness of Eligibility Determination and Medicaid Enrollment by Low-Income Seniors." *Journal of Aging and Social Policy*, 21(4): 338-351. https://doi.org/10.1080/08959420903166993

Urban Institute, 2024. " What We Know About Medicare Enrollment for Dual Enrollees" https://www.urban.org/data-tools/medicare-medicaid-dual-enrollment-available-plans

Yala, Stella M., Obidiugwu Kenrik Duru, Susan L. Ettner, Norman Turk, Carol M. Mangione, and Arleen F. Brown. 2014. "Patterns of Prescription Drug Expenditures and Medication Adherence Among Medicare Part D Beneficiaries with and without the Low-Income Supplement." *BMC Health Services Research*.

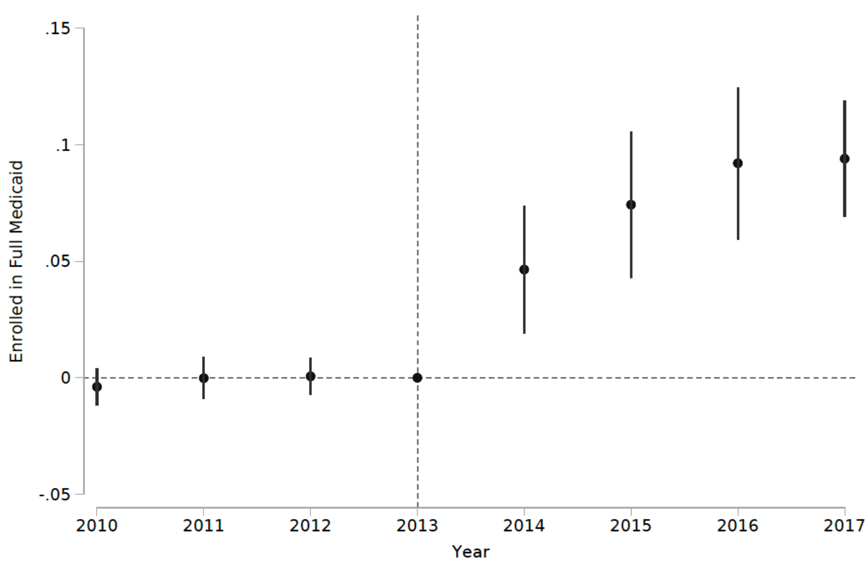
Yokum, David, Daniel J. Hopkins, Andrew Feher, Elana Safran, and Joshua Peck. 2022. "Effectiveness of Behaviorally Informed Letters on Health Insurance Marketplace Enrollment." *JAMA Health Forum*, 3(3):e220034. Doi:10.1001/jamahealthforum.20220034

Figure 1: Likelihood Beneficiary Enrolled in Any Dual Medicaid, 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



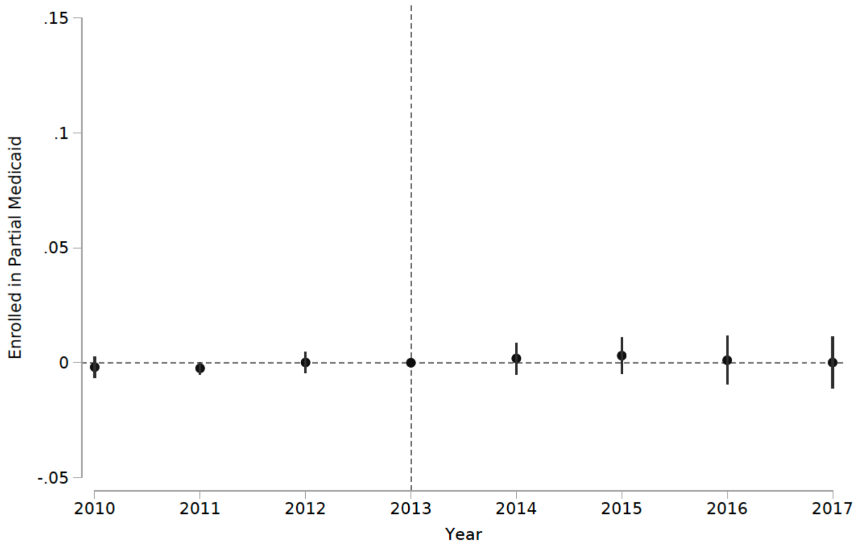
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.604.

Figure 2: Likelihood Beneficiary Enrolled in Full Medicaid, 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



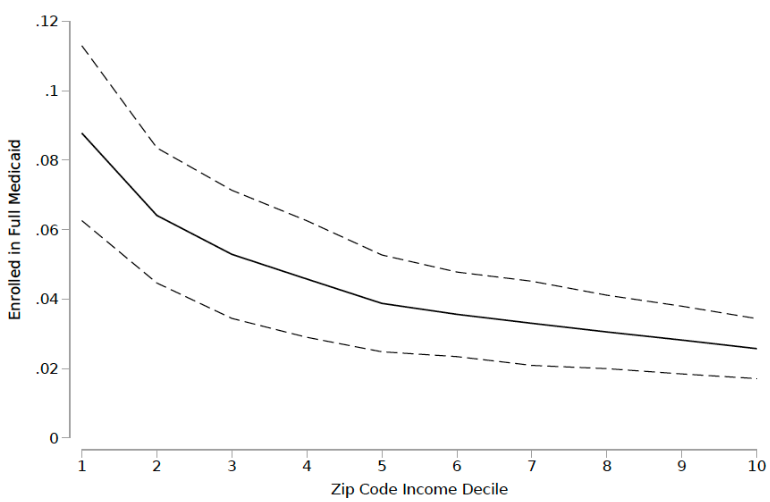
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.546.

Figure 3: Likelihood Beneficiary Enrolled in Partial Medicaid, 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



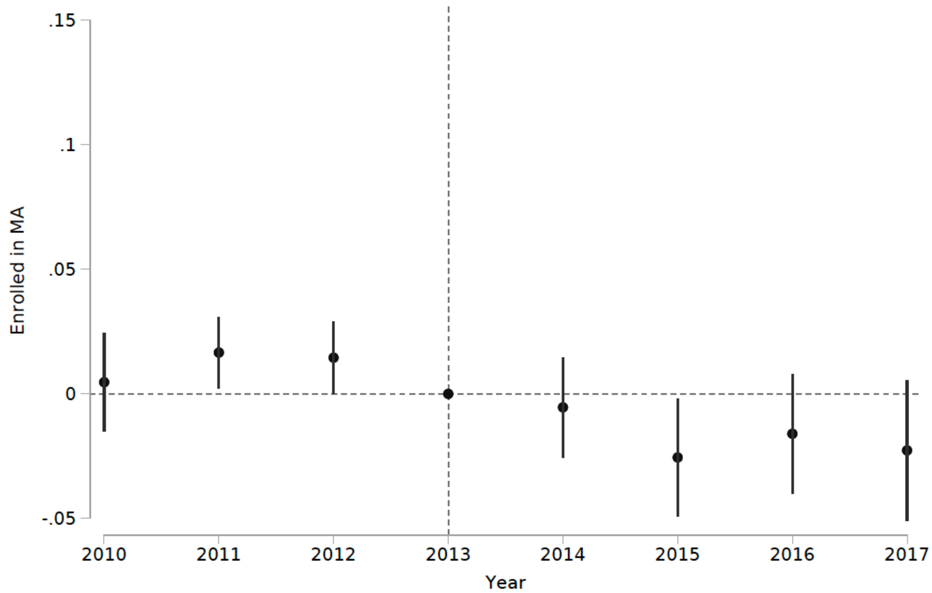
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.255.

Figure 4: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Full Medicaid, 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



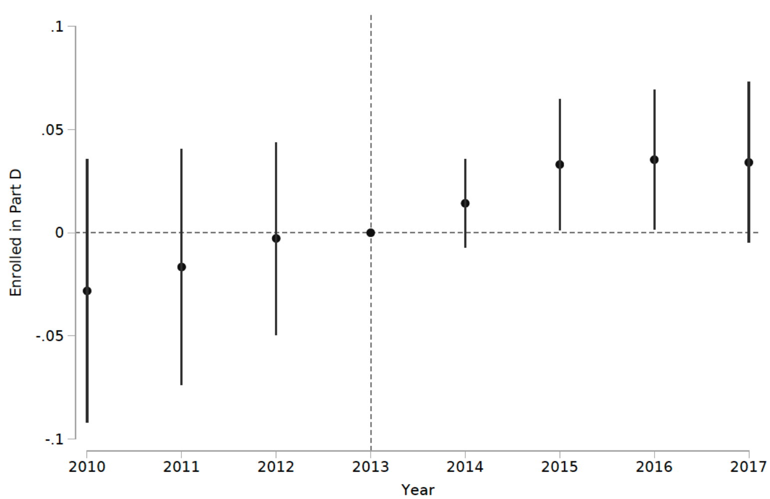
Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Figure 5: Likelihood Beneficiary Enrolled in Medicare Advantage, 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



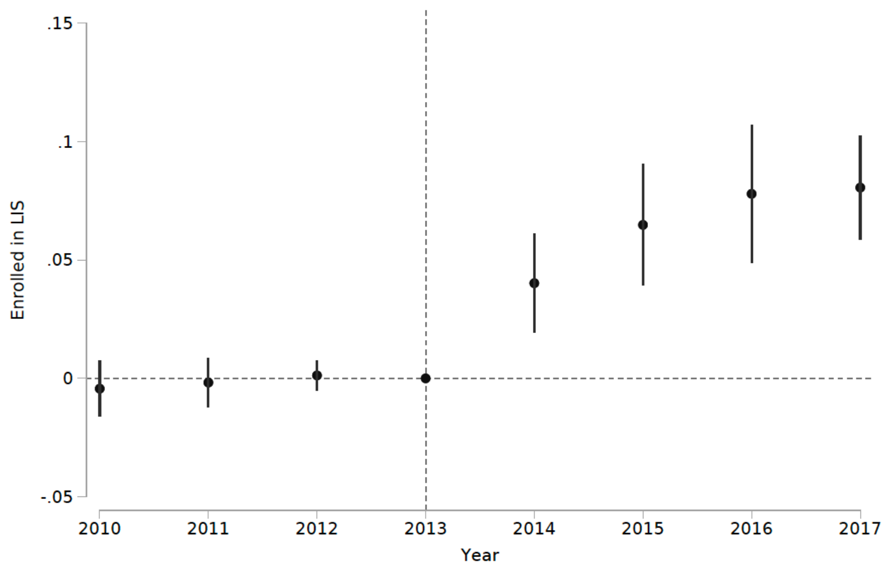
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.083.

Figure 6: Likelihood Beneficiary Enrolled in Medicare Part D, 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



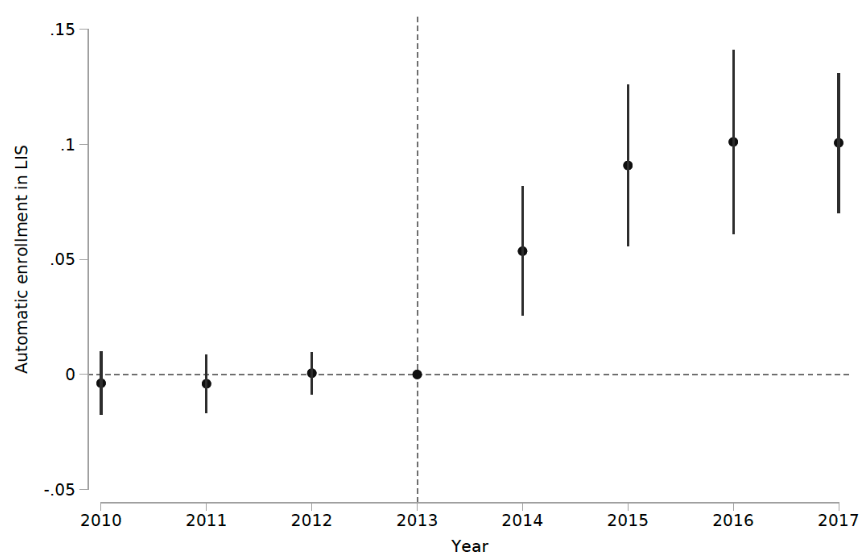
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.291.

Figure 7: Likelihood Beneficiary Enrolled in Low Income Subsidy (LIS), 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



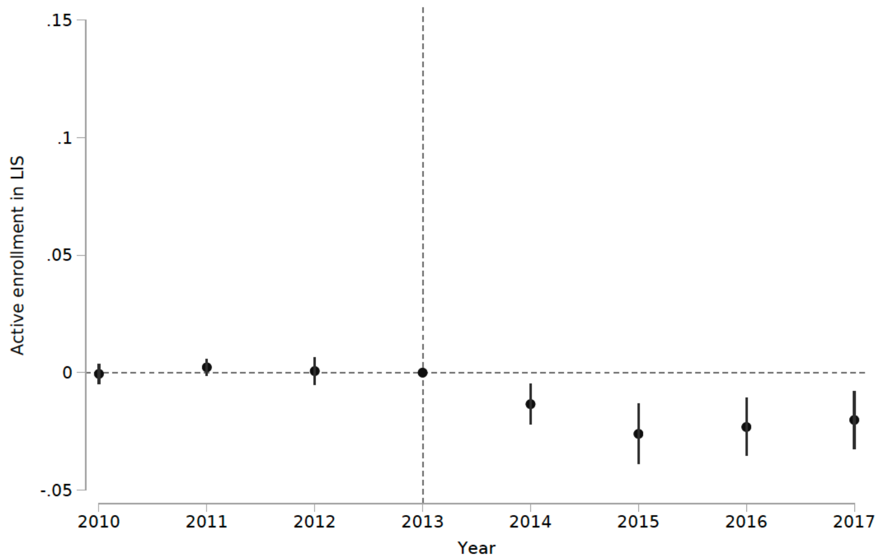
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.681.

Figure 8: Likelihood Beneficiary Automatically Enrolled in the Low Income Subsidy (LIS), 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



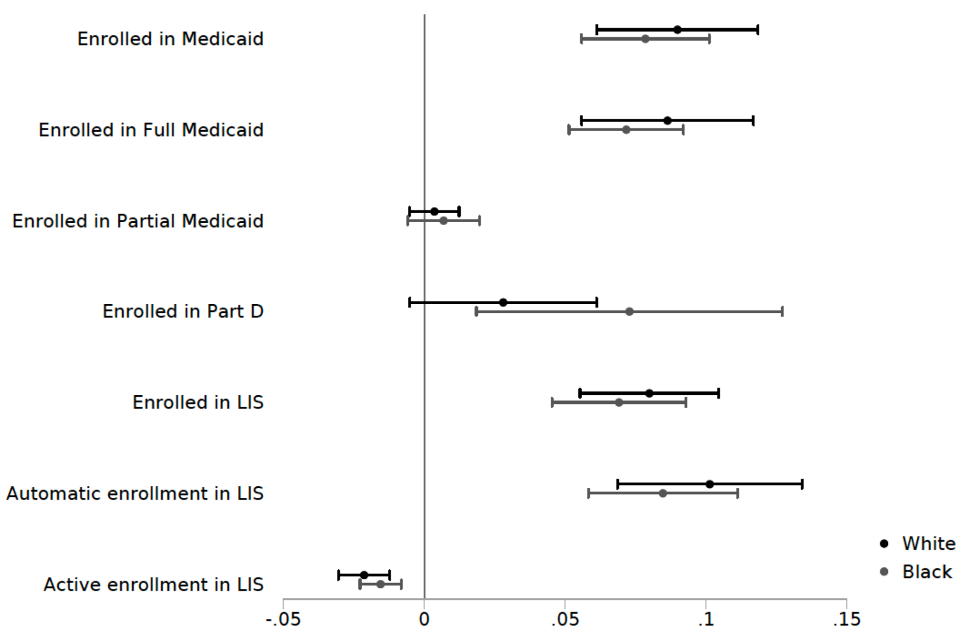
Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.858.

Figure 9: Likelihood Beneficiary Actively Enrolls in the Low Income Subsidy (LIS), 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017



Notes: N=1,415,135. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval. Test of joint significance of pre-period coefficients: p=0.043.

Figure 10: Effect of ACA Expansion on Insurance Enrollment for Black and White Medicare Beneficiaries



Notes: There are 605,914 white beneficiaries and 396,983 Black beneficiaries. Regressions include controls for sex and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval.

Table 1: Study Sample Characteristics, Reflecting Calendar Year Enrollee Turned 65 from Medicare Master Beneficiary Summary File (MBSF) and Cost and Utilization Segment, 2010-2013; 2015-2017

	All zip codes all states	All zip codes except late expansion states	Low-income zip codes except late expansion states, insurance sample	Low-income zip codes except late expansion states, TM only	Low-income zip codes except late expansion states, Part D only
	(1)	(2)	(3)	(4)	(5)
Mean AGI in zip code	65,258	65,843	29,789	29,913	29,611
	(44,389)	(45,585)	(3,408)	(3,376)	(3,470)
Female	0.53	0.53	0.54	0.52	0.58
White	0.80	0.80	0.49	0.50	0.47
Black	0.09	0.09	0.32	0.33	0.31
Hispanic	0.02	0.02	0.09	0.08	0.11
Asian	0.03	0.03	0.03	0.03	0.03
Native American	0.003	0.003	0.01	0.01	0.01
Other Race	0.03	0.03	0.04	0.04	0.04
Unknown Race	0.04	0.04	0.02	0.02	0.02
Resides in expansion state	0.54	0.59	0.51	0.51	0.53
Region					
Northeast	0.18	0.15	0.12	0.11	0.13
Midwest	0.23	0.22	0.19	0.21	0.18
South	0.37	0.39	0.48	0.48	0.46
West	0.22	0.24	0.21	0.21	0.23
Dependent variables					
Enrolled in Dual Medicaid	0.08	0.09	0.24	0.22	0.41
Enrolled in Full Medicaid	0.07	0.07	0.20	0.19	0.33
Enrolled in Partial Medicaid	0.02	0.02	0.05	0.03	0.07
Enrolled in MA	0.22	0.22	0.29	0.00	0.48
Enrolled in Part D	0.51	0.51	0.58	0.42	1.00
Enrolled in LIS	0.10	0.10	0.27	0.24	0.47
Automatic enrollment in LIS	0.08	0.08	0.23	0.21	0.40
Active enrollment in LIS	0.02	0.02	0.04	0.03	0.07
N	17,737,892	16,223,075	1,234,963	878,181	719,070

Note: Standard deviation of continuous variables in parentheses. Data source is 2010-2013 and 2015-2017 Medicare claims. Unit of observation is a 65 year old beneficiary; outcomes are evaluated for the calendar year in which the beneficiary turns 65. Late expansion states are Alaska, Indiana, Louisiana, Montana, and Pennsylvania.

Table 2: Impact of ACA Medicaid Expansion for Adults Ages 18-64 on Enrollment in Dual Medicaid and Medicare Advantage

	Enrolled in Medicaid	Enrolled in Full Medicaid	Enrolled in Partial Medicaid	Medicaid + TM	Medicaid + MA	Enrolled in MA	Enrolled in MA, state had no Medicaid MCO for under 65	Enrolled in MA, state had some Medicaid MCO share for under 65
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post x Expansion	0.090***	0.088***	0.002	0.061***	0.029***	-0.030**	-0.053*	-0.029*
	(0.012)	(0.012)	(0.004)	(0.013)	(0.007)	(0.014)	(0.026)	(0.015)
Female	0.030***	0.021***	0.009***	0.013***	0.017***	0.060***	0.051***	0.061***
	(0.005)	(0.006)	(0.003)	(0.004)	(0.002)	(0.006)	(0.004)	(0.006)
Black	0.070***	0.061***	0.010*	0.052***	0.019**	0.015	0.036***	0.013
	(0.013)	(0.011)	(0.005)	(0.008)	(0.008)	(0.012)	(0.006)	(0.013)
Hispanic	0.253***	0.212***	0.040**	0.133***	0.120***	0.037	-0.049	0.038
	(0.026)	(0.031)	(0.015)	(0.013)	(0.03)	(0.043)	(0.029)	(0.044)
Asian	0.190***	0.177***	0.012***	0.108***	0.082**	0.024	-0.042**	0.024
	(0.024)	(0.026)	(0.004)	(0.04)	(0.04)	(0.048)	(0.017)	(0.049)
Native American	0.119***	0.111***	0.008***	0.135***	-0.016	-0.133***	-0.047	-0.168***
	(0.019)	(0.02)	(0.003)	(0.024)	(0.011)	(0.028)	(0.043)	(0.02)
Other Race	0.046**	0.039**	0.006***	0.033***	0.013	-0.051***	-0.005	-0.053***
	(0.019)	(0.018)	(0.002)	(0.009)	(0.01)	(0.015)	(0.023)	(0.016)
Unknown Race	0.067***	0.070***	-0.003	0.057***	0.009	-0.033**	-0.026**	-0.034**
	(0.023)	(0.022)	(0.002)	(0.018)	(0.013)	(0.013)	(0.023)	(0.016)
Pre-treatment treated mean	0.248	0.224	0.025	0.18	0.068	0.268	0.175	0.271
% change	36.3	39.2	9.7	33.9	42.6	-11.3	-30.3	-10.7
N	1,234,963	1,234,963	1,234,963	1,234,963	1,234,963	1,234,963	96,189	1,138,778

Regressions include state and year fixed effects. Standard errors clustered by state. * p<0.10, ** p<0.05, *** p<0.01

Table 3: Impact of ACA Medicaid Expansion for Adults Ages 18-64 on Enrollment in Part D and the Low Income Subsidy (LIS)

	Enrolled in Part D	Enrolled in LIS	Automatic enrollment in LIS	Active enrollment in LIS
	(1)	(2)	(3)	(4)
Post x Expansion	0.045**	0.076***	0.099***	-0.024***
	(0.019)	(0.011)	(0.016)	(0.005)
Female	0.087***	0.034	0.027	0.007
	(0.004)	(0.005)	(0.005)	(0.002)
Black	0.017**	0.077***	0.069***	0.008**
	(0.007)	(0.014)	(0.012)	(0.003)
Hispanic	0.091***	0.276***	0.239***	0.037***
	(0.026)	(0.025)	(0.027)	(0.008)
Asian	0.063***	0.198***	0.180***	0.019***
	(0.018)	(0.021)	(0.025)	(0.004)
Native American	-0.089***	0.113***	0.114***	-0.001***
	(0.023)	(0.02)	(0.018)	(0.005)
Other Race	0.020*	0.033*	0.026**	0.007*
	(0.01)	(0.016)	(0.015)	(0.002)
Unknown Race	0.026**	0.055**	0.052**	0.003
	(0.01)	(0.022)	(0.021)	(0.002)
Pre-treatment treated mean	0.528	0.28	0.239	0.04
% change	8.5	27.1	41.5	-58.8

Note: There are 1,234,963 observations. Regressions include state and year fixed effects. Standard errors clustered by state. * p<0.10, ** p<0.05, *** p<0.01

Table 4: Effect of ACA Medicaid Expansion for Adults Ages 18-64 on Spending in Traditional Medicare (TM) and Medicare Part D

	(1)	(2)	(3)
Panel A: TM Beneficiaries, Inpatient Spending			
	ln(Total spending)	ln(Medicare spending)	ln(Total non-Medicare spending)
Post x Expansion	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)
Pre-treatment treated mean (in dollars)	192.1	171.6	20.5
Panel B: TM Beneficiaries, Spending on Outpatient Services			
	ln(Total spending)	ln(Medicare spending)	ln(Total non-Medicare spending)
Post x Expansion	0.13**	0.12**	0.09**
	(0.05)	(0.04)	(0.04)
Pre-treatment treated mean (in dollars)	206.7	146.4	60.3
Panel C: Part D Beneficiaries, Spending on Prescription Drugs			
	ln(Total spending)	ln(Medicare spending)	ln(Beneficiary spending)
Post x Expansion	-0.03	0.10**	-0.27***
	(0.04)	(0.05)	(0.06)
Pre-treatment treated mean (in dollars)	145.2	114.7	36.8

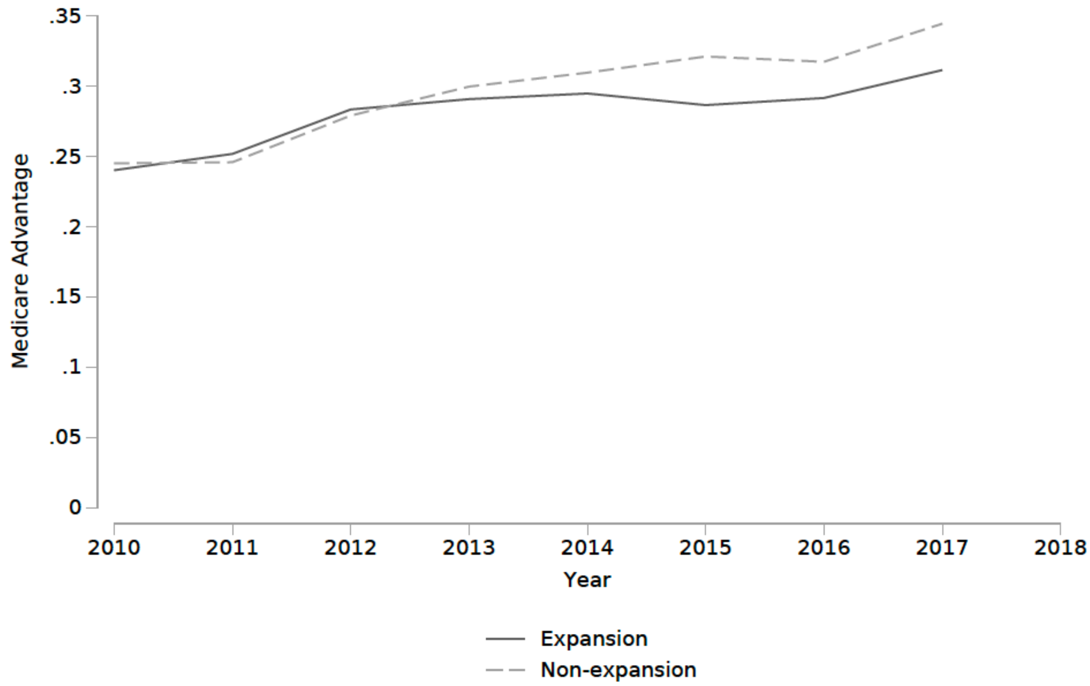
Note: There are 719,070 observations in Panels A and B and 878,181 observations in Panel C. For beneficiaries with $0 in spending, we use $1 for taking logs. Each regression controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, and unknown race and ethnicity; non-Hispanic white is the left-out category), and state and year fixed effects. Standard errors clustered by state. * p<0.10, ** p<0.05, *** p<0.01

Table 5: Effect of ACA Medicaid Expansion for Adults Age 18-64 on Medicare Utilization

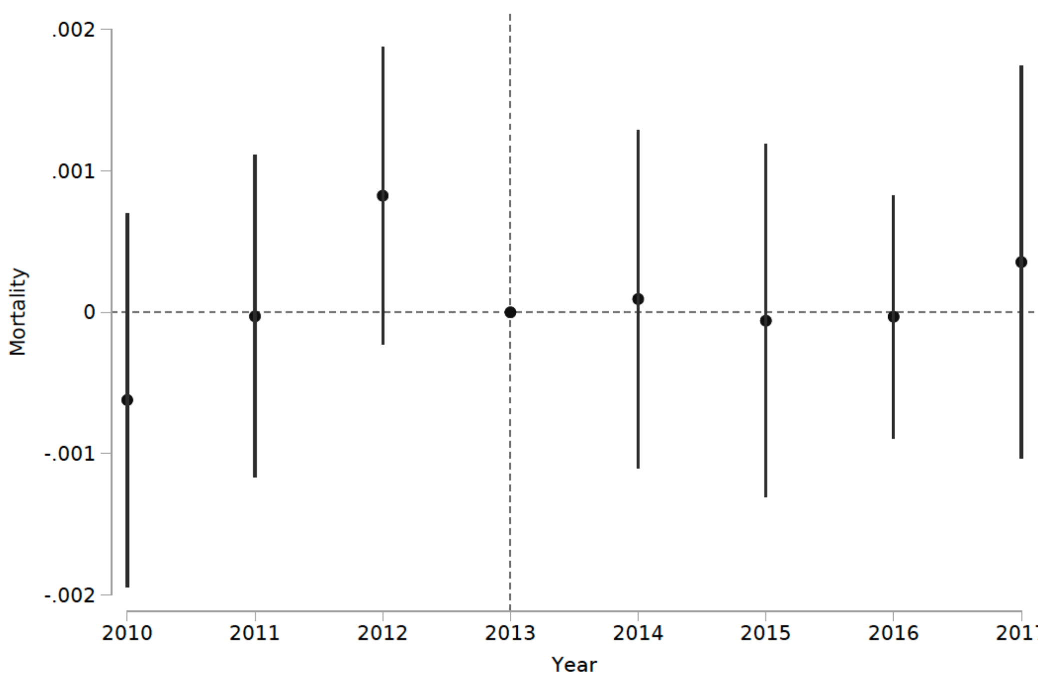
	(1)	(2)	(3)
Panel A: TM Enrollees, Inpatient Utilization			
	Number of Events	=1 if Any Events	Number of Events, if any
Post x Expansion	-0.001	-0.001	-0.005
	(0.001)	(0.001)	(0.008)
Pre-treatment mean, exp. states	0.02	0.05	0.43
% change	-4.6	-2.6	-1.2
Panel B: TM Beneficiaries, Outpatient Utilization			
	Number of Events	=1 if Any Events	Number of Events, if any
Post x Expansion	0.078	0.027***	-0.074
	(0.058)	(0.009)	(0.091)
Pre-treatment mean, exp. states	1.92	0.48	3.96
% change	4.1	5.6	-1.9
Panel C: Part D Enrollees, Prescription Drug Utilization			
	# Part D 30-day fills (per Part D month)	=1 if had any Part D 30-day fills	# Part D 30-day fills (per Part D month), among those who had any
Post x Expansion	-0.15***	-0.02*	-0.11**
	(0.04)	(0.01)	(0.05)
Pre-treatment mean, exp. states	2.92	0.76	3.86
% change	-5.0	-2.2	-2.7

There are 878,181 observations in Panels A and B and 719,070 observations in Panel C. Each regression controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, and unknown race and ethnicity; non-Hispanic white is the left-out category), and state and year fixed effects. Standard errors clustered by state. * p<0.10, ** p<0.05, *** p<0.01

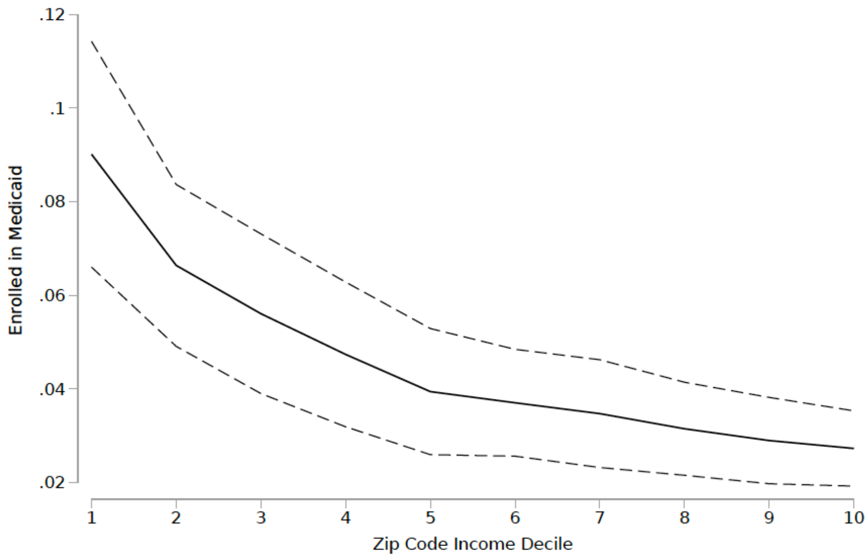
Appendix Figure 1: Medicare Advantage Enrollment Among 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip codes, by Expansion State Status (2010-2017)



Appendix Figure 2: Likelihood Beneficiary Dies at Age 65, 65-Year-Old Medicare Beneficiaries Residing in Low-Income Zip Codes 2010-2017

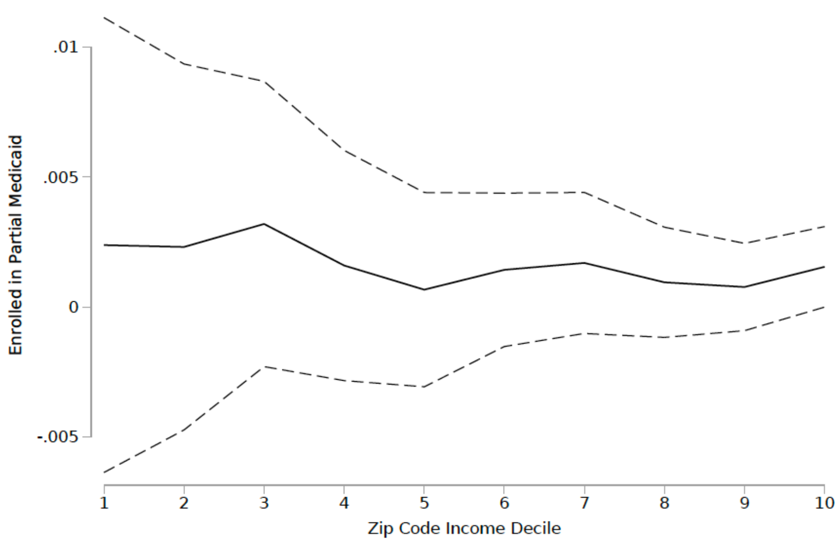


Appendix Figure 3: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Dual Medicaid, 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



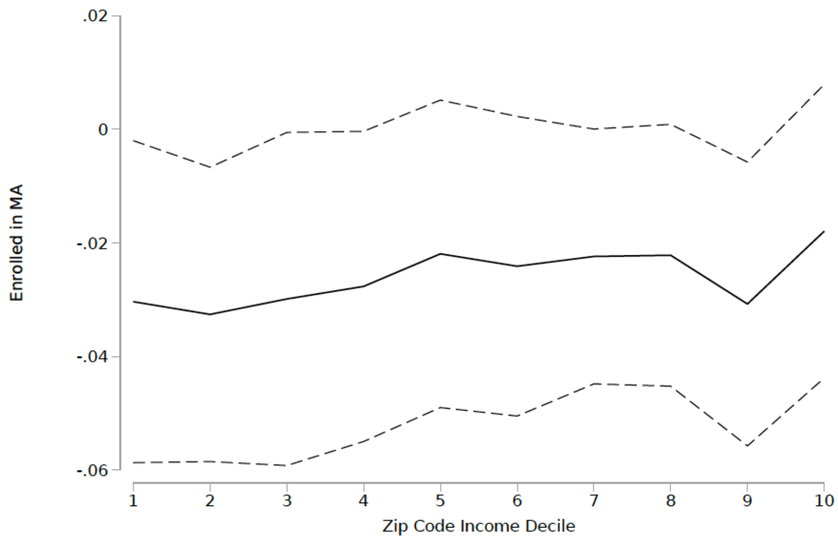
Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Figure 4: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Partial Medicaid, 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



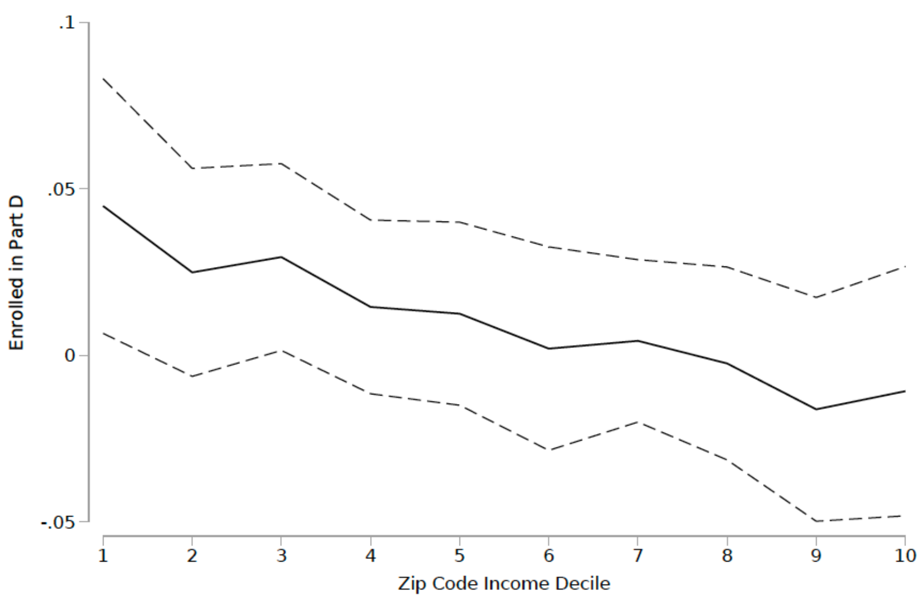
Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Figure 5: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Medicare Advantage, 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



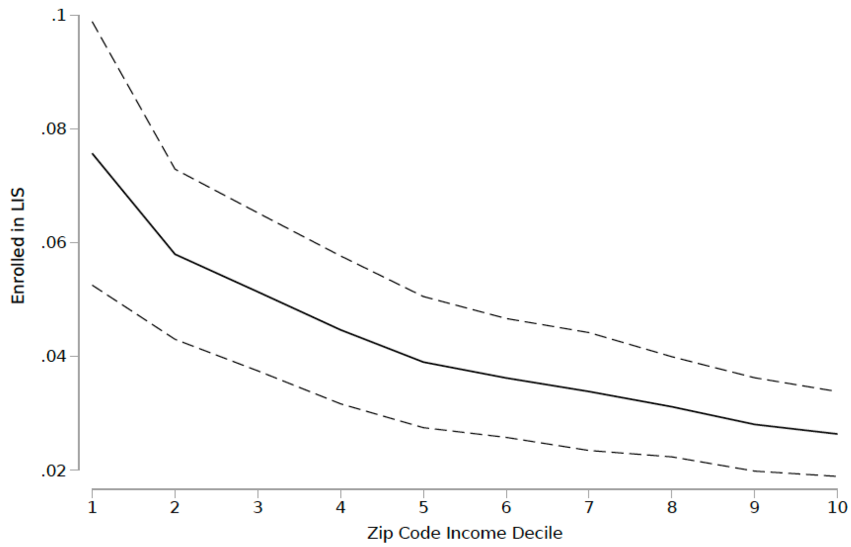
Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Figure 6: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Part D, 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



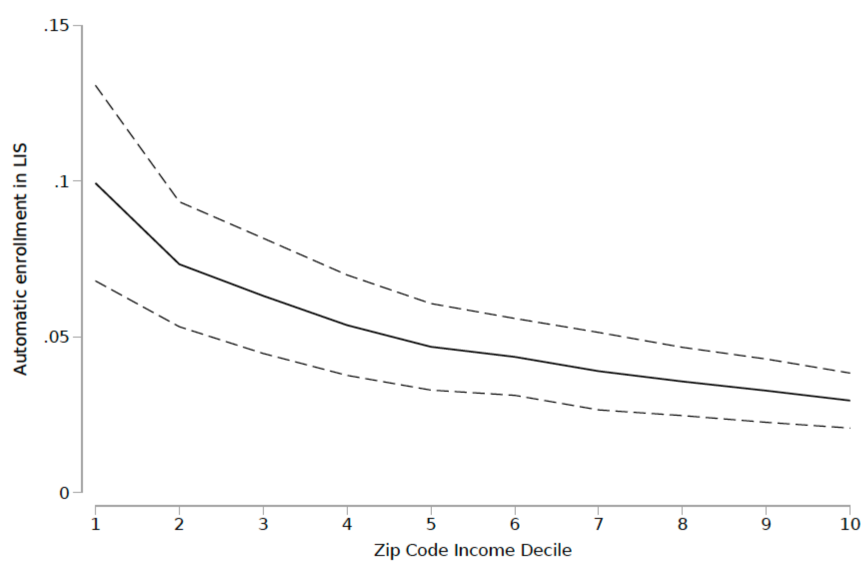
Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Figure 7: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Low Income Subsidy, 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



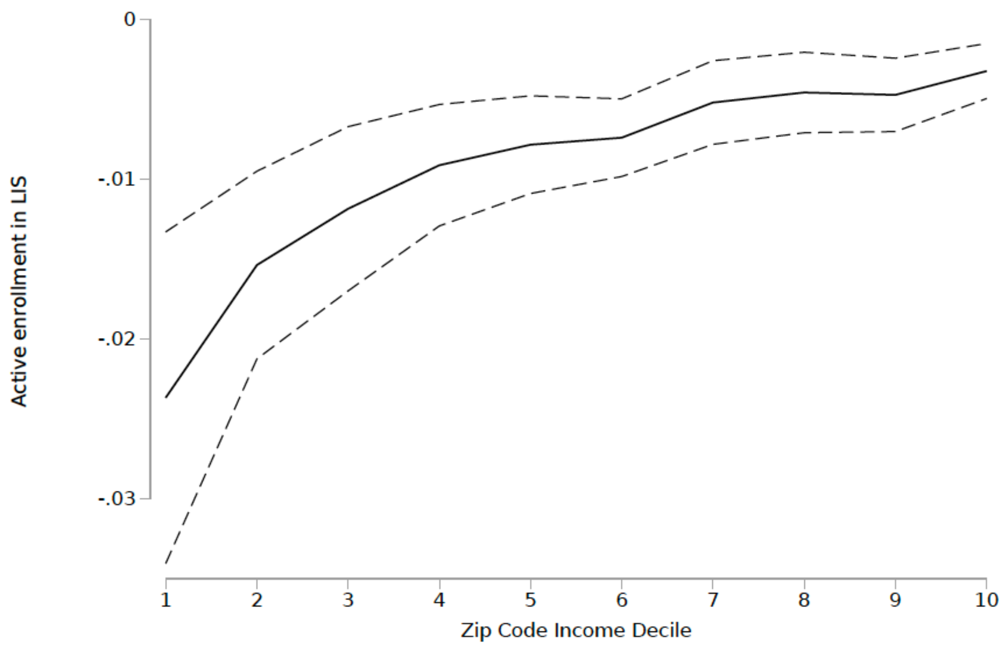
Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Figure 8: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Low Income Subsidy (Automatic Enrollment), 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Figure 9: Difference-in-Differences Coefficient Estimates, Likelihood Beneficiary Enrolled in Low Income Subsidy (Active Enrollment), 65-Year-Old Medicare Beneficiaries, By Zip Code Income Decile 2010-2017



Notes: N=16,223,075. Regressions include controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American, Native American, Unknown race or ethnicity; white is the left out category), and state and year fixed effects. Standard errors clustered by state. Graph depicts coefficient estimates and 95-percent confidence interval of equation (1) estimated for each decile in the distribution of zip code income.

Appendix Table 1: Balance Test, Means from 2010-2013, Insurance Sample

	All states	Expansion states	Non-expansion states	Difference
Mean AGI in zip code (thousands)	29.81	29.87	29.75	0.12***
	(3.41)	(3.41)	(3.4)	
Female	0.55	0.55	0.55	-0.00**
White	0.52	0.51	0.53	-0.02***
Black	0.32	0.28	0.35	-0.06***
Hispanic	0.08	0.10	0.07	0.03***
Asian	0.03	0.04	0.01	0.03***
Native American	0.01	0.01	0.01	0.00*
Other Race	0.04	0.05	0.03	0.02***
Unknown Race	0.02	0.02	0.01	0.01***
Enrolled in Dual Medicaid	0.22	0.25	0.18	0.06***
Full Medicaid	0.17	0.22	0.11	0.11***
Partial Medicaid	0.05	0.02	0.07	-0.05***
Enrolled in Medicare Advantage	0.27	0.27	0.27	0.00
Part D	0.51	0.53	0.49	0.03***
Enrolled in LIS	0.25	0.28	0.22	0.06***
Automatic enrollment in LIS	0.2	0.24	0.17	0.07***
Active enrollment in LIS	0.05	0.04	0.05	-0.01***
N	652,808	328,052	324,756	

Appendix Table 2: Balance Test, Means from 2010-2013, TM Spending and Utilization Samples

	All states	Expansion states	Non-expansion states	Difference
Mean AGI in zip code (thousands)	29.91	29.90	29.93	-0.03***
	(3.3824)	(3.4337)	(3.3296)	
Female	0.53	0.53	0.53	0.0003
White	0.52	0.50	0.54	-0.04***
Black	0.32	0.29	0.35	-0.05***
Hispanic	0.08	0.10	0.06	0.04***
Asian	0.02	0.04	0.01	0.02***
Native American	0.01	0.01	0.01	0.00
Other Race	0.04	0.05	0.03	0.02***
Unknown Race	0.02	0.02	0.01	0.001***
Inpatient spending ($)				
Total spending	181.60	192.13	170.96	21.17***
Total Medicare spending	160.20	171.61	148.65	22.96***
Total non-Medicare spending	21.41	20.51	22.31	-1.79
Outpatient spending ($)				
Total spending	205.69	206.70	204.67	2.03
Total Medicare spending	145.38	146.36	144.38	1.98
Total non-Medicare spending	60.31	60.33	60.29	0.05
Inpatient utilization				
Number of events	0.02	0.02	0.02	0.0002
=1 if any events	0.05	0.05	0.06	-0.003***
Number of events, if any	0.42	0.43	0.40	0.02***
Outpatient utilization				
Number of events	1.97	1.92	2.03	-0.12***
=1 if any events	0.50	0.48	0.51	-0.03***
Number of events, if any	3.97	3.96	3.98	-0.02
N	477,487	240,066	237,421	

Appendix Table 3: Balance Test, Means from 2010-2013, Part D Spending and Utilization Samples

	All states	Expansion states	Non-expansion states	Difference
Mean AGI in zip code (thousands)	29.60	29.71	29.48	0.23***
	(3.48)	(3.4442)	(3.5143)	
Female	0.60	0.59	0.60	-0.01***
White	0.50	0.50	0.51	-0.01***
Black	0.30	0.27	0.35	-0.08***
Hispanic	0.10	0.12	0.09	0.03***
Asian	0.03	0.05	0.01	0.04***
Native American	0.004	0.005	0.004	0.0003
Other Race	0.04	0.05	0.02	0.02***
Unknown Race	0.02	0.02	0.01	0.01***
Spending ($)				
Total spending	139.96	145.18	134.31	10.87***
Total Medicare spending	106.18	114.69	96.97	17.72***
Total non-Medicare spending	34.99	36.75	33.09	3.66***
Utilization				
Number of 30-day fills	2.93	2.92	2.93	-0.01
=1 if any 30-day fills	0.77	0.76	0.77	-0.02***
Number of 30-day fills, if any	3.82	3.86	3.78	0.08***
N	333,392	173,197	160,195	

Appendix Table 4: Examining Whether Insurance Effects Reflect New Enrollment or Earlier Enrollment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Enrolled in Dual Medicaid	Enrolled in Full Medicaid	Enrolled in Partial Medicaid	Enrolled in Part D	Enrolled in LIS	Automatic enrollment in LIS	Active enrollment in LIS
Panel A: Baseline results - Low-income zip codes, excluding 2014 (N=1,234,963)							
Post x Expansion	0.090***	0.088***	0.002	0.045**	0.076***	0.099***	-0.024***
	(0.012)	(0.013)	(0.004)	(0.019)	(0.012)	(0.016)	(0.005)
Pre-treatment treated mean	0.25	0.22	0.02	0.53	0.28	0.24	0.04
% change	36.3	39.2	9.7	8.5	27.1	41.5	-58.8
Panel B: Medicare enrollees with 7-12 months on Medicare (N=617,357)							
Post x Expansion	0.080***	0.080***	-0.0004	0.038**	0.064***	0.091***	-0.028***
	(0.012)	(0.012)	(0.004)	(0.020)	(0.010)	(0.015)	(0.007)
Pre-treatment treated mean	0.27	0.24	0.03	0.57	0.31	0.26	0.05
% change	29.8	33.4	-1.3	6.8	20.8	35.4	-58.3

Note: Each regression controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American Native American, other, and unknown; non-Hispanic white is the left-out category), and state and year fixed effects. Standard errors are clustered by state. * p<0.10, ** p<0.05, *** p<0.01.

Appendix Table 5: Robustness of Baseline Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Enrolled in Dual Medicaid	Enrolled in Full Medicaid	Enrolled in Partial Medicaid	Enrolled in Part D	Enrolled in LIS	Automatic enrollment in LIS	Active enrollment in LIS
Panel A: Baseline results - Low-income zip codes, excluding 2014 (N=1,234,963)							
Post x Expansion	0.0901***	0.0878***	0.0024	0.0449**	0.0757***	0.0994***	-0.0237***
	(0.012)	(0.0125)	(0.0043)	(0.019)	(0.0115)	(0.0156)	(0.0051)
Panel B: Low-income zip codes, including 2014 (N=1,415,135)							
Post x Expansion	0.0806***	0.0781***	0.0025	0.0404**	0.0675***	0.0889***	-0.0214***
	(0.0117)	(0.0122)	(0.0039)	(0.0184)	(0.0107)	(0.0146)	(0.0047)
Panel C: Low-Income zip codes excluding 2014 and early expansion states (N=1,131,346)							
Post x Expansion	0.096***	0.0912***	0.0048	0.0524**	0.0838***	0.1087***	-0.025***
	(0.0117)	(0.0135)	(0.0045)	(0.0203)	(0.0095)	(0.0142)	(0.0057)

Note: Each regression controls for sex, race/ethnicity (non-Hispanic Black, Hispanic, Asian American Native American, other, and unknown; non-Hispanic white is the left-out category), and state and year fixed effects. Estimates in Panel C exclude beneficiaries in DE, DC, MA, NY, and VT, states that had coverage for childless adults prior to 2014 (as in, e.g., Miller and Wherry, 2017 and Ghosh et al., 2019). Standard errors are clustered by state. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

Appendix A: Impact of Mortality Reductions Before Age 65 on Sample Composition

Given evidence of a reduction in mortality among older adults who become eligible for Medicaid before they turn 65 (Miller, Johnson, and Wherry 2021), we would ideally test whether there were differential changes in mortality in the years just before turning age 65. If such effects are present, it may imply selection that could affect the composition of the sample reaching age 65 differentially in states with and without expansions. For example, the population enrolling in Medicare could be less healthy due to enhanced survival pre-Medicare enrollment of the marginal patient. Unfortunately, we do not have data that would enable us to do this; for example, we do not have access to the restricted use ACS linked to the Census Numident file (which captures date of death for individuals with a Social Security Number) as was used by Miller et al. (2021).

Even though we are unable to conduct our preferred test, we argue that expansion-induced reductions in mortality prior to age 65 are unlikely to meaningfully affect our sample composition. This is because, although the prior literature has found the Medicaid expansion led to reductions in the likelihood of mortality among older adults, the estimated number of lives saved is small relative to the number of individuals who turn 65 and enroll in Medicare each year and the aging of the baby boom generation is likely to overwhelm any effect of increased survival.

The average number of people newly age-eligible for Medicare (65-year-olds in low-income zip codes in expansion states) each year is 114,413, and once the Baby Boomers begin to turn 65 in 2011, there are approximately 5,400 additional 65 year olds each year. In contrast, Khatana et al. (2019) estimate that the ACA Medicaid expansions led to 2,039 fewer cardiovascular deaths per year among adults ages 45 to 64 residing in expansion states and Miller, Johnson, and Wherry (2021) estimate that there are approximately 4,800 fewer deaths from any cause per year among adults ages 55 to 64 in expansion states. If these deaths were evenly spread throughout the age groups, it would result in between 102 and 480 fewer deaths among 64-year-olds each year. So, we believe that the reduction in deaths is unlikely to have a detectable effect on the health status of our study population because the number of lives saved is small relative to the number of new 65-year-olds, which is likely to overwhelm any reduction in mortality.