Reducing Ordeals through Automatic Enrollment: Evidence from a Health Insurance Exchange

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Abstract

Incomplete take-up is a major concern in safety net programs, including health insurance. Studying a targeted auto-enrollment policy in Massachusetts, we find that removing hassles through a simple shift in defaults has substantial impacts, boosting enrollment 30-50% and differentially enrolling young, healthy, low-cost individuals. While auto-enrollment worsens targeting according to the classic criterion – enrolling people with lower *value* for insurance – this criterion is incomplete because low (private) value is correlated with low public cost and misses uncompensated care spillovers. Relative to subsidies, auto-enrollment has similar targeting properties but is 36-125% more cost-effective by avoiding new spending on inframarginal enrollees.

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1 Introduction

The large impact of automatic enrollment is one of the best known results in behavioral economics. An influential body of research finds that defaults matter tremendously (Thaler, 2018) and that shifting from an "opt-in" to an "opt-out" default can substantially increase take-up in contexts like pensions, savings programs, and organ donation.[1] Based on these findings, there is growing interest in using auto-enrollment and "smart defaults" more generally in the context of health insurance. Like other settings where auto-enrollment has a large impact, health insurance features imperfectly informed consumers (Abaluck and Gruber, 2011; Handel and Kolstad, 2015; Bhargava, Loewenstein and Sydnor, 2017) who often act in a passive or inertial way (Handel, 2013; Ericson, 2014; Polyakova, 2016). Moreover, incomplete take-up of health insurance is a major U.S. policy challenge, with an estimated 57% of the 30 million uninsured Americans qualifying for free or subsidized coverage under the Affordable Care Act (ACA) but failing to take it up (Garfield, Orgera and Damico, 2019). Despite this, there is little formal causal evidence on the implications of auto-enrollment for health insurance take-up.[2]

A central reason defaults matter is that deviating from them requires taking action in a formal administrative process, which can be a hassle. Seen in this way, auto-enrollment is an example of a class of policies that reduce hassles, or non-price "ordeals," of public program enrollment. There is growing evidence that reducing ordeals – through policies like outreach, informational simplification, and enrollment assistance – can increase take-up of health insurance (Domurat, Menashe and Yin, 2021; Ericson et al., 2019) and safety net programs more generally (Bhargava and Manoli, 2015; Alatas et al., 2016; Finkelstein and Notowidigdo, 2018; Deshpande and Li, 2019).

But an important question raised by this literature is whether removing ordeals increases take-up in a way that is efficient. The classic analysis of Nichols and Zeckhauser (1982) shows that keeping ordeals can be efficient if they target transfers to people who need them most, allowing the savings to be reinvested in more generous benefit levels. While recent work has questioned this logic, often on the grounds that the psychological hassle costs of ordeals are larger for people experiencing poverty (Marianne Bertrand, Sendhil Mullainathan and Eldar Shafir, 2004), there is little evidence on this targeting issue for the case of health insurance. Moreover, auto-enrollment is a more extreme example of hassle reduction than in previously studied policies. Auto-enrollment not only removes barriers to enrolling, it makes it a *hassle to opt-out* of the program. Whether it increases health insurance enrollment in a well-targeted way – especially given the presence of alternatives like job-based insurance – is an important and unknown question for understanding the public economics of auto-enrollment.

In this paper, we study the impact of default enrollment using policy variation in a health insurance exchange in Massachusetts. Broad-scale health insurance auto-enrollment has traditionally been difficult to implement because of the challenge of screening eligible vs. ineligible people in the fragmented

[1] See Madrian and Shea (2001) on pension take-up, Beshears et al. (2009) on savings choices, and Abadie and Gay (2006) on organ donation programs

[2] Automatic enrollment is used in a variety of health insurance contexts, including enrollment of Social Security beneficiaries into Medicare at age 65, Medicaid beneficiaries into Medicare Part D's low-income subsidy program at age 65, and (in a broader sense) citizens into national health insurance systems in many OECD countries. However, the *causal effect* of these policies is rarely studied because of a lack of policy variation. There is some observational evidence in the health policy literature on the implementation of auto-enrollment in state Medicaid programs (DeLeire et al., 2012; Hoag et al., 2013), but we are not aware of research evaluating its causal impact using policy changes.

U.S. health insurance market. We examine a more modest "targeted" auto-enrollment policy that uses default rules for low-income people who have already applied and qualified for fully subsidized (free) coverage. In a second step, these applicants are contacted by the exchange to choose among several health plans. One possible default at this step is *non-enrollment* – people who fail to respond do not get enrolled. The policy we study shifts the default to *automatic enrollment* – letting people actively choose but auto-enrolling "passive" individuals in a state-selected plan after a period of non-response. Passive enrollees can actively opt out or switch plans afterward, but until they do so (or otherwise lose eligibility), they are enrolled in insurance by default.[3] In the language of ordeals, the default policy removes the hassle cost of requiring applicants to actively choose a plan to get enrolled. Although responding is relatively simple – it can be done online, by phone, or by mail – and all plans are free, past research on auto-enrollment suggests that even minor hassles can matter a lot.

To estimate the causal impact of this default policy, our paper uses a natural experiment created by a 2010 policy change from an auto-enrollment default (prior to 2010) to a non-enrollment default (in 2010+). We use administrative enrollment data linked to insurance claims to make three main contributions. First, we estimate the causal impact of the default policy on exchange enrollment, finding that it substantially increases take-up. Second, we examine the targeting implications of default enrollment, connecting our findings to the standard Nichols and Zeckhauser (1982) logic for the efficiency of ordeals for welfare programs. Finally, we apply our evidence to a public economic framework that lets us compare the efficiency of auto-enrollment to other take-up policies like larger financial subsidies.

Our paper's first contribution is to provide evidence on the causal impact of the default enrollment policy in our setting, which is Massachusetts' pre-ACA subsidized health insurance exchange (a program known as "CommCare"). Like the ACA exchanges that followed it, CommCare offered heavily subsidized private plans to low-income, non-elderly adults without access to other public or job-based health insurance. Because of these criteria, eligible individuals who do not take-up CommCare will be uninsured (at least initially). We draw on a natural experiment created by the suspension of auto-enrollment at the start of fiscal year 2010.[4] The default policy applied when individuals newly apply for coverage, so our main estimates are for the flow of new enrollees into the program. To control for any concurrent shocks, we use a difference-in-difference analysis that compares outcomes for the low-income group subject to auto-enrollment (incomes below 100% of the poverty line) versus a somewhat higher-income control group (100-200% of poverty) not subject to the policy.

We find a 32.6% decline in new enrollment when auto-enrollment ends in 2010. In the reverse direction, this suggests that implementing auto-enrollment would increase new enrollment by 48% (=0.326/(1-0.326)). The enrollment decline is immediate and persistent, with parallel pre-trends and

[3] Though less familiar for health insurance, this targeted policy is similar to how auto-enrollment works in employer contexts. For instance in 401(k) pensions, individuals first must "qualify" by being hired and working for an initial period. The employer then asks the worker to enroll and choose a contribution amount and investment portfolio. If they fail to respond in this "second step," the worker is auto-enrolled at employer-chosen specifications until they opt out or actively make a change.

[4] Underscoring the role of fiscal tradeoffs, the exchange suspended auto-enrollment, which had been in place since the program's inception in 2007, in order to close a budget shortfall without cutting benefit generosity or reducing subsidies. We find that the change did save money, reducing the state's spending by about 15%.

no change for the control group. Moreover, we see no evidence of an uptick in active enrollment after the policy change – something we would expect if passive enrollees were strategically *choosing* passivity because they know they will be auto-enrolled. Based on this evidence, auto-enrollment does not appear to crowd out active choice; instead, under a non-enrollment default, passive individuals simply fail to take up health insurance. Using a simple model of the dynamics of participation, we estimate that the 48% persistent increase in the flow of new enrollees translates to 32% higher enrollment in steady state.

These findings indicate that a modest hassle – the need to contact the exchange to choose a health plan – can be a major deterrent to health insurance take-up among the poor. This is true even though (as we show) passive enrollees appear to get meaningful benefits from insurance, including risk protection and coverage of predictable care. Our results add to a growing set of findings that even modest price or non-price barriers lead to large reductions in insurance take-up in low-income groups (Laura Dague, 2014; Amy Finkelstein, Nathaniel Hendren and Mark Shepard, 2019). They also show how a simple default change can increase take-up in insurance exchanges like those in the ACA, which use a similar two-step active enrollment process as in post-2010 CommCare.[5] Notably, our estimated enrollment effects – essentially complete take-up among passive individuals, and a 30-50% increase in *total* enrollment – are an order of magnitude larger than the 1-6% point take-up impacts found in several recent experiments on informational outreach, reminders, and simplified processes to boost ACA take-up (Goldin, Lurie and McCubbin, 2019; Domurat, Menashe and Yin, 2021; Ericson et al., 2019). These suggest that while information and simplification matter, making enrollment *fully automatic* may be key to covering the remaining uninsured.

Why does a seemingly small hassle matter so much for enrollment? We provide suggestive evidence on the mechanisms involved. The institutional setup argues against stigma or lack of awareness – two commonly cited factors in work on welfare program take-up (Currie, 2006) – since everyone in our sample, including passive enrollees, has already actively applied (and qualified) for public insurance.[6] We find no evidence of "choice overload" explanations in which too many choices leads to passivity (Iyengar and Kamenica, 2010). The CommCare market has relatively few plan options (at most 4-5), and the passive rate does not vary across areas with varying choice set sizes – including areas with just a *single* plan. We also find only weak evidence for "transaction cost" factors like language barriers (proxied by immigrant status) and incorrect mailing addresses (proxied by subsequent changes). Instead, our evidence is more consistent with passive individuals misunderstanding take-up rules, forgetting to act, or simply "going with the flow" in their health insurance choices. Default

[5] While conceptually simple, there are important administrative/legal challenges in the ACA, including whether to limit auto-enrollment only to fully subsidized (free) plans and how to handle income changes that affect subsidies. Notably, the Medicaid program uses an auto-enrollment (or "auto-assignment") default quite similar to CommCare's pre-2010 policy. Though this policy has received little attention, the Kaiser Family Foundation (2015) estimates that 45% of Medicaid enrollees are auto-assigned in the median state. Our evidence suggests that removing this auto-enrollment default would substantially reduce Medicaid take-up.

[6] A natural question is why individuals manage to complete a (non-trivial six-page) benefits application but then become passive when asked to choose a plan. Based on our discussions with market participants, a possible explanation is that many people get assistance with the initial application from social workers or medical staffers, often just after seeking care while uninsured. By contrast, individuals must take *independent* action to select a plan. This suggests that the *context* for an ordeal (not just its content) may be central for its impact on take-up.

enrollment is powerful because it flips the script on the requirement to take action: instead of being a hassle, enrollment becomes easy and *opting out* is a hassle.

Our paper's second main contribution is to provide evidence on the targeting implications of default enrollment. Core to our analysis is the idea that auto-enrollment removes a type of "ordeal," or non-price barrier, to take-up. We situate our findings in the longstanding debate over whether ordeals improve the targeting efficiency of transfer programs. The seminal analysis of Nichols and Zeckhauser (1982) shows conditions under which ordeals can improve targeting efficiency. The key idea is that ordeals screen out individuals with *lower value* of the benefit – i.e., those who need it less and are therefore less willing to jump through hoops to enroll. By saving money on reduced enrollment (in our case, eliminating the passive enrollees), the government can direct the funds towards more generous benefits for those willing to complete the ordeal. While a growing literature has questioned this self-screening idea, often on behavioral economics grounds, the basic logic is quite powerful.

Our findings are in part consistent with the standard self-selection logic but also show its limits in the context of insurance. On the one hand, we find that passive enrollees *do* have characteristics consistent with lower demand for (i.e., expected value of) health insurance. Demographically, they are younger (by 4 years on average) and healthier (e.g., 34% less likely to be chronically ill), with a particularly large share of young men age 19-34 (a group sometimes called "young invincibles"). Passive enrollees are also enrolled for shorter durations, and especially likely to have brief spells of 1-3 months, consistent with a shorter need for state-funded coverage (e.g., between jobs). Although these differences are not uniform – a meaningful share of passive types are older, chronically ill, and enrolled for long periods – they are consistent with ordeals screening out low-value types on average.

Importantly, while these characteristics suggest lower private value of insurance, they also imply lower cost of providing it. Consistent with their better health, passive enrollees incur 44% lower average medical spending per month enrolled. Similarly, their shorter durations imply fewer months of state-funded subsidies. This correlation between value and cost is a key feature of insurance and has important implications for the economics of ordeals. The standard ordeals model focuses on cases where public cost is *constant* across recipients within observable categories – e.g., think of slots in a free childcare program, or food stamps benefits conditional on income. With constant cost, ordeals that screen out low-value types also screen out people with *low efficiency*, that is low value per dollar of cost. If on the other hand low value correlates with low costs – as is generally true for insurance programs – the efficiency case is much less clear. Even if ordeals screen out low-value types, it is far from clear that they screen out inefficient enrollees.[7]

Beyond this main finding, we investigate two other factors relevant to targeting for health insurance. The first is duplication of coverage: the possibility that defaults (inappropriately) enroll people who already have other health insurance, for whom public insurance is in a sense unnecessary. Although this is a serious concern for auto-enrollment in general, we find it to be a minor factor in our setting. Using the state's All-Payer Claims Database, we find low duplication rates (3-4 percent) that appear if

[7] This logic is closely connected to the standard reason that adverse selection leads to inefficiently low trade in selection markets. A fixed price tends to screen out low-demand (low-WTP) consumers, which does not equate with low gains from trade (WTP minus cost). Just as adverse selection on price motivates financial subsidies, adverse selection *on hassles* motivates removing ordeals to make enrollment easier.

anything to be lower for passive enrollees. The second factor is charity care, a social cost of uninsurance that makes the net cost of formal insurance less than its gross cost (Amy Finkelstein, Neale Mahoney and Matthew J Notowidigdo, 2018). We find that passive enrollees get a larger share of their care from standard sources of charity care, including emergency rooms and safety net providers. This is consistent with their lower demand for insurance but also the idea that their net cost of formal insurance is particularly low. Thus, on these two issues as well, we find little evidence that active enrollment is a desirable ordeal.

Our paper's third main contribution is to apply our evidence to a public economic framework to evaluate the tradeoffs of auto-enrollment, especially compared to subsidies. To do so, we adapt the "marginal value of public funds" (MVPF) framework of Hendren (2016) to the health insurance setting. A key premise is that auto-enrollment (and "nudge" policies in general) can be thought of as a type of *investment* in greater insurance coverage. Even though changing the default has little direct cost, the resulting increase subsidized insurance enrollment implies that the true impact on public spending is substantial (i.e., there is a large "fiscal externality").[8] Simply put, if auto-enrollment is *effective*, it will also be *expensive*. We use the MVPF framework to assess how its efficiency compares to alternate ways of increasing insurance take-up.

We compare our impacts of default enrollment to estimates for subsidy increases drawn from past work on the same Massachusetts market (Amy Finkelstein, Nathaniel Hendren and Mark Shepard, 2019). We find that the marginal enrollees (i.e., targeting properties) of the two policies are similar: both enroll a similar young, healthy, and low-cost population. However, auto-enrollment has a 36-125% advantage in terms of its *cost effectiveness* – i.e., a much lower public cost per newly insured person. This advantage comes from a straightforward fact: auto-enrollment requires no new spending on inframarginal enrollees, while subsidies spend a good deal on discounts for inframarginal enrollees. In essence, auto-enrollment works like a highly targeted take-up policy for marginal enrollees, while subsidies combine this with a cash transfer to inframarginal people. If the MVPF of insurance exceeds that of cash transfers, auto-enrollment will also have a higher MVPF.

This finding suggests that given limited budgets, policies that prioritize making health insurance enrollment easy and automatic are relatively cost effective compared to subsidy policies that focus on affordability. A policymaker facing a choice between auto-enrollment versus larger subsidies – as Massachusetts did in 2010 when it suspended auto-enrollment to close a budget shortfall – could increase coverage more at the same public cost via auto-enrollment. Of course, when budgets are less tight, generous subsidies and auto-enrollment may be *complementary* policies, since auto-enrollment is more administratively (and politically) feasible when insurance is fully subsidized.[9] Our paper does not speak to the larger administrative and policy challenges of implementing auto-enrollment in settings like the ACA Marketplaces, an issue of active discussion (e.g., Dorn, Capretta and Chen, 2018; Young, 2019). Our results do suggest that if these challenges can be overcome, making the enrollment process

[8] This is in contrast with the standard framing of libertarian paternalism, which thinks of effects of defaults as limited to participants. Here, there is also a major impact on public spending.

[9] Auto-enrollment in non-free insurance is feasible only if the program has a mechanism to auto-collect premiums from non-reponsive individuals (e.g., via the tax system). Moreover, auto-enrollment in non-free insurance risks angering passive individuals who get signed up by mistake and end up with a large bill.

more automatic could have a major impact.

Outline of Paper Section 2 discusses the setting, the auto-enrollment policy, and our data. Section 3 shows our main results on the impact on enrollment, and section 4 presents descriptive results on targeting. Section 5 presents a conceptual model, and section 6 applies our evidence to the framework to understand the public economics of auto-enrollment versus subsidies. Section 7 concludes.

2 Background: Setting, Auto-Enrollment Policy, and Data

2.1 Massachusetts Exchange Setting

CommCare Exchange We study Commonwealth Care ("CommCare"), a subsidized insurance exchange in Massachusetts that operated from 2006-2013 before shifting form in 2014 at the ACA's implementation. CommCare covered low-income adults with family income below 300% of the federal poverty level (FPL, or "poverty") and without access to insurance from another source, including an employer or public program (i.e., Medicare or Medicaid). We focus on the population with income below 100% of FPL for whom the auto-enrollment policy applied. Given eligibility rules for other programs, this group is almost entirely childless adults age 19-64.[10]

CommCare offered generous insurance at heavily subsidized premiums. The program specified a detailed benefit structure (i.e., cost sharing rules and covered medical services) that private insurers were required to follows. Each insurer offered a single plan with the standardized benefits but could differ in its network of hospitals and doctors. For the below-poverty group we focus on, benefits were equivalent to Medicaid – i.e., broad coverage with essentially no patient cost sharing – and all plans were fully subsidized ($0 premium). This setup is quite similar to Medicaid managed care programs.[11] As in Medicaid, there is no financial cost to obtaining insurance, and the only barriers are enrollment hassles.

Application and Enrollment Process It is well known that there is substantial "churn" into and out of eligibility for different forms of health insurance – e.g., due to job changes, income fluctuation, or family status changes. Therefore, each month a significant number of individuals need health insurance and apply for public insurance. For CommCare, the enrollment process involves two steps. Step one is to apply for coverage. This requires completing a form that asks about income, demographics, family status, and access to other health insurance (see Appendix A.1 for snapshots of the six-page form). The state used this information to determine eligibility for Medicaid or CommCare (dual eligibility

[10] Medicare covers seniors age 65+, and Massachusetts Medicaid covered children up to 300% of FPL, parents with dependent children up to 133% of FPL, and pregnant women up to 200% of FPL. In addition to the non-elderly, CommCare covered a small number of immigrants age 65+ not eligible for Medicare. As we discuss below, we drop immigrant enrollees from our sample.

[11] Although similar to Medicaid, there is an important difference for retroactive coverage. Medicaid typically covers medical bills incurred *prior to enrollment*, typically with a 90 day retroactive period. As a result, eligible individuals have a form of "conditional coverage" even if they do not actively enroll. By contrast, CommCare (like the ACA exchanges) does not have retroactive coverage. Coverage starts the first day of the month *after* completing enrollment. Therefore, enrollment delays have a meaningful impact, including the risk of getting acutely ill and incurring medical bills.

should not occur), and to sort people into income-based subsidy groups in CommCare. Although the application form is a meaningful hassle, many individuals get help from a medical staffer or social worker in completing it. Indeed, enrollment assisters could guide an applicant through the entire process and submit the necessary information via an online form, without the applicant needing to take independent action.

The second enrollment step is to choose a plan. After determining eligibility, the state notified an individual (by mail and/or email) and provided information on available plans and associated premiums. Appendix A.1 shows this two-page notification letter. To complete enrollment, individuals were asked to choose a plan by calling, going online, or circling a plan choice and returning it by mail. Note that relative to the initial application, this choice step was quite simple. However, without auto-enrollment (discussed next), individuals still had to *take action* to enroll. Moreover, the action needed to be taken independently in response to a notification letter, which could be lost, misunderstood, or forgotten.

There was one important exception to this process near CommCare's start in 2006-07 when the state "auto-converted" a large population from its uncompensated care pool (UCP) based on information from their original UCP application, often months beforehand. Consistent with the long lag, many of these UCP individuals failed to respond and were auto-enrolled, creating a large spike in auto-enrollment in early 2007. Because of these distinct circumstances, we focus our main analysis on the "steady-state" auto-enrollment period (fiscal years 2008-09), with the initial period (2007) analyzed for comparison and robustness.

2.2 Auto-Enrollment Policy and Timeline

Auto-Enrollment Policy CommCare's auto-enrollment policy set the *default outcome* for people determined eligible (step one of the process) but who failed to actively choose a plan (step two). The policy applied only to below-poverty enrollees, for whom all plans were free.[12] This allowed regulators to borrow a policy widely used in Medicaid managed care that "auto-assigns" passive new enrollees into a state-selected plan. Aggregate statistics suggest that auto-assignment in Medicaid is very common: the median state auto-assigns 45% of new enrollees (Kaiser Family Foundation, 2015). However, we are not aware of any *causal* evidence on this policy's impact, likely because of a lack of variation in whether the policy is used.

Auto-enrollment applied when individuals entered the market, but with different rules for two groups: (1) "new enrollees" joining for the first time, and (2) "re-enrollees" joining after a gap in coverage. We focus our main analysis on new enrollees, who were mailed a coverage approval letter and given 14 days to actively choose a plan before being auto-enrolled if they failed to respond. This lets

[12] For above-poverty enrollees, premiums varied across plans, and most plans were non-free, raising legal concerns about auto-assigning a plan without an individual's consent – a legal barrier still relevant in the post-ACA context. There were, however, two exceptions when auto-assignment was used for enrollees in the 100-150% of poverty group. During fiscal year 2008 when this group had fully subsidized coverage ($0 in all plans), a large auto-enrollment was implemented in month 6 of the fiscal year (December 2007). For this reason, we start our use of 100-150% of poverty new enrollees as a control group only in fiscal 2009 when no auto-enrollment took place. Second, auto-enrollment was used for re-enrollees in the 100-150% of poverty throughout the pre-2010 period; for this reason, we limit our analysis to new enrollees only (see discussion below).

us observe mode of enrollment (active vs. passive) directly in our administrative data. By contrast, most re-enrollees were *immediately* auto-enrolled in their former plan (without a 14-day window), making it challenging to observe who would have actively enrolled. Auto-enrollment was also used for some higher-income re-enrollees (but not new enrollees), which means we cannot use them as a control group. For these reasons, we focus our main analysis on the cleaner new enrollee sample. Appendix B.2 analyzes the enrollment impacts on re-enrollees, finding roughly similar (though more complex) results.

All new/re-enrollees, including passive enrollees, could freely switch plans within 60 days of starting coverage. But in practice the vast majority (96% of passive and 98% of active enrollees) stick with their initial plan. This suggests that the default rule may have important impact on market outcomes. For new enrollees, official rules state that plan assignment was random, with a greater probability weight for insurers with lower (state-paid) prices. This scheme raises two interesting issues that we have largely not explored in this paper. First, random assignment could allow for inferring causal plan effects, as in recent work on Medicaid (Michael Geruso, Timothy J Layton and Jacob Wallace, 2020) and Medicare Part D (Brot-Goldberg et al., 2021). In practice, we find evidence of slight demographic imbalance across plans, suggesting the presence of hard-to-observe exceptions to random assignment.[13] We therefore have not pursued this topic further. Second, giving higher probability weights to lower-price insurers should affect *competitive incentives*. This topic is also interesting but would require a different research design to study; we therefore leave it for future work.

Policy Timeline We use auto-enrollment policy changes at the start of fiscal year 2010 (which ran from July 2009 to June 2010). Facing a Great Recession-related budget shortfall, CommCare needed to cut back. The program had raised enrollee premiums and copays at the start of 2009, and it was eager to avoid doing so again. Suspending auto-enrollment provided an alternative to reduce new enrollment and therefore subsidy spending. The exchange did so as of the start of fiscal 2010, with (because of a lagged impact) a final group of passive enrollees joining in 2010m1. These cuts proved quite effective, and CommCare unexpectedly came in under budget during 2010. As a result, the program temporarily reinstated auto-enrollment in the final three months of 2010. After this, facing continued budget pressures, it was permanently canceled.

These changes give us variation to estimate the causal impact of auto-enrollment. However, a potential concern is the possibility of other concurrent shocks or policy changes that affect enrollment. Based on background research and discussions with the exchange administrator, the only significant change at this time was an eligibility cutback for non-citizen enrollees taking effect in October 2009, two months after the auto-enrollment suspension. To avoid biasing our results, we exclude immigrant enrollees from our sample in all periods.[14] Aside from this, other enrollment-relevant variables (e.g.,

[13] One example that we know about is that new enrollees with recent enrollment in a *Medicaid* managed care plan that also operated in CommCare would be re-assigned to their previous plan. We do not have Medicaid data to pull out these enrollees.

[14] The eligibility change was for legal immigrant residents (typically green card holders) who had not yet cleared their "five-year bar" requirement to receive federal Medicaid matching funds – a group the state calls "aliens with special status" (AWSS). Starting in October 2009, the AWSS group was not eligible to newly enroll in CommCare, and existing AWSS enrollees were shifted into a parallel program. We observe a flag for AWSS status and enrollment in this parallel

premiums or covered benefits) did not change.[15] Nonetheless, to address any unobserved demand shocks, our method uses a control group of higher-income enrollees not subject to auto-enrollment.

2.3 Data and Descriptive Statistics

Our primary data come from CommCare administrative records for fiscal years 2007-2014 (spanning November 2006 to December 2013). For all individuals in the market, we observe a panel of individual-level demographics and monthly plan enrollment, linked to insurance claims and risk scores. Observed demographics include age, gender, zip code of residence, and income as a percentage of the poverty line. Insurance claims let us measure enrollees' medical conditions, and health care utilization and spending while enrolled. Crucially, the data include a flag for whether each enrollee entering the market actively chooses a plan or is auto enrolled. This lets us construct the key variables for our main analysis: monthly counts, characteristics, and outcomes for passive and active enrollees.[16]

We are interested in the policy's impact on enrollment totals and composition. For enrollment impacts, the main outcome of interest is counts of new enrollees per month (a flow measure). We use our panel data on duration enrolled to translate this into an effect on steady state enrollment (a stock measure). For composition, we use variables on demographics, diagnoses, and medical spending observed over the course of an individual's enrollment spell.

For context, we also draw on the Census's American Community Survey (ACS) to estimate the total CommCare-eligible and eligible uninsured population in the relevant income groups. We follow the method of Finkelstein, Hendren and Shepard (2019) to construct these estimates. Details are described in Appendix A.2.

We make several limitations to our main CommCare analysis sample. First, we limit attention to new enrollees, excluding "re-enrollees" for whom auto-enrollment rules were different (see discussion above). Second, we limit the sample to new enrollees who (when they joined the market) were in one of two income groups: (1) the 0-100% of poverty "treatment" group, and (2) a 100-200% of poverty "control" group not subject to auto-enrollment. Third, we exclude from our sample non-citizen enrollees who (as described above) faced an eligibility cutback in October 2009 to avoid conflating this with the effect of suspending auto-enrollment (in August 2009). Finally, we limit our sample post-period to new enrollees joining up to the end of fiscal 2011, since plan choice rules change significantly at the start of 2012 (see Shepard, 2016).

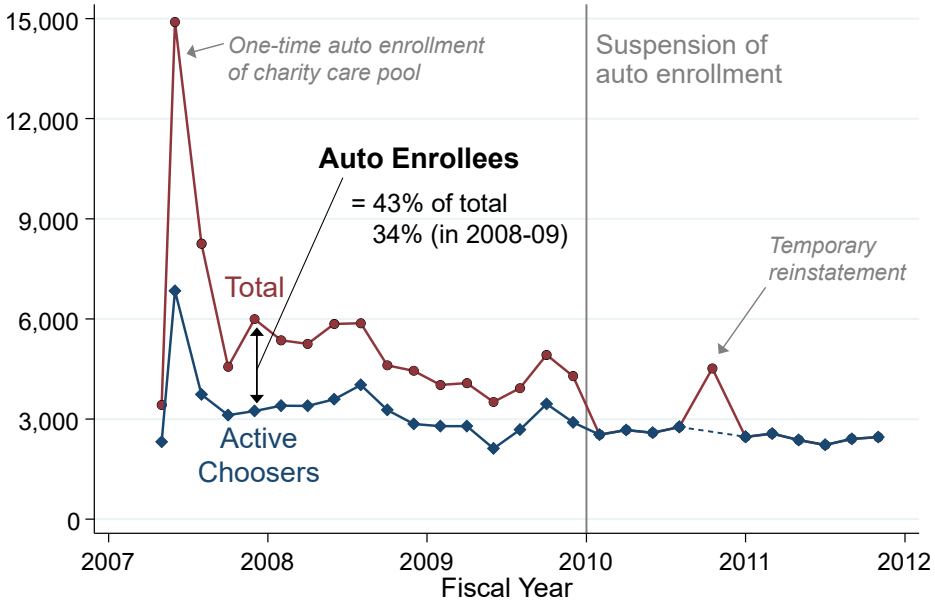
Descriptive Statistics Figure 1 shows data on the monthly flow of new enrollees in the treatment group (0-100% of poverty). It shows both total new enrollment (in red) and the count of active choosers

program, which lets us exclude these individuals from the sample in all periods.

[15] The start of 2010 did see the entry of a new insurer (CeltiCare). But for the below-poverty group, this simply expanded the choice set of available free plans, which should (if anything) increase enrollment, pushing in the opposite direction of our findings. In practice, CeltiCare had a narrow network and was not popular, with only 1.5% of below-poverty active choosers selecting it during 2010-11. We therefore view the new availability of CeltiCare as having a negligible impact.

[16] We observe this flag for the FY 2007-2009 period when auto-enrollment is in effect, but due to a technical issue, it is missing during the policy's temporary reinstatement in April-June 2010. For this latter period, we report only aggregate data for all enrollees.

Figure 1: Count of New Enrollees per Month (0-100% of Poverty): Active vs. Passive Enrollees



NOTE: The graph shows counts of new enrollees per month into the CommCare market for the <100% of poverty group subject to the auto-enrollment policy. Data points are bimonthly averages to average over fluctuations in the monthly count of new enrollees (see Appendix Figure A.1). The CommCare market starts in fiscal year 2007, and auto-enrollment is in place from 2007 to the end of 2009, plus a temporary reinstatement period at the end of 2010. The red series shows total new enrollment, and the blue series shows the count of "active choosers" who actively chose a plan when newly enrolling. The gap between these series represents the number of passive auto enrollees. The large spike in passive enrollment in 2007 comes from a one-time auto-enrollment of charity care pool enrollees (see discussion in Section 2.1). The dashed line for the blue series at the end of 2010 indicates that we lack data separating active vs. passive enrollees during this period.

(in blue), with the gap between these being passive enrollees. Passive enrollees represent a sizable 43% share of new enrollment over the 2007-09 period when the policy was in place. Passive enrollment was most common during 2007 (when the passive rate was 49%), driven by a spike in enrollment as the state auto-converted participants from its Uncompensated Care Pool into CommCare. By 2008-09, passive enrollees represent a more stable 34% of new enrollment. New enrollment falls sharply when auto-enrollment was suspended at the start of 2010. The decline is almost identical to the number of passive enrollees during 2008-09. Moreover, when the policy is briefly reinstated at the end of 2010, enrollment spikes up to a similar level as at the end of 2009. Together these facts are consistent with auto-enrollment having a causal effect roughly equal to the full number of passive enrollees in the pre-period.

Appendix Table A.1 further summarizes enrollment statistics, including enrollment counts for the 100-200% of poverty group and on total market enrollment and new- vs. re-enrollment. Appendix Table A.2 reports average consumer attributes; we defer a discussion of these to Section 4 where we compare active vs. passive enrollees.

3 Causal Impacts of Auto-Enrollment Policy

This section presents our estimates of the causal impact of auto-enrollment on the level and composition of enrollment. Section 3.1 presents impacts on exchange enrollment; Section shows impacts on market risk competition; and Section 3.2 provides context on the magnitude of the effects.

3.1 Impact on Market Enrollment

We use the 2010 policy change to estimate the causal impact of auto-enrollment. To do so, we run difference-in-difference (DD) regressions on counts of monthly new enrollment, comparing the 0-100% of poverty "treatment" group (for whom auto-enrollment is in place through 2009 and suspended in 2010) to the 100-200% of poverty "control" group (for whom auto-enrollment was never in place). The DD regression is:

$$NewEnr_{g,t} = \alpha_g + \beta_t + \gamma \cdot 1\{g = Treat, t \geq 2010\} + \varepsilon_{g,t} \tag{1}$$

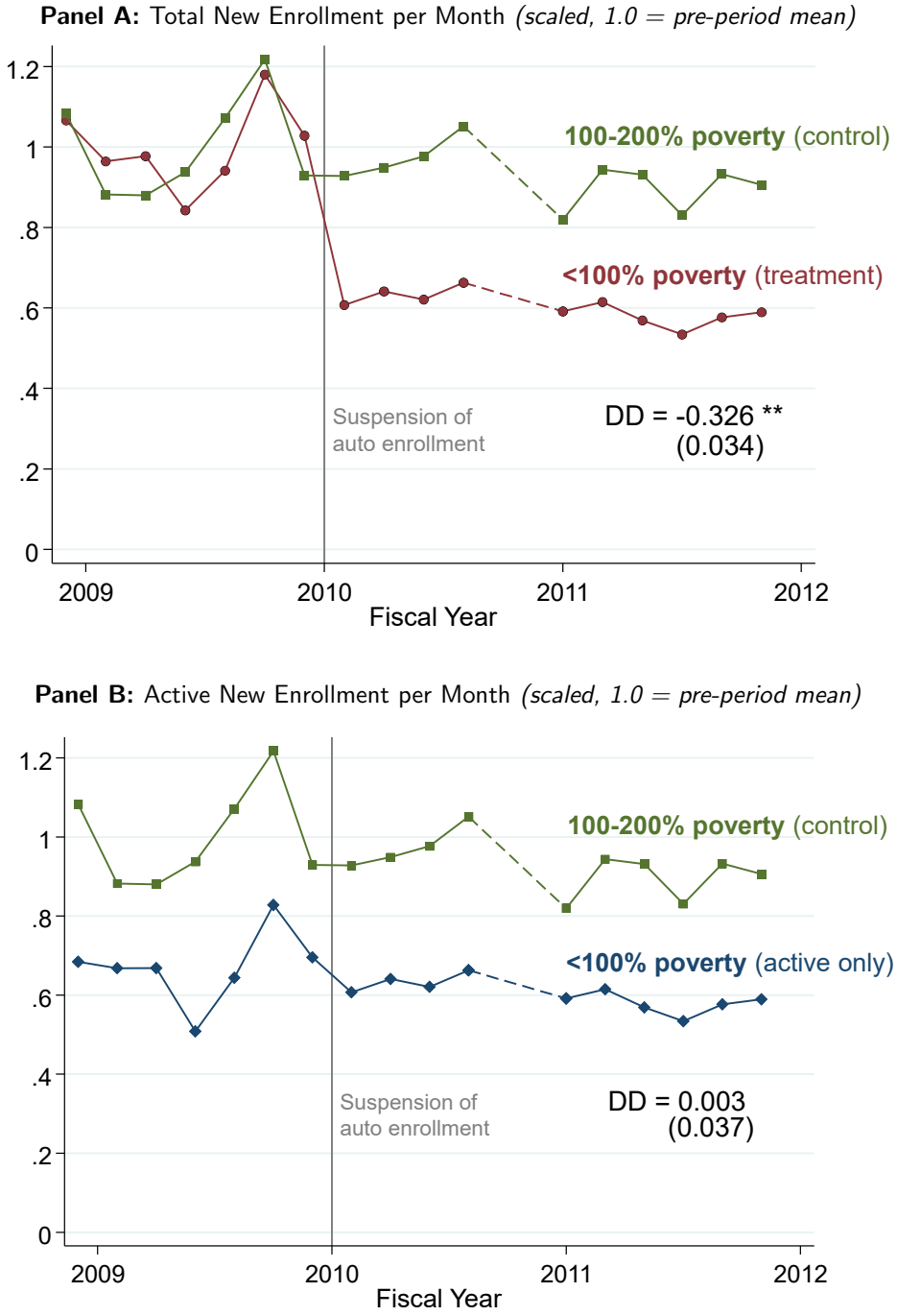
where $NewEnr_{g,t}$ is (scaled) new enrollment for income group g (treatment or control) at time t. We run (1) on data from 2009-2011, excluding the final months of 2010 when auto-enrollment was reinstated.[17] The dependent variable is *scaled* new enrollment, equal to raw new enrollment counts divided by group g's average monthly new enrollment in the pre-2010 period. This ensures that $NewEnr_{g,t}$ has a mean of 1.0 for each g in the pre-period, letting us more easily compare trends across the two (different-size) income groups and to interpret γ as a proportional change. The coefficient of interest is γ, which captures the DD estimate of the causal effect of turning off auto-enrollment.

Figure 2 plots the data for the regression in (1) and reports the main DD estimate (γ). Panel A shows results for total new enrollment (active and passive). Trends for the treatment and control groups are quite parallel in the pre-period, and enrollment drops sharply and persistently for the treatment group at the policy change. The DD estimate of $\gamma = 0.326$ implies that suspending auto-enrollment reduced the flow of new enrollment by 32.6% of the pre-period mean. In the reverse direction, turning on auto-enrollment increases new enrollment by 48.4% (= 0.326/(1-0.326)).

It is also relevant to understand the policy's impact on the *stock* of total enrollment. Because passive enrollees tend to stay enrolled for shorter durations (as shown below), the 48% increase in the flow of new enrollees translates to a smaller steady-state impact. Appendix B.3 presents and calibrates a simple stock-flow model to estimate this steady-state effect. We find that eliminating auto-enrollment reduces steady-state enrollment by 24% – or (in the reverse direction) adopting it increases enrollment by 32%. These estimates are also consistent with empirical enrollment patterns for the relevant group, which fall from about 61,000 people in late 2009 to about 47,000 over the next two years (see Appendix Figure A.6).

[17] We start the analysis in 2009 (rather than 2007 or 2008) because of subsidy changes affecting the control group at the start of 2009. The time unit (t) is bimonthly periods, averaging over new enrollment in the two months, which smooths over a few single months when auto-enrollment appears not to have occurred followed by a surge in auto-enrollment the next month (see Appendix Figure A.1).

Figure 2: Effect of Auto-Enrollment Suspension on New Enrollment (DD Estimates)



Note: The figure shows data on scaled new enrollment per month into the CommCare market and estimates of the difference-in-difference specification (1) for estimating the causal effect of the suspension of auto-enrollment at the start of 2010. Each panel compares trends for below-poverty enrollees (the treatment group, subject to auto-enrollment pre-2010) versus 100-200% of poverty enrollees (the control group, not auto enrolled). Each income group's series is rescaled by dividing by the group's pre-period mean new enrollment, which makes DD estimates interpretable as a percent change. Panel A shows that *total* new enrollment falls sharply (by 32.6%) for the treatment group at the start of 2010, consistent with a causal effect of the policy. Panel B shows that the number of *active* new enrollees is flat through the policy change, consistent with little "strategic" passivity.

(Lack of) Crowd Out of Active Enrollment In principle, auto-enrollment could affect not just *whether* people enroll but also *how* they enroll (actively vs. passively). Models of rational or "strategic" inattention suggest that some people may be passive because they know the stakes are low – CommCare's health plans are similar, and some people may be happy to let the state choose for them rather than incur a decision cost.[18] Without auto-enrollment, however, these strategically passive individuals would actively enroll to avoid being uninsured. Strategic passivity, therefore, would predict an uptick in active enrollment when auto-enrollment ends in 2010. Alternatively, passivity that is "exogenous" to the policy predicts little change in active enrollment; instead, people who would have been passively enrolled will simply fail to take-up insurance.[19]

Panel B of Figure 2 shows that there was essentially no change in the number of *active* new enrollees around the policy change, with a DD estimate of almost exactly zero ($\gamma = 0.003$).[20] We also see no evidence of an uptick in active enrollment in the two years following the policy change. Moreover, Appendix Figure A.2 shows that we do not see evidence of discrete changes in the average characteristics of active enrollees at the start of 2010, which one might expect if some people who would have been passive now actively enroll. For instance, although passive enrollees are younger and more likely to be male, we see no jump in the average age or share male of active enrollees in early 2010. These findings suggest that (at least in this setting) nearly all passive enrollment is exogenous, and the shift to auto-enrollment does not "crowd out" active plan choice. This finding is useful for our targeting analysis below because it suggests that a simple comparison of observed active vs. passive enrollees faithfully captures inframarginal vs. marginal enrollees due to the policy.

Robustness: Effects on Re-Enrollment The analysis so far has been limited to "new enrollees" who enter the exchange for the first time. The auto-enrollment policy also applied to "re-enrollees" (who re-enter the exchange after a break in coverage) but with a few differences in the policy rules. Appendix B.2 explains these details and separately analyzes the impacts on re-enrollment.[21] Despite the policy differences, we find qualitatively similar estimates of the impact of the policy change, with estimated reductions of 35-39% in the number of re-enrollees (vs. 33% for new enrollment). Based on these similar results, we conclude that our main estimates on new enrollees are representative of the

[18] Enrollees would plausibly have known about the auto-enrollment policy because the coverage approval letter informed them of it (reading, *"If you do not choose a health plan by [date], the Connector will choose one for you."*), even as it encouraged them to actively choose to get a plan that met their needs. After the policy change, this language was removed. Instead, enrollees were sent periodic reminder letters if they had qualified but not enrolled in coverage.

[19] A variety of underlying factors could lead to "exogenous" passivity, including lack of information/misunderstanding of the policy rules, barriers to take-up (e.g., language barriers, approval letter lost in the mail), or an indifference to having health insurance (despite having actively applied for it in step #1). We provide some suggestive evidence on these stories in Section 3.3 below.

[20] Active enrollment equals total enrollment for the control group and for the treatment group in the post-period, so these points are identical to Panel A. For the treatment group in the pre-period, Panel B shows the observed number of actively enrolling individuals, rescaled by the same factor as in Panel A.

[21] Briefly, there were two policy differences. First, re-enrollees who rejoined the exchange after a gap of ≤ 12 months were not given a chance to actively choose a plan; instead they were *automatically* auto-assigned to their prior plan. As a result, it is less meaningful to analyze active vs. passive re-enrollees (as in Figure 2), since the vast majority of re-enrollees with a ≤ 12 month break are coded as passively assigned. Second, the data indicate that re-enrollees with a ≤ 12 month gap (but not a 13+ month gap) in the 100-150% of poverty group are also passively assigned if their prior plan had a \$0 premium. Therefore, we need to restrict the control group to 150-200% of poverty only.

overall impact of the policy and focus on these in remaining analysis.

3.2 Context: Comparison to Other Take-up Policies

How should we interpret the magnitude of the impact of the auto-enrollment policy – a 48% increase in new enrollment and 32% increase in steady state enrollment? Several benchmarks can help put this estimate in context. First, relative to other "nudge" interventions to increase health insurance take-up, these are very large impacts. For instance, several recent experiments in ACA exchanges have tested nudges like reminder mailings/phone calls, simplified plan information, and a simpler take-up process (Domurat, Menashe and Yin, 2021; Ericson et al., 2019; Myerson et al., 2021). These studies find take-up impacts of 1-6 percentage points among a similar passive population (people who have qualified for coverage but not chosen a plan).[22] By contrast, our auto-enrollment policy leads to an order of magnitude larger impact: nearly complete take-up among the passive group and a 30-50% increase in the *total* enrolled population. These results suggest that while information and simplification matters, *making enrollment the default* is critical to substantially boost take-up.

A second benchmark is the impact of financial incentives. Our estimated 32% steady-state impact of auto-enrollment is nearly identical to the 33% impact of reducing premiums by $38-39 per month (a 57% reduction on average) in prior evidence from the same Massachusetts setting (Amy Finkelstein, Nathaniel Hendren and Mark Shepard, 2019). It is somewhat larger than the 20-26% impact of introducing Massachusetts' uninsurance penalty (Amitabh Chandra, Jonathan Gruber and Robin McKnight, 2011; Sonia Jaffe and Mark Shepard, 2020).[23] Therefore, auto-enrollment has a similar impact as substantial changes in financial incentives.

Despite its large impact, the *targeted* nature of the auto-enrollment policy (applying only to people who had already qualified for coverage) meant that its impact on overall uninsurance was limited. Using ACS data, we estimate that Massachusetts had about 300,000 uninsured people in 2009, of whom about 62,000 qualified for CommCare and had incomes below poverty. Relative to this denominator, auto-enrollment's 14,900-person impact (see Appendix B.3) is about a 12% increase in take-up.

3.3 Mechanisms: What is the Barrier to Active Take-Up?

Why do passive enrollees fail to take up free health insurance in the face of a seemingly small ordeal – contacting the exchange to choose a health plan? In this section, we discuss and provide suggestive evidence on some mechanisms that could be involved.

[22] Jacob Goldin, Ithai Z Lurie and Janet McCubbin (2019) study a similar mailing outreach intervention on uninsured individuals identified in tax filings. They likewise find a modest take-up impact of +1.1 percentage points, though even this small impact led to a meaningful decline in mortality among the marginally insured.

[23] Evidence from the ACA – which involves a somewhat higher-income population than in CommCare – suggests smaller impacts of both subsidies and penalties. Molly Frean, Jonathan Gruber and Benjamin D Sommers (2017) find that each 10% point increase in non-group subsidies – about $67 per month given the average premiums they report – increased Marketplace enrollment by about 10% relative to the pre-ACA non-group enrolled population (or by about 0.89% of the total population). The 32% effect of auto-enrollment would translate to a subsidy of >$200 per month. Ithai Z Lurie, Daniel W Sacks and Bradley Heim (2019) find a relatively small impact of increases in the ACA's uninsurance penalty, perhaps because it was not fully enforced.

Table 1: Tests of Choice Overload: Passive Rate vs. Choice Set Size

Panel A: Cross-Area Relationship			**Panel B: Diff-in-Diff**	
# of Plans Available	Passive Rate	Sample Size (new enrollees)	Outcome: Passive Rate	
1	33.9%	6,696	ΔPlans*Post	-0.014
2	34.5%	5,009		(0.011)
3	35.2%	50,886	Num Obs.	
4	32.9%	46,103	(area-months)	874
Avg	*34.1%*	*108,694*		

NOTE: The table shows the relationship between the passive enrollment rate and the choice set size for the 2008-09 period, as a way of testing "choice overload" as an explanation for passive behavior. The choice set varies across areas and over time because of insurer participation decisions. Each of four insurers operating in CommCare offers a single plan, but they can choose whether the plan is available in 38 "service areas" of the state. Panel A shows the cross-sectional relationship between number of plans available and the passive rate. Panel B shows a difference-in-difference regression capturing how the passive rate changes when the number of plans changes. Both analyses suggest little relationship between passivity and the choice set size.

We start by noting that the institutional setup argues against two standard explanations for incomplete welfare program take-up (Currie, 2006): lack of awareness and stigma. All of the people we study have applied for public coverage in "step one" of the process, so they cannot be completely unaware of the program, nor are they likely avoiding public coverage due to stigma.

A second mechanism we find evidence against is that plan *choice complexity* is the key barrier, as in models of "choice overload" (Iyengar and Kamenica, 2010). The CommCare choice set is relatively simple, featuring at most four plan options prior to 2010, making choice overload less plausible than in other health insurance markets.[24] Moreover, we see little relationship between the choice set size and the passive enrollment rate. Panel A of Table 1 reports the passive rate in 2008-09 across areas of the state with different number of available plans, with this variation arising from selective insurer entry. There is essentially no relationship between choice set size and the passive rate, which varies from 33-35%. Notably, the passive enrollment rate is 33.9% even in areas with just a *single plan* available. In these areas, the requirement to contact the exchange to "choose" a plan is a pure ordeal.

Panel B of Table 1 shows a panel version of this test, running a simple DD regression to test whether area-level *changes* in the number of available plans lead to changes in the passive rate.[25] Adding an extra plan leads to a small and insignificant change in the passive rate (coeff = -1.4%), again suggesting that passive enrollment is not driven by choice complexity.

[24] For instance, Medicare Advantage features an average of 33 options per enrollee (see https://www.kff.org/medicare/issue-brief/medicare-advantage-2021-spotlight-first-look), and Medicare Part D feature 25-35 plan options (see https://www.kff.org/medicare/fact-sheet/an-overview-of-the-medicare-part-d-prescription-drug-benefit).

[25] The regression specification is:

$$PassiveRate_{a,t} = \alpha_a + \beta_t + \gamma \cdot \Delta NPlans_a * 1\{t \geq 2009\} + \epsilon_{a,t} \quad (2)$$

where a are "service areas" (the level at which insurer entry occurs) and t are months (in the 2008-09 sample period). The coefficient of interest is γ, which is identified off of 6 service areas (out of 38 total) that experience a change in number of plans between 2008-09 – five areas with a 1-plan increase of and one area with 1-plan decrease.

A final mechanism (which is more of a residual) is that the simple requirement to *take action* – even a seemingly simple action – is the barrier.[26] This is consistent with the broader auto-enrollment literature, which finds that even modest opt-in requirements (e.g., calling an HR department to enroll in a 401k) lead to much lower take-up than auto-enrollment. It is also consistent with our conversations with health insurance enrollment assisters in Massachusetts, who noted that many people find health insurance enrollment confusing and can easily get lost.[27] In this view, the auto-enrollment policy works by transforming a two-step enrollment process into one step, using a smart default so that people who get lost in the second step (plan choice) still get coverage.

4 Targeting Implications of Auto-Enrollment

In this section, we study the auto-enrollment policy's targeting implications. Who are the marginal individuals enrolled by the policy, and how do they compare to inframarginal enrollees? Do marginal enrollees benefit from public health insurance, or is it unnecessary for them? These questions matter both for the policy's implications for the insurance risk pool and for its welfare interpretation.

As we discuss further in Section 5, a key theoretical benchmark is the "self-screening" logic of Nichols and Zeckhauser (1982), which shows that ordeals can be desirable if they screen out people with low value for the program relative to cost. In Section 4.1, we study this self-screening idea by comparing the characteristics of marginal (passive) enrollees to inframarginal (active) people, finding that the active enrollment "ordeal" screens out people with both lower value *and* lower public cost. Section 4.2 shows evidence that marginal enrollees do nonetheless obtain meaningful (non-zero) benefits from public insurance, suggesting that an auto-enrollment default is welfare-improving for them (even as it involves higher public spending). These facts set the stage for our analysis of the policy tradeoffs in Sections 5-6.

4.1 Targeting Implications: Who Are the Passive Enrollees?

Our goal is to measure the characteristics of marginal enrollees (or "compliers") due to auto-enrollment and understand how they compare to inframarginal enrollees (or "always takers") who enroll regardless. Our finding in Section 3.1 that auto-enrollment does not crowd out active choice is useful for this analysis. It suggests that *observed* passive enrollees (while the policy is in place) are also marginal individuals who would not enroll without it. Thus, a simple comparison of observed passive vs. active

[26] A paradox of our findings is that passive enrollees *already* completed a six-page form to apply for coverage, which involves much greater paperwork complexity than the plan choice step (which involves logging into a website, calling a phone number, or simply circling a plan choice and mailing back the approval letter). One possible explanation is that many people get help from a social worker or medical staffer with the application, which is often completed at a hospital or clinic after an uninsured person seeks care. By contrast, the plan choice step requires taking *independent action* in response to an approval letter/email received days or weeks later.

[27] We find some evidence that passive enrollees have attributes consistent with facing special barriers. Two barriers suggested in our interviews with assisters were: (1) language barriers, and (2) unstable housing that leads to an approval letter lost in the mail. On the former, we find that the passive enrollment rate is somewhat higher for non-citizen immigrants (41.2%), for whom language barriers may be more common, versus all other enrollees (34.0%). To test the unstable housing story, we examine the rate at which an enrollee's zip code (the most detailed geography we observe) changes in the administrative data during their enrollment spell. We find that zip code changes are uncommon but somewhat more frequent for passive enrollees, with about 0.075 changes per year for passives versus 0.06 for actives.

enrollees in the pre-2010 period gives an accurate comparison of marginal vs. inframarginal enrollees. We use this simple method for our main analysis, shown in Table 2; below we test the robustness of these findings to using the policy change to infer marginal enrollees. In all our analysis, we restrict attention to new enrollees in the main 2008-09 period and control for timing of joining CommCare using month-of-entry fixed effects.[28]

The comparisons in Table 2 suggests three findings about the marginal (passive) enrollees screened out by the active enrollment requirement. First, passive enrollees are younger, healthier, and much lower-cost than active enrollees. Passive enrollees are younger (by an average of 4 years), with an especially large share of people age 19-34 – a group sometimes called "young invincibles." The latter is especially driven by young men age 19-34, who comprise 41% of passive enrollees (vs. 29% of active). They are also healthier, with a third to half lower rates of any/severe chronic illness, and an average risk score (a measure of predicted costs based on age and diagnoses) 37% lower than active enrollees.[29] Consistent with being younger and healthier, passive enrollees have average medical spending 44% lower than active enrollees ($228 vs. $409 per month enrolled).[30] Passive individuals are also more likely not to incur *any* medical spending while enrolled, though most (71%) do use some medical care.

A second finding is that passive enrollees are enrolled for shorter periods, with average durations 4.6 months (or 28%) shorter. Although we do not observe the reason for these shorter spells, our analysis of the time pattern of exits (see Appendix C.2) suggest two main factors: (1) a much higher rate of brief 1-3 month spells (7.5% points, or 48% higher), consistent with a short-term need for coverage (e.g., between jobs), and (2) a much higher exit rate during annual eligibility redetermination (around months 12-14 of the spell). The latter is consistent with failure to complete retermination paperwork, another administrative step to keep coverage.

A final finding (in panel D of Table 2) is that passive enrollees are more economically disadvantaged. Their incomes are slightly lower (20% vs. 25% of the poverty line), though all enrollees in our sample have low incomes. Their differences in neighborhoord characteristics (based on zip code) are larger. Passive enrolles are 8-9% points (about 26%) more likely to live in a zip code with high social disadvantage or to live within two miles of a safety net hospital or community health center.[31] Although

[28]Specifically, let $Y_{i,t}$ be a characteristic/outcome for enrollee i who joins CommCare at time t. We run the regression $Y_{i,t} = \alpha_t + \delta \cdot 1\{Passive_i\} + \varepsilon_{i,t}$, which includes a fixed effect (α_t) for each month of entry. Table 2 reports the mean for active enrollees ($\overline{Y}_{active}$), the time-adjusted mean for passive enrollees ($= \overline{Y}_{active} + \delta$), and the difference between the two (δ and its standard error). We control for timing of entry to account for medical cost trends and other economic shocks that may affect the types of enrollees who join CommCare over time. In practice, this adjustment makes relatively little difference once we restrict attention to enrollees in 2008-09.

[29]We use the HHS-HCC risk score (silver-CSR version) that is used in the ACA Marketplaces. We base the diagnoses and risk score on claims during the first 12 months of the enrollee's spell (or fewer if they are enrolled for less than 12 months). A natural question is whether measured risk differences are driven by the shorter enrollment (and therefore observation) period for passive enrollees. We provide evidence in Appendix C.1 that health differences are robust to the measurement period.

[30]This 44% difference is slightly larger than the 37% predicted difference based on risk score, implying that they are also low-cost on unobservables.

[31]Social disadvantage is defined based on the Social Deprivation Index (SDI) developed by the Robert Graham Center (see https://www.graham-center.org/rgc/maps-data-tools/sdi/social-deprivation-index.html). SDI is an index of area-level deprivation derived from ACS data, based on income, education, housing, employment and other demographics. We define high disadvantage as neighborhoods in the top quartile of the SDI based on the national distribution. Safety net hospitals are defined using a classification by the state of Massachusetts based on having a high share of costs paid by Medicaid or uncompensated care funds.

Table 2: Targeting Implications: Characteristics of Active vs. Passive Enrollees

Outcome	Active Enr. (1)	Passive Enr. (2)	Diff. (3)	(s.e.) (4)
A. Demographics				
Average Age (years)	35.6	31.8	-3.8	(0.1) **
Age 19-34	0.535	0.652	+0.118	(0.003) **
Age 35-54	0.339	0.271	-0.068	(0.003) **
Age 55+	0.126	0.077	-0.049	(0.002) **
Share Male	0.538	0.625	+0.087	(0.003) **
Male Age 19-34	0.286	0.411	+0.125	(0.003) **
B. Health Status and Medical Spending				
Any Chronic Illness	0.641	0.427	-0.215	(0.003) **
Severe Chronic Illness	0.158	0.081	-0.077	(0.002) **
Risk Score (HCC)	1.012	0.644	-0.367	(0.015) **
Average Cost ($/month)	$408.6	$227.9	-$180.6	(5.6) **
Any Spending (>$0)	0.894	0.709	-0.185	(0.003) **
C. Duration Enrolled				
Average (months)	16.5	11.9	-4.6	(0.1) **
Share 1-3 months	0.154	0.228	+0.075	(0.002) **
Share 12+ months	0.559	0.441	-0.119	(0.003) **
Share 16+ months	0.297	0.168	-0.129	(0.003) **
D. Income & Neighborhood				
Income / Poverty Line	0.248	0.200	-0.049	(0.004) **
High-Disadvantage Area	0.320	0.401	+0.082	(0.003) **
Near (<2 mi.) to Safety Net Hospital or Health Center	0.371	0.458	+0.087	(0.003) **

Note: The table shows differences in characteristics/outcomes for passive vs. active enrollees in our sample of new CommCare enrollees during 2008-09. Estimates control for the time of entering the market, as discussed in the text. Income refers to family income as a share of the federal poverty level (FPL). Health and cost measures are based on claims during the enrollee's first (up to) 12 months in the program. Chronic illnesses follow a classification of ICD-9 diagnosis codes shared with us by David Cutler. Risk score is based on the HHS-HCC model (silver-CSR version) used for risk adjustment in the ACA, normalized to be mean 1.0 in the full CommCare data. ** = significant at 1% level.

these differences are smaller than those for health and spending, they suggest that auto-enrollment is well targeted in terms of economic equity.

The proximity of passive enrollees to safety net providers raises the question of whether they could obtain some of their care for free via "charity care" if uninsured. Charity care is an important factor in safety net provider budgets (Craig Garthwaite, Tal Gross and Matthew J Notowidigdo, 2018) and is therefore an important negative externality of uninsurance (Amy Finkelstein, Neale Mahoney and Matthew J Notowidigdo, 2018). While we cannot observe individuals' counterfactual utilization if uninsured, Appendix C.3 documents several indicators that passive enrollees are selected on differential use of standard sources of charity care, including that a larger share of their care comes via emergency rooms, via hospital emergency care, and from safety net hospitals.

Overall, these patterns are consistent with the classic assumption (e.g., in Nichols and Zeckhauser) that ordeals screen out individuals with lower private benefit from a welfare program. Being young,

healthy, and low medical-need are characteristics associated with low demand for health insurance. Similarly, shorter enrollment durations (if anticipated by the individuals) suggest a smaller *total* benefit of enrolling relative to a one-time enrollment hassle. Economic disadvantage is more complicated, but it is also associated with greater price sensitivity and lower insurance take-up under the ACA (Blumberg et al., 2018; Tebaldi, 2020). In a sense, these targeting patterns are natural: when required to complete an additional hassle to obtain insurance, the people who do so tend to be those who value it most. Importantly, however, many of the same characteristics that imply high private benefit from insurance also imply high (public) cost. We explore the implications of this correlation between value and cost in insurance programs in our conceptual analysis in Section 5.

Robustness: Targeting Analysis using the Policy Change An alternate way to study targeting is to use the 2010 policy change to infer the characteristics of marginal enrollees. Prior to 2010, new enrollees include both active and passive individuals; afterward only active choosers enroll. The characteristics of marginal enrollees can be inferred from the compositional change in new enrollees. While less statistically powerful than our main approach, this method does not rely on assuming that passive behavior is exogenous. It also provides direct evidence on how the policy change influences the insurance market risk pool. To implement this, we run DD regressions analogous to equation (1) but with a dependent variable of characteristics/outcomes of new enrollees. We run regressions on individual-level data, clustering standard errors at the group x time period level.

Figure 3 shows the data and DD estimates for two key risk pool variables: average enrollee risk score (panel A) and average cost (panel B). There is a clear increase in both measures for the treatment group (red) relative to controls (green) after auto-enrollment is suspended.[32] The effects are large, with DD estimates suggesting a 0.146 increase in average enrollee risk (implying 14.6% higher costs) and $57.6 increase in average monthly cost (also about a 15% increase). The implication is that the marginal (passive) people screened out by active enrollment are lower-risk and lower-cost, just as we found in Table 2. We can also compare the estimates quantitatively by calculating what Table 2 predicts for the analogous change in average risk and cost assuming passive behavior is exogenous.[33] This prediction is a 0.120 increase in average risk score and $58.9 increase in average cost, which are similar to (and well within the confidence intervals of) the DD estimates.

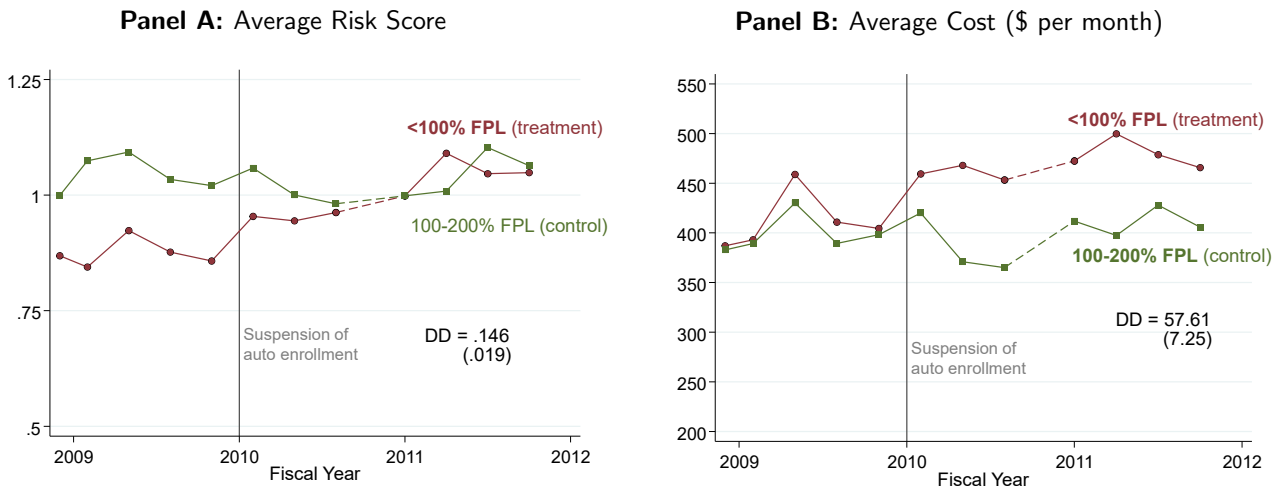
4.2 Do Passive Enrollees Benefit from Public Health Insurance?

The targeting results so far are consistent with passive enrollees having lower value (and cost) of health insurance. In this subsection, we briefly address a different question: do passive enrollees benefit *at all* from being auto-enrolled in public coverage? While it may seem obvious that free insurance is

[32] Counterintuitively, the control group has higher risk scores but similar costs to the treatment group prior to 2010 (and this flips in 2010+). This occurs because CommCare provided more generous benefits to the treatment group, including dental benefits (not available to above-poverty enrollees) and lower cost sharing (zero vs. modest positive copays). The latter also results in higher spending through a moral hazard response (see Amitabh Chandra, Jonathan Gruber and Robin McKnight (2014)).

[33] To do so, note that for any variable Y, $\overline{Y}_{Pre2010} = s_{Passive}\overline{Y}_{Passive} + (1 - s_{Passive})\,\overline{Y}_{Active}$, and $\overline{Y}_{Post2010} = \overline{Y}_{Active}$. Therefore, $\Delta\overline{Y} = \overline{Y}_{Post2010} - \overline{Y}_{Pre2010} = s_{Passive}\left(\overline{Y}_{Active} - \overline{Y}_{Passive}\right)$. We calculate $\Delta\overline{Y}$ using the estimates for $\overline{Y}_{Active}$ and $\overline{Y}_{Passive}$ in Table 2 and $s_{Passive} = 0.326$ from Section 3.1.

Figure 3: Effect of Auto-Enrollment Suspension on Enrollee Risk Pool



Note: The figure shows data on average risk score (Panel A) and average monthly medical cost (Panel B) for new enrollees, and estimates of the difference-in-difference specification (1) using quarterly time periods. The regression uses individual-level data, with standard errors clustered at the quarter-income group level. Each panel shows trends for below-poverty enrollees (the treatment group subject to auto-enrollment pre-2010) versus 100-200% of poverty enrollees (the control group not auto-enrolled). Panel A shows that the average medical risk (expected spending) of new below-poverty enrollees rose by 0.146 , or 14.6% of the CommCare average, following the suspension of auto-enrollment. Panel B shows that average medical costs rose by roughly $58/month for the treatment group.

beneficial, their failure to complete a (seemingly trivial) ordeal to enroll raises this question. Are their benefits from insurance also trivial, or are they meaningful? We address this question in three ways: (1) examining whether enrollees already have duplicate coverage, (2) analyzing their need for insurance based on medical care use, and (3) examining whether enrollees will take action or pay to maintain coverage.

Do Enrollees Have Duplicate Health Insurance?

One simple reason public coverage might not be beneficial is if auto-enrollees already have *other* private health insurance, making public insurance duplicative. CommCare's eligibility criteria (which all passive enrollees have satisfied) are supposed to rule out people with other insurance. But enforcement relies primarily on self-reporting plus periodic audits of private insurance rolls, so it may be imperfect.

To measure duplicate coverage, we use the Massachusetts All-Payer Claims Database (APCD) for 2009-2013. The APCD lets us measure enrollment in the near-universe of Massachusetts health insurance plans.[34] The APCD includes (anonymized) person IDs that let us follow individuals across insurers, including in simultaneous duplicate coverage. Using the APCD's member eligibility file, we construct an enrollment history dataset for people ever enrolled in CommCare that includes their coverage in all other insurance. Appendix D describes the method and shows that the APCD enrollment figures closely match our CommCare data. We then calculate the "duplication rate" – the

[34]This includes private insurance, Medicaid (both public and managed care), CommCare, and Medicare Advantage. The only significant omission from the APCD is Traditional Medicare, but this is unlikely to be relevant for the non-elderly, non-disabled CommCare population. Anyone who qualifies for Medicare should be ineligible for CommCare.

share of CommCare enrollment months during which the member was also enrolled in other private insurance.[35]

Overall, we find a low duplication rate of just 3.1% of CommCare enrollee months. The duplication rate is rises at the end of enrollment spells, but it is less than 6% even in the final month of CommCare coverage. This suggests that duplication, while it does occur, is not a major factor in the CommCare program. We also examine whether passive enrollees are more likely to have duplicate coverage. Although the APCD does not let us observe whether members enrolled passively or actively, we can study how duplication rates change for enrollees who enter CommCare just before vs. after the suspension of auto-enrollment. We find that the duplication rate *rises* slightly after the change, consistent with passive enrollees having lower duplication rates (see Appendix Figure A.13). However, both rates are quite low. Our overall conclusion is that duplicate coverage is rare and is unlikely to explain failure to actively take up coverage.

Do Passive Enrollees Need Health Insurance?

We have emphasized that passive enrollees are on average healthier, but it does not follow that they don't need health insurance. First, passive enrollees are not *uniformly* healthy: over 40% have a chronic illness diagnosis on their claims, and 8% have a severe chronic illness. Second, they do face real risks of expensive medical shocks. Appendix Figure A.10 compares active and passive enrollees' risks of experiencing several proxies for shocks: a high-cost month (defined with various thresholds) and an emergency hospital admission. Passive types are less likely to experience these shocks, but their risks are only 25-42% lower (nowhere near 100%).

Third, most passive enrollees do use medical care while insured. Their average spending of $228 per month, while lower, is still sizable relative to their low incomes (the 2009 poverty line was $903 per month for an individual). While some care could likely be obtained as free charity care even if uninsured, about one-fourth of passive enrollees take a regular prescription medication (with an average cost of $45 per month), a type of care less likely to be available for free.[36] If summed across the average passive enrollment spell (11.9 months), these add up to substantial amounts of covered care that – even if valued at a fraction of its cost (e.g., due to moral hazard and charity care) – is likely to yield meaningful benefits to enrollees.

Will Passive Enrollees Take Action to Stay Insured?

A third way of testing the null of zero benefit from public insurance is to ask whether passive enrollees will take action to stay insured. Initially, these people are auto-enrolled and remain in free coverage by default. The first time people must take action is at eligibility redetermination (about 12-14 months

[35] We do not include duplicate coverage in CommCare plus Medicaid for two reasons. First, the two programs used a unified enrollment system, which should automatically prevent duplicate enrollment. Second, many of the same insurers operate in both programs, and we have some concerns that the insurance type is sometimes mislabeled, which could lead to false positives.

[36] We define regular prescription drugs at the individual-drug level based on several criteria that capture both immediate and prolonged use. We require the first instance of drug use to occur within the first two months of enrollment, and that the drug is supplied for at least 120 days or (to capture instances of short enrollment spells) for at least as many days as the member stays enrolled (no less than 60 days).

after enrollment) when people must complete paperwork to prove continued eligibility. Passive enrollees are indeed more likely to drop out at this time (see Appendix Figure A.8), but Table 2 shows that 16.8% of them stay enrolled for at least 16 months (vs. 29.7% of actives), a proxy for completing redetermination. As a share of people still enrolled at 12 months, about 40% of passive enrollees make it past redetermination by this measure. This is certainly not a high share – and further illustrates the challenge of getting people to take action to get health insurance – but it does indicate that at least a subset of passive enrollees will take action to keep coverage.

5 Conceptual Model

This section presents a simple conceptual model to help interpret the positive and normative impacts of auto-enrollment in subsidized health insurance. Our setup builds on the classic ideas of Nichols and Zeckhauser (1982) and more recent frameworks for take-up and targeting interventions (Finkelstein and Notowidigdo, 2018), the costs and benefits of health insurance (Amy Finkelstein, Neale Mahoney and Matthew J Notowidigdo, 2018), and the marginal value of public funds (Hendren, 2016; Hendren and Sprung-Keyser, 2020).

5.1 Setup and Impact of Auto-Enrollment

Social Value and Cost Consider a population of individuals (i) who (as in our empirical setting) qualify for a subsidized health insurance program and would otherwise be uninsured. If enrolled in insurance, individual i incurs expected monthly costs C_i to the program,[37] while if uninsured they incur (publicly paid) uncompensated care costs of C_i^U per month. To enroll, individuals must pay a (subsidized) premium P per month. In our empirical setting, $P = 0$ but we allow for $P \neq 0$ to consider the role of subsidies. Putting these together, the *net* monthly public cost for insurance (relative to uninsurance) is:

$$C_i^{net} \equiv \underbrace{C_i}_{\text{Direct cost}} - \underbrace{C_i^U}_{\text{Uncomp. care}} - \underbrace{P}_{\text{Premium paid}} \tag{3}$$

Because $P = 0$ in our empirical setting, we expect that $C_i^{net} > 0$ for nearly everyone, and we impose this assumption in the math below.[38]

Enrolling i in insurance also generates expected social value V_i per month (in dollars) relative to uninsurance. This value includes both individual benefits like risk protection and spillover benefits of coverage (e.g., health externalities in a pandemic). After subtracting the premium transfer to taxpayers, the *net* value to recipients plus society is $V_i^{net} \equiv V_i - P$.

If enrolled initially, i stays enrolled for an exogenous period of m_i months, which reflects the period

[37] C_i includes medical costs covered by the insurance program (as well as any administrative costs) but *not* cost sharing paid by the enrollee. In our context, cost sharing is close to zero, so total and insured medical spending are essentially identical.

[38] In principle, C_i^U could exceed C_i, but based on the best available evidence (Amy Finkelstein, Nathaniel Hendren and Erzo FP Luttmer, 2019), formal insurance costs are typically larger due to moral hazard and lower individual costs. If $C_i^{net} \leq 0$, insurance enrollment would involve zero or negative public cost, making it desirable for any $V_i^{net} > 0$. This corresponds to the case of "infinite MVPF" discussed by Hendren and Sprung-Keyser (2020).

of need for public insurance (e.g., between jobs).[39] This scales both value and cost proportionately, but matters for one-time enrollment ordeals. With this setup, we can define the marginal social value per public dollar spent on covering individual i (or the "MVPF" for i) as:

$$MVPF_i \equiv \frac{V_i^{net}}{C_i^{net}} = \frac{V_i - P}{C_i - C_i^U - P} \tag{4}$$

For standard economic efficiency, it is efficient to enroll i if $MVPF_i \geq 1$, or equivalently if $V_i \geq C_i - C_i^U$. More generally, we assume that if budget constrained, the government prefers to target coverage to individuals with higher $MVPF_i$ – or possibly a version that incorporates equity through social welfare weights. How targeting actually occurs, however, depends on take-up behavior, which we consider next.

Take-Up and Auto-Enrollment Individuals enroll in insurance if their willingness-to-pay (WTP) exceeds the cost of premiums and any take-up ordeals. Let W_i be i's expected monthly WTP for insurance. We do not impose rationality but assume this may differ from true individual value because of behavioral biases or "internalities" (ε_i). Further, individuals do not internalize social spillover benefits of coverage (σ_i). We define $E_i \equiv V_i - W_i = \varepsilon_i + \sigma_i$ as the total wedge between social value and private WTP for insurance. We expect that in most cases $E_i > 0$, especially in our economically disadvantaged population, but the framework is general.

When enrollment requires active take-up, individuals also incur a one-time hassle cost of $H_i \geq 0$ to enroll. This could capture either real costs (e.g., the cost of completing paperwork) or behavioral reasons that the ordeal is a barrier (e.g., inattention or misunderstanding program rules).[40] Individuals choose to enroll if their total WTP minus premiums overall the full spell, $U_i^{enr} \equiv m_i (W_i - P)$, exceeds H_i, or equivalently if $W_i - P > H_i/m_i$. The set of active enrollees are:

$$ActiveEnr = \{i : \ W_i - P > H_i/m_i\} \tag{5}$$

Now consider the effect of shifting to auto-enrollment. This changes the *default outcome*, making it a hassle to opt out of coverage. Individuals enroll as long as $U_i^{enr} \geq -\widetilde{H}_i$, where $\widetilde{H}_i \geq 0$ is the (potentially different) hassle cost of opting out. The marginal "passive" enrollees from shifting to auto-enrollment are:

$$PassiveEnr = \left\{i : \ W_i - P \in [-\widetilde{H}_i/m_i, H_i/m_i]\right\} \tag{6}$$

In our empirical setting with $P = 0$, we expect this leads to near-complete take-up because it seems natural that $W_i \geq 0$. This implies an increase in net social value of $\Delta SocValue_{AE} = \sum_{i \in PassiveEnr} m_i V_i^{net}$

[39] Exogenous duration enrolled is consistent with the nature of the auto-enrollment intervention in our setting, which only affects initial take-up. Of course, a richer model could allow m_i to be endogenous to program design (e.g., ordeals and premium). This would involve much greater modeling complexity, including needing to think about the dynamic evolution of value, cost, and willingness-to-pay.

[40] Because H_i can be behavioral (and because of behavioral biases in ε_i), this formulation is general and does not assume rationality, even though it is framed in the terms of optimal choice. In particular, some people may fail to actively enroll despite getting meaningful benefits from insurance in excess of the premium owed.

and an increase of government spending of

$$\Delta GovtSpend_{AE} = \sum_{i \in PassiveEnr} m_i C_i^{net} = \sum_{i \in PassiveEnr} m_i \left(C_i - C_i^U - P \right) \tag{7}$$

This analysis illustrates an important point about auto-enrollment – and by extension, other hassle-reducing interventions. These interventions are often seen as desirable because they expand take-up (producing social value) and do so in a way that seems "free" (or quite cheap) because they involve minimal *direct* implementation costs. But by increasing enrollment in a subsidized program (i.e., if $C_i^{net} > 0$), the interventions create a large "fiscal externality" that in fact makes them quite expensive. Therefore, policies like auto-enrollment are best thought of as a *public investment* in expanding take-up – something that is publicly costly but yields a social return. To understand this return, we next consider the MVPF and targeting properties of auto-enrollment.

5.2 MVPF and Targeting Properties of Auto-Enrollment

Is the shift to auto-enrollment a high-return public investment? And how does this relate to its targeting properties? A natural framework for evaluating the "investment return" of public policies is the marginal value of public funds (MVPF) measure of Hendren (2016). The MVPF is a benefit-cost ratio of a policy from the perspective of the government budget – equal to its monetary value to beneficiaries divided by public cost. For auto-enrollment, the MVPF equals:

$$MVPF_{AE} \equiv \frac{\Delta SocValue_{AE}}{\Delta GovtSpend_{AE}} = \frac{\overbrace{\left(\overline{W}_{Passive} - P\right)}^{\text{Net WTP for passive enr}} + \overbrace{\overline{E}_{Passive}}^{\text{Extra value of ins.}}}{\overline{C}_{Passive} - \overline{C}^U_{Passive} - P} \tag{8}$$

where $\overline{W}_{Passive}$ refers to the (m_i-weighted) average WTP among passive enrollees, and likewise for other variables. Notice that the number of passive auto-enrollees (N_{AE}) cancels out, since it appears in both the numerator and denominator. Instead, the MVPF depends on the *targeting properties*: the nature of the average passive enrollee and their value and costs of coverage. Notice also that $MVPF_{AE}$ is a (cost-weighted) average of $MVPF_i$ for all $i \in Passive$.

Breaking down the MVPF formula in (8), note that the additional public spending (in the denominator) are justified by two forms of value (in the numerator) that reflect inefficiently low take-up under active enrollment. The first is the "extra" value of insurance ($\overline{E}_{Passive}$) due to behavioral biases and social spillovers. The second is net WTP (in excess of P) among passive individuals. The model implies that $W_i - P \in [-\widetilde{H}_i/m_i, H_i/m_i]$ for all $i \in Passive$. Therefore, the size of net WTP depends on whether hassle costs are small or large. If they are small, this term would be close to zero. This follows from a standard envelope theorem logic: a small hassle prevented passive people from enrolling, so they must be close to indifferent about enrolling. If on the other hand hassles are large (or are psychologically magnified), shifting to auto-enrollment may create significant utility for enrollees.

Targeting Properties: Contrast with Standard Ordeals Logic The standard question in the targeting literature is whether an intervention brings in marginal enrollees who are more or less

appropriate (in our setup, higher or lower $MVPF_i$) than existing inframarginal enrollees. As the discussion above suggests, this is not *ex-ante* obvious for auto-enrollment. This ambiguity contrasts with the standard targeting logic, first formalized by Nichols and Zeckhauser (1982), that ordeals tend to screen out relatively inefficient enrollees. It is worth understanding the source of this difference.

Consider a special case of our model in which public costs, the extra value of insurance, duration enrolled, and hassle costs are *constant* across individuals: $C_i^{net} = \overline{C}$,$E_i = \overline{E}$, $m_i = \overline{m}$, and $H_i = \overline{H}$ for all i. Constant public costs and enrollment length is appropriate for many social programs – e.g., consider slots in a subsidized childcare program. Constant extra value and hassle costs could correspond to a case with no behavioral biases and ordeal with identical disutility for everyone. Under these assumptions, all of the variation in targeting efficiency comes from heterogeneity in W_i; formally, $MVPF_i = \frac{W_i - P + \overline{E}}{\overline{C}}$. Moreover, the hassle effectively screens on low WTP, with $W_i - P \leq \overline{H}/\overline{m}$ for passive enrollees and the reverse for active enrollees. Therefore, the ordeal targets efficiently: $MVPF_{AE} \leq \left(\overline{H}/\overline{m} + \overline{E}\right)/\overline{C} < E\left[MVPF_i \,|\, i \in Active\right]$.

These assumptions, while stark, are a useful benchmark for many social programs. But they are unlikely to apply well to health (or other forms of) insurance. Several factors suggest the departure may be substantial:

1. **Correlation between value and cost:** The value of health insurance comes largely from its coverage of expected medical costs and the risk protection it provides. Therefore, expected value (V_i) and WTP (W_i) tend to be highly correlated with costs, C_i.[41] If ordeals screen out low-WTP individuals, these individuals are also likely to have low costs and therefore may not have low $MVPF_i$.

2. **Duration differences:** A related point (which appears relevant in our setting) is that a one-time hassle may screen out individuals with shorter enrollment durations, m_i (see condition (5)). But these short-duration enrollees also tend to have lower *total* public costs, since medical costs scale with duration. Like point #1, this implies a positive correlation between total value and cost that reduces the efficiency of ordeals targeting.

3. **Uncompensated care:** The Samaritan's dilemma suggests that some individuals may have low WTP because of relatively good access to uncompensated care when uninsured (Coate, 1995). To the extent true, low-WTP types screened out by the ordeal will tend to have high C_i^U (relative to C_i) and therefore lower net cost C_i^{net}.

4. **Behavioral biases:** Models with behavioral biases (or "choice frictions") suggest that people who fail to take up insurance at low prices are especially likely to be those with large under-valuations (high ε_i, so high E_i) (Spinnewijn, 2017). Ordeals that screen out low-W_i therefore may select out some individuals with higher $V_i = W_i + E_i$.

In our empirical work, we seek to provide evidence on items #1-3, as well as suggestive evidence of behavioral biases. The common thread among these factors is that they suggest a *positive correlation*

[41] This positive correlation between V_i and C_i would only fail to hold if C_i were heavily driven by low-value moral hazard spending. Behavioral biases could also weaken the correlation, but empirical analyses suggest WTP is highly correlated with costs (Amy Finkelstein, Nathaniel Hendren and Mark Shepard, 2019).

between WTP and net public cost of insurance enrollment. While ordeals screen out low-WTP types, these individuals may also have low costs, and therefore, their $MVPF_i$ may *not* be low. This positive correlation point is similar to the standard logic for why adverse selection leads to inefficiently low trade: a fixed price screens out low-WTP types, who may not have low gains from trade, $V_i - C_i$. Just as adverse selection motivates price subsidies in the standard analysis, adverse selection on hassle costs motivates "subsidizing" hassles by reducing ordeals relative to the Nichols and Zeckhauser (1982) benchmark.

6 Policy Analysis: Auto-Enrollment and Subsidies

Auto-enrollment is not the only policy tool to increase health insurance take-up. In this section, we compare auto-enrollment to its main policy alternative: larger premium subsidies. Subsidies and default enrollment work by reducing the two types of enrollment barriers highlighted in our model: financial costs and hassle costs. How do these policies compare and interact in terms of their cost effectiveness for increasing take-up?

We frame our analysis around a hypothetical policymaker with a limited budget choosing whether and how to adjust policies to boost take-up. We compare two approaches: (1) larger subsidies to reduce premiums for partially subsidized enrollees, and (2) auto-enrollment for people already eligible for free insurance. These approaches reflect two hypothetical options for increasing take-up in ACA markets today. In addition, they reflect (in reverse) two real options faced by the Massachusetts exchange in 2010 when it needed to cut spending to close a budget shortfall. At that time, the exchange chose to eliminate auto-enrollment rather than further reduce subsidies, which it had just done the prior year. Did the exchange make the right choice? Our analysis can help evaluate the tradeoffs and guide future thinking.

We start in Section 6.1 by theoretically analyzing these policies, building on the previous section's framework. Section 6.2 then empirically estimates the key theoretical quantities using evidence from our analysis of auto-enrollment and evidence from Amy Finkelstein, Nathaniel Hendren and Mark Shepard (2019) on the impact of subsidy changes in the same CommCare market.

6.1 Theory

Consider a policymaker choosing between using subsidies vs. auto-enrollment to increase take-up. How do these compare in terms of their cost effectiveness and MVPF? Start with a small subsidy increase that lowers beneficiary premiums from $\$P^{enr}$ to $\$\left(P^{enr}-1\right)$, while retaining the hassles (η_i) associated with active enrollment. Using the framework of Section 5, this leads to new take-up by individuals for whom $W_i - \eta_i \in [P^{enr}-1, P^{enr}]$. Denote the size of this group by $\frac{-dN}{dP}$ (the slope of the demand curve), and let N_0 be baseline enrollment before the change. The government cost of this subsidy increase equals

$$\Delta GovtSpend_{Subs} = \frac{-dN}{dP} \cdot \left(\overline{C}_S^{Ins} - P^{enr} - \overline{C}_S^{U}\right) + N_0, \tag{9}$$

where first term is the subsidy spending on marginal enrollees and the second term reflects the $1 subsidy increase for each of the N_0 inframarginal enrollees.

Comparing this equation to the cost of auto-enrollment (equation (7)) yields two insights. First, only subsidies involve additional spending on inframarginal enrollees, an additional direct cost that will tend to make subsidies more expensive. Second, both policies require additional spending on marginal enrollees, with the amount of this spending depending on their targeting properties. The policies' marginal populations may differ – for auto-enrollment, it is individuals with $W_i - P^{enr} \in [0, \eta_i]$, while for subsidies it is those with $W_i - P^{enr} \in [\eta_i - 1, \eta_i]$ – though if hassle costs η_i are small, their targeting properties will be similar.

The MVPF of a $1 increase in subsidy equals:

$$MVPF_S = \frac{\overbrace{\frac{-dN}{dP} \cdot \overline{E}_S}^{\text{Social value of newly ins.}} + \overbrace{N_0}^{\text{Transfer to inframarginal}}}{\underbrace{\frac{-dN}{dP} \cdot \left(\overline{C}_S^{Ins} - P^{enr} - \overline{C}_S^{U}\right)}_{\text{Spending on newly insured}} + \underbrace{N_0}_{\text{Transfer}}} \tag{10}$$

where variables $\overline{X}_S$ indicate averages of X_i for marginal enrollees due to the subsidy. The denominator is simply the government's cost for increasing subsidies, given by 9.

The subsidy's MVPF is in some ways similar to that for auto-enrollment in (8), but there are three relevant differences. First, the envelope theorem applies exactly, so there is no enrollee WTP in the numerator as in (8). Recall, however, that we expect this term to be small, so this difference is less meaningful. Second, the *targeting properties* of the interventions may differ – value and costs of insurance may differ for the marginal "S" versus "AE" groups. Both policies target individuals who are close to indifferent about enrolling, but auto-enrollment additionally targets individuals with high hassle costs.[42] How these groups differ in terms of value/costs is an empirical question.

Third, and most significantly, the subsidy involves a *transfer to inframarginal enrollees* via lower premiums. This transfer appears as the N_0 term in both the numerator (value to beneficiaries) and denominator (cost to government) – the cost of $1 given to N_0 individuals. The newly insured value/cost terms are scaled by the size of this group ($\frac{-dN}{dP}$), which may be much smaller.

A way of thinking about this difference is as follows. Auto-enrollment works like a *targeted subsidy*: it increases take-up among marginal enrollees without any spending on inframarginal people. By contrast, increasing a broad (non-targeted) subsidy combines a targeted subsidy *plus* a transfer to existing enrollees. This transfer makes the subsidy more expensive per person gaining coverage. The transfer per newly insured is $\$N_0 / \left(\frac{-dN}{dP}\right)$ per person gaining coverage, which may be quite large. Thus, for the government to achieve a given expansion in coverage, a broad subsidy will tend to be more expensive than auto-enrollment because it involves spending on inframarginal enrollees. However, this does not mean that auto-enrollment is necessarily more socially desirable. The broad subsidy may be

[42] To see this, note that the "AE" group are those with $W_i - P^{enr} \in [0, \eta_i]$, while the "$S$" group for a subsidy of size dP are those with $W_i - P^{enr} \in [\eta_i - dP, \eta_i]$. These sets are overlapping for η_i near 0, but (for a subsidy amount that covers the same number of people) auto-enrollment will tend to reach more people with high hassle costs.

more socially desirable if a cash transfer has a higher MVPF than the targeted subsidy alone – i.e., if $\overline{E}_S / \left(\overline{C}_S^{Ins} - P^{enr} - \overline{C}_S^U\right) < 1$= MVPF of a cash transfer. In this case, the transfer to inframarginals – the N_0 term to the numerator and denominator in 10 – raises the overall MVPF towards 1.0.

We can summarize this discussion in the following three results:

- **Result #1:** Auto-enrollment and subsidies may have different *targeting properties* in terms of the marginal groups who take up insurance. Both target people close to indifferent about enrolling, but auto-enrollment additionally enrolls people with high hassle costs.

- **Result #2:** Conditional on the same targeting properties for costs ($\overline{C}_{AE}^{Ins} = \overline{C}_S^{Ins}$, $\overline{C}_{AE}^U = \overline{C}_S^U$), auto-enrollment is a more *cost effective* way of expanding coverage than a subsidy – in the sense that it has lower government spending per additional insured person. This occurs because a subsidy involves a large transfer to inframarginal enrollees that is not required for auto-enrollment.

- **Result #3:** Conditional on the same targeting properties for costs (as in #2) and value ($\overline{E}_{AE} = \overline{E}_S$, $\overline{W}_{AE} = P^{enr}$), if expanding coverage is more desirable than a cash transfer (i.e., $MVPF_{AE} > 1$), then $MVPF_{AE} > MVPF_S$. Auto-enrollment is more desirable in terms of its MVPF.

6.2 Results: Cost Effectiveness

To empirically estimate the cost effectiveness of auto-enrollment and subsidy expansions, we draw on two sources of evidence. For auto-enrollment, we use our causal evidence presented in Sections 3-4 above. For subsidies, we draw on the analysis of Amy Finkelstein, Nathaniel Hendren and Mark Shepard (2019) (hereafter "FHS"), who study RD subsidy variation in the same Massachusetts market. Their analysis identifies the effect of using subsidies to reduce enrollee premiums for the cheapest available plan by $38-39 per month for enrollees at 150%, 200%, and 250% of FPL. Consistent with the policy comparison we have in mind, the auto-enrollment evidence applies to fully subsidized ($0 premium) enrollees with incomes below 100% of FPL, while the FHS subsidy evidence applies to higher-income partially subsidized individuals.

In the current draft, we analyze only the *cost effectiveness* of the two policies – their fiscal cost per newly insured individual. This corresponds to the to the denominator of the MVPF expressions in equations (8) and (10). We briefly discuss the likely differences in the numerators (social value per newly insured) and plan to study this further in a future revision.

Table 3 shows the results of this analysis, with column (1) showing results for auto-enrollment and columns (2)-(4) showing results for subsidies that lower premiums by $38-39 (from different starting levels). Panel A shows estimates of spending on (newly insured) marginal enrollees.[43] Medical costs are roughly comparable for marginal the auto-enrollees ($228 per month) versus the marginal enrollees

[43] To calculate these from FHS, we draw on the share insured (s) and average costs (AC) below and above each RD income cutoffs reported in their Appendix Table 6. We then calculate the cost of marginal enrollees using the standard formula $MC = \Delta TotalCost / \Delta Share = (AC_0 \cdot s_0 - AC_1 \cdot s_1) / (s_0 - s_1)$, where the 0 and 1 subscripts refer to values below and above the RD cutoff. The size of the inframarginal population is s_1 (i.e., take-up at the higher premium); the size of the marginal population is $(s_0 - s_1)$; and the ratio of inframarginals to marginals (used in the calculation below) is $s_1 / (s_0 - s_1)$.

Table 3: Cost Effectiveness: Auto-Enrollment vs. Subsidies

Public Cost Calculation ($/month)	Auto Enrollment	Subsidy Increase (↓premiums)		
		$39 to $0	$77 to $39	$116 to $77
	0-100% FPL	*150% FPL*	*200% FPL*	*250% FPL*
	(1)	(2)	(3)	(4)
Panel A: Spending on Marginal Enrollees				
Medical Costs	$228	$196	$268	$281
Premiums Paid	$0	$0	$39	$77
Net Public Subsidy	*$228*	*$196*	*$229*	*$204*
Panel B: Discounts for Inframarginal Enrollees				
Discount ($/month)	---	$39	$38	$39
Inframarginals per marginal enr.	3.12	2.92	2.80	3.14
Spending on inframarginals (per marginal enrollee)	*$0*	*$114*	*$106*	*$123*
Panel C: Total Cost per Newly Insured				
Gross Cost	**$228**	**$310**	**$336**	**$326**
%Δ vs. auto-enr.	*--*	*+36%*	*+47%*	*+43%*
Net Cost (w/ charity care savings)	**$82**	**$184**	**$164**	**$147**
%Δ vs. auto-enr.	*--*	*+125%*	*+100%*	*+79%*

NOTE: The table breaks down the cost effectiveness – or public spending per newly insured enrollee per month – of auto-enrollment (column 1) versus subsidy increases (columns 2-4). Estimates for auto-enrollment are drawn from this paper, while estimates for subsidies are drawn from Amy Finkelstein, Nathaniel Hendren and Mark Shepard (2019). Panel A calculates public spending on marginal enrollees only; panel B shows spending on discounts for inframarginal enrollees (converted to an amount per marginal enrollee on the final line); and panel C sums these to calculate the total public cost per newly insured. The final entry on "net costs" refers to the net cost of providing insurance, after subtracting an estimate of the cost of charity care on the uninsured. See the text for further discussion of the variables and assumptions.

due to larger subsidies at 150% of poverty ($196 per month). Consistent with adverse selection, medical costs rise for marginal groups at a higher premium (i.e., the marginal cost curve slopes down) – up to $268 when premiums fall from $77 to $39 (column 3) and $281 when premiums fall from $116 to $77 (column 4). But interestingly, after subtracting the premiums paid, the *net public subsidy* on marginal enrollees is quite similar across all four policy changes (at about $200-230 per month). Thus, in terms of spending on marginal enrollees only, auto-enrollment and the three subsidy changes are similarly cost-effective.

Panel B, however, shows that auto-enrollment and subsidies spend very different amounts on *inframarginal enrollees*. Auto-enrollment involves *zero* new public spending on inframarginal enrollees, since there is no direct cost of changing the administrative default. By contrast, larger subsidies involves substantial public spending on discounts for inframarginal enrollees. The discount per inframarginal equals the subsidy increase ($38-39 per month). To convert this to an amount per marginal enrollee, we multiply times the ratio of inframarginal to marginal enrollees based on the FHS estimates (which is about 3). The spending on inframarginal discounts ranges from $106-123 for each marginal enrollee covered.

Panel C sums up amounts from panels A and B to calculate total public spending per newly insured (marginal) enrollee. A lower spending per newly insured indicates that the policy is more cost effective at increasing insurance coverage. In terms of gross public cost (the simple sum of the totals in panel A and B), auto-enrollment costs $228 per newly insured per month versus $310-336 for larger subsidies – a difference of $82-108, or 36-47%. All of this difference is accounted for by the significant subsidy spending on discounts inframarginal enrollees (panel B). This is the key reason for the cost effectiveness advantage of auto-enrollment – an advantage likely to be shared by other ordeals-reducing policies.

FHS emphasize that gross costs may overstate the *net social cost* of insurance because they fail to net out savings on charity care on the uninsured. Although we do not have direct estimates of charity care spending, we can follow their method for estimating charity care spending based on observed insured costs and estimates of moral hazard and out-of-pocket payments by the uninsured.[44] When we do this, the net cost is much lower: $82 for auto-enrollment versus $147-184 for subsidies. However, auto-enrollment continues to be much more cost-effective than subsidies, by a factor of $65-102, or 79-125%.

The results indicate that the public cost per newly insured is lower for auto-enrollment. However, this is only the denominator of the MVPF calculation discussed in the theory. The numerator of MVPF – the value of providing insurance – is more challenging to estimate, though we plan to provide additional insights via a model in future revisions of this paper. What we can say now is the following. Auto-enrollment provides value to the extent marginal (passive) enrollees and society benefit from giving them health insurance. Subsidy increases provide a similar value to its marginal enrollees but also provide a direct cash transfer to inframarginal enrollees (with an MVPF of 1.0). Whether the overall MVPF of auto-enrollment is higher or lower depends on whether giving marginal people health insurance has a social MVPF of greater than or less than 1.0. If insurance is more socially valuable than cash transfers, auto-enrollment likely has higher MVPF; if the reverse is true, subsidies likely have a higher MVPF. [45]

7 Conclusion

This paper studies the impacts and public economic tradeoffs of reducing enrollment ordeals for public health insurance through an automatic enrollment policy. Although auto-enrollment has been studied

[44] Specifically, they note that total medical spending by the uninsured equals $C_U^{Tot} = C_{Ins}^{Tot}/(1+MH)$, where C_{Ins}^{Tot} is medical spending when insured (medical costs in Panel A of Table 3) and MH is the percent moral hazard. Charity care costs covered by medical providers (and/or the state if these providers are reimbursed) equal $C_U = (1-\phi)\, C_U^{Tot}$, where ϕ is the out-of-pocket share of costs covered by the uninsured. This implies $C_U = \left(\frac{1-\phi}{1+MH}\right) \cdot C_{Ins}^{Tot}$. Net social costs per newly insured equal gross costs minus C_U. FHS assume $MH = 0.25$ and $\phi = 0.20$ based on estimates from the Oregon experiment (Amy Finkelstein, Nathaniel Hendren and Erzo FP Luttmer, 2019), which implies that $C_U = 0.64 \cdot C_{Ins}^{Tot}$.

[45] Unfortunately, it is is difficult estimate which is true in the current case because *revealed preference* suggests that marginal enrollees have quite low value of insurance – they were not willing to incur a tiny ordeal to get free coverage. Therefore, any value must come from behavioral biases and social spillovers from insurance (aside from charity care savings) – the $\overline{W}_{AE}$ and $\overline{E}_{AE}$ in equation (8). On the one hand, if these terms are small, then auto-enrollment is unlikely to be a good idea. But if these terms are small, why does society choose to provide generous health insurance transfer to the poor and stingy cash benefits? There is a sense of revealed public policy preference that providing insurance must be more desirable than cash, but this is difficult to assess directly from the data.

extensively in settings like pensions and savings programs, our paper provides the first direct causal evidence on its impact for health insurance. We highlight the conceptual connection between auto-enrollment and the general class of policies that reduce non-price enrollment ordeals for subsidized public programs. Understanding the effect of these ordeals on public program targeting efficiency, a question initiated by Nichols and Zeckhauser (1982), is an area of significant interest in economics but has not been studied for the case of health insurance. More generally, we address the question of whether reducing ordeals through auto-enrollment is a cost-effective investment in greater coverage, or whether alternate policies like subsidies may do better.

Our paper has two main sets of findings. First, descriptively, we find a substantial enrollment effect of shifting from active to auto-enrollment, with the flow of new enrollment increasing by 48% and steady state enrollment by 32%. We find auto-enrollment does not appear to crowd out enrollment by active plan choice; instead, essentially all of the passive enrollees are marginal to the policy and would not have enrolled if required to actively choose a plan. We find no evidence that the complexity of choosing a plan is the key barrier; instead, the simple requirement to take an additional step of action – even a seemingly simple action – seems to be the issue.

Our evidence suggests that even modest non-price barriers can be a major deterrent to health insurance take-up, consistent with recent work finding a similar result for modest financial premiums (Laura Dague, 2014; Amy Finkelstein, Nathaniel Hendren and Mark Shepard, 2019). This contributes to an emerging paradox in the health insurance literature. Even though growing evidence finds major health and economic benefits of providing public health insurance, getting low-income individuals to pay much for it or or actively take it up is a challenge.

Second, we provide new evidence on the economic tradeoffs associated with removing health insurance enrollment ordeals via auto-enrollment. We find that auto-enrollment is likely to be a relatively high-return investment in increasing coverage for two reasons. First, its targeting properties appear to be relatively favorable. While the marginal enrollees due to auto-enrollment – those who would be screened out by the ordeal of active choice – tend to have attributes consistent with lower value of insurance (younger, healthier, shorter-duration), these same attributes also imply lower public cost of coverage and may correlate with higher charity care costs (an externality of uninsurance).

This evidence enriches the standard understanding of the Nichols and Zeckhauser (1982) logic for when ordeals are and are not desirable. Recent work has emphasized the cases where ordeals fail to screen out low-value types, often because psychological hassle costs or behavioral biases are larger for needier people (Bertrand, Mullainathan and Shafir, 2004; Bhargava and Manoli, 2015; Finkelstein and Notowidigdo, 2018; Deshpande and Li, 2019). Our paper points out an additional issue relevant for *insurance programs*, where cost varies widely across potential enrollees. Even when ordeals succeed in screening out low-value types, if low value is correlated with low cost or high external costs of failure to enroll (charity care), the ordeal's targeting properties are unlikely to be desirable.

A second finding is that auto-enrollment – like other ordeals-reducing policies – are a cost-effective investment in increasing coverage relative to higher subsidies. Both policies target a similar, relatively low-value, low-cost marginal group. But the key difference is that ordeals reduction limits all new spending at marginal enrollees, while subsidies require paying significant discounts to inframarginal

people. In essence, auto-enrollment works like a highly-targeted subsidy just for marginal enrollees, while subsidies combine this targeted subsidy with a cash transfer to inframarginals. Therefore, if the policymaker's primary goal is to increase coverage at minimal public cost, making the enrollment process easy by reducing ordeals is a relatively cost-effective way of doing so.

We conclude by noting that our findings have relevance for real-world policies in the ACA, Medicaid, and other insurance programs. Medicaid uses a form of Massachusetts' auto-enrollment policy (calling it "auto-assignment") as a standard in all state programs, and statistics suggests that about 45% of people are enrolled this way (Kaiser Family Foundation, 2015). Our evidence suggests that without this policy, Medicaid take-up would be much lower. On the one hand, states could use active enrollment as an ordeal to substantially reduce Medicaid enrollment, but our analysis suggests this would unlikely to be desirable. By contrast, the ACA Marketplaces do not use auto-enrollment, and take-up among people who have already qualified for coverage but have failed to choose a plan is an ongoing issue (Domurat, Menashe and Yin, 2021). Although there are administrative challenges, the ACA could use a form of the auto-enrollment policy from Massachusetts for the increasing share of enrollees who qualify for at least one $0 plan. Or the ACA could go further by implementing auto-enrollment at a population level – e.g., auto-enrollment via tax returns, as in a recent policy experiment in Maryland. Our results shed light on the likely high impact and favorable tradeoffs of these policies, suggesting the advantages of exploring auto-enrollment changes if administrative and policy hurdles can be surmounted.

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Online Appendix: "Reducing Ordeals through Automatic Enrollment"

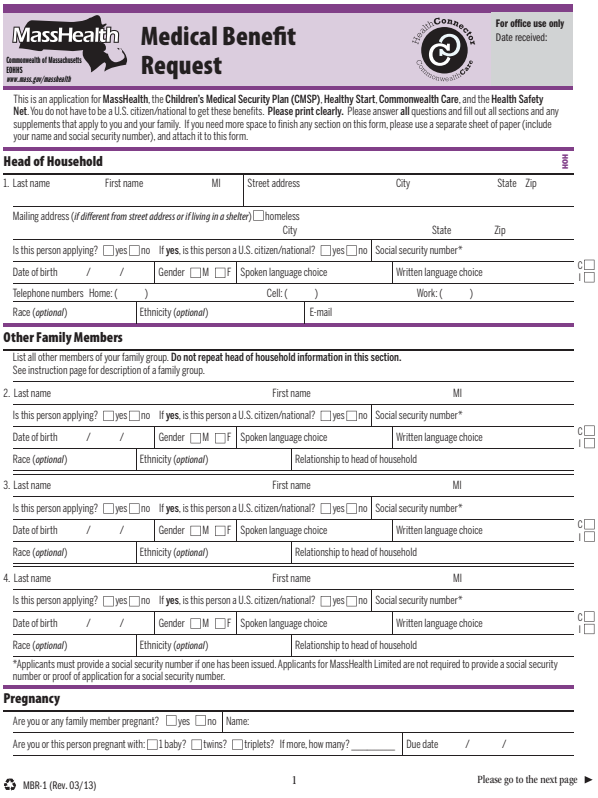
Mark Shepard and Myles Wagner

A Appendix: Additional Background and Summary Statistics

A.1 CommCare Enrollment Process and Forms

Application Form for CommCare

The following shows the application form that must be submitted to apply for CommCare. This form collects information on income, family status, and other sources of health insurance. The state uses this form to determine whether a person was eligible for CommCare, Medicaid (MassHealth) or neither. In addition to the main six pages below, there is a signature page and five pages of "supplements" that certain groups of applicants need to fill out.



MassHealth
Commonwealth of Massachusetts
EOHHS
www.mass.gov/masshealth

Medical Benefit Request

Health Connector CommonwealthCare

For office use only
Date received:

This is an application for **MassHealth**, the **Children's Medical Security Plan (CMSP)**, **Healthy Start**, **Commonwealth Care**, and the **Health Safety Net**. You do not have to be a U.S. citizen/national to get these benefits. **Please print clearly.** Please answer **all** questions and fill out all sections and any supplements that apply to you and your family. If you need more space to finish any section on this form, please use a separate sheet of paper (include your name and social security number), and attach it to this form.

Head of Household HOH

1. Last name | First name | MI | Street address | City | State | Zip

Mailing address (*if different from street address or if living in a shelter*) ☐ homeless
City | State | Zip

Is this person applying? ☐ yes ☐ no If **yes**, is this person a U.S. citizen/national? ☐ yes ☐ no | Social security number*

Date of birth / / | Gender ☐ M ☐ F | Spoken language choice | Written language choice | C ☐ I ☐

Telephone numbers Home: ( ) Cell: ( ) Work: ( )

Race (*optional*) | Ethnicity (*optional*) | E-mail

Other Family Members

List all other members of your family group. **Do not repeat head of household information in this section.**
See instruction page for description of a family group.

2. Last name | First name | MI

Is this person applying? ☐ yes ☐ no If **yes**, is this person a U.S. citizen/national? ☐ yes ☐ no | Social security number*

Date of birth / / | Gender ☐ M ☐ F | Spoken language choice | Written language choice | C ☐ I ☐

Race (*optional*) | Ethnicity (*optional*) | Relationship to head of household

3. Last name | First name | MI

Is this person applying? ☐ yes ☐ no If **yes**, is this person a U.S. citizen/national? ☐ yes ☐ no | Social security number*

Date of birth / / | Gender ☐ M ☐ F | Spoken language choice | Written language choice | C ☐ I ☐

Race (*optional*) | Ethnicity (*optional*) | Relationship to head of household

4. Last name | First name | MI

Is this person applying? ☐ yes ☐ no If **yes**, is this person a U.S. citizen/national? ☐ yes ☐ no | Social security number*

Date of birth / / | Gender ☐ M ☐ F | Spoken language choice | Written language choice | C ☐ I ☐

Race (*optional*) | Ethnicity (*optional*) | Relationship to head of household

*Applicants must provide a social security number if one has been issued. Applicants for MassHealth Limited are not required to provide a social security number or proof of application for a social security number.

Pregnancy

Are you or any family member pregnant? ☐ yes ☐ no | Name:

Are you or this person pregnant with: ☐ 1 baby? ☐ twins? ☐ triplets? If more, how many? _____ | Due date / /

♻ MBR-1 (Rev. 03/13) 1 Please go to the next page ►

Residency (You must fill out this section.) MAN

Are you and all members of your household who are applying for benefits living in Massachusetts with the intention to stay? ☐ yes ☐ no

If **no**, list the names of the members of your household (including yourself)* who are applying and who are **not** residents of Massachusetts and who intend to leave.

*Do not include infants born in Massachusetts who have not left the state.

General instructions for filling out the Working Income, Nonworking Income, AND College Student sections
Each family member who has income and/or is aged 19 or older must fill out all sections on this page through page 4.

Working Income (You must fill out this section.) EIN

1. Name

Is this person currently working or seasonally employed? **(You must answer this question.)** ☐ yes ☐ no

If **yes**, fill out the **Employer Information** section below.
If **no**, answer the next two questions below. You do not have to fill out the "Employer Information" section below.

Has this person worked in the last 12 months before the date of application? ☐ yes ☐ no

If **yes**, how much did this person earn in the last 12 months before taxes and deductions? **Note:** If you answered **"yes"** to this question, you **MUST** enter a dollar amount on this line. $ _____ If **no**, go to the next section *(Nonworking Income)*.

Employer Information Employer name

Employer address, and telephone number

Type of work (*Check all that apply.*) ☐ full-time ☐ day labor ☐ part-time ☐ seasonal yearly wage: $ _____
☐ self-employed ☐ sheltered workshop yearly wage: $ _____

Number of hours per week | Weekly pay before deductions $ | Date began getting this amount of pay / /

Is health insurance offered that would cover doctors' visits and hospitalizations? ☐ yes ☐ no
(Answer **yes** even if you cannot get it now, chose not to sign up for it, or dropped insurance that was available.)

If you answered **no** to the above question, was health insurance offered in the last six months? ☐ yes ☐ no

Send proof of income, like a copy of one recent pay stub. If self-employed, see the MassHealth Member Booklet for information about the needed proof.

2. Name

Is this person currently working or seasonally employed? **(You must answer this question.)** ☐ yes ☐ no

If **yes**, fill out the **Employer Information** section below.
If **no**, answer the next two questions below. You do not have to fill out the "Employer Information" section below.

Has this person worked in the last 12 months before the date of application? ☐ yes ☐ no

If **yes**, how much did this person earn in the last 12 months before taxes and deductions? **Note:** If you answered **"yes"** to this question, you **MUST** enter a dollar amount on this line. $ _____ If **no**, go to the next section *(Nonworking Income)*.

Employer Information Employer name

Employer address, and telephone number

Type of work (*Check all that apply.*) ☐ full-time ☐ day labor ☐ part-time ☐ seasonal yearly wage: $ _____
☐ self-employed ☐ sheltered workshop yearly wage: $ _____

Number of hours per week | Weekly pay before deductions $ | Date began getting this amount of pay / /

Is health insurance offered that would cover doctors' visits and hospitalizations? ☐ yes ☐ no
(Answer **yes** even if you cannot get it now, chose not to sign up for it, or dropped insurance that was available.)

If you answered **no** to the above question, was health insurance offered in the last six months? ☐ yes ☐ no

Send proof of income, like a copy of one recent pay stub. If self-employed, see the MassHealth Member Booklet for information about the needed proof.

2 Please go to the next page ►

Nonworking Income (You must fill out this section.)

Rental Income Do you or any family member get rental income? **(You must answer this question.)** ☐yes ☐no RENT

If **yes**, enter the monthly amount of rental income (before taxes and deductions) on this line. $ _____

Name of person getting rental income

If **no**, go to the next section (*Unemployment Benefits*).

Send proof of rental income.

Unemployment Benefits Are you or any family member getting an unemployment check? **(You must answer this question.)** ☐yes ☐no UNEM

If **yes**, fill out this section and answer all questions. **Send proof** of unemployment benefits.
If **no**, go to the next section (*Other Nonworking Income*).

Name of person getting unemployment benefits

Is this check from the Commonwealth of Massachusetts? ☐yes ☐no

If **yes**, in the 12 months before this person became unemployed, did this person work for an employer in Massachusetts? ☐yes ☐no
(Do not include federal employers, like the U.S. Postal Service.)

Enter the monthly amount of unemployment benefits (before taxes and deductions). $ _____

Name of person getting unemployment benefits

Is this check from the Commonwealth of Massachusetts? ☐yes ☐no

If **yes**, in the 12 months before this person became unemployed, did this person work for an employer in Massachusetts? ☐yes ☐no
(Do not include federal employers, like the U.S. Postal Service.)

Enter the monthly amount of unemployment benefits (before taxes and deductions). $ _____

Other Nonworking Income Do you or any family member have any other income? **(You must answer this question.)** ☐yes ☐no OTH

If **yes**, fill out this section.
If **no**, go to the next section (*College Student*).

Please describe the source of the income (where it comes from) for each family member. If anyone has more than one source, list on separate lines.

Send proof. Some types of other income are: (You do not have to send proof of social security or SSI income.)
- alimony
- annuities
- child support
- dividends or interest
- pensions
- retirement
- social security
- SSI
- trusts
- veterans' benefits (federal, state, or city)
- workers' compensation
- other (*Please describe below.*)

Name	Type of income (all that apply from list above)
Source (where the income comes from)	Monthly amount before taxes $
Name	Type of income (all that apply from list above)
Source (where the income comes from)	Monthly amount before taxes $
Name	Type of income (all that apply from list above)
Source (where the income comes from)	Monthly amount before taxes $

College Student (You must fill out this section.)

Are you or any family member a college student? **(You must answer this question.)** ☐yes ☐no

If **yes**, fill out this section and answer all questions.
If **no**, go to the next section (*Health Insurance You Have Now and Subsidized Health Insurance You May Be Eligible For*).

1. Name of college student

Is this person eligible for health insurance from college? ☐yes ☐no

Is this person a college student in Massachusetts with at least 75% of a full-time schedule? ☐yes ☐no
(**Note:** If you are not sure that this person has 75% of a full-time schedule, contact the school to find out if the number of credits the student is taking would require the student to get the health insurance the school offers to students.)

If yes, is this student planning to get health-insurance coverage from the school, but is waiting for coverage to start? ☐yes ☐no

If yes, what is the date that the school health-insurance coverage starts? ___ / ___ / ___

2. Name of college student

Is this person eligible for health insurance from college? ☐yes ☐no

Is this person a college student in Massachusetts with at least 75% of a full-time schedule? ☐yes ☐no
(**Note:** If you are not sure that this person has 75% of a full-time schedule, contact the school to find out if the number of credits the student is taking would require the student to get the health insurance the school offers to students.)

If yes, is this student planning to get health-insurance coverage from the school, but is waiting for coverage to start? ☐yes ☐no

If yes, what is the date that the school health-insurance coverage starts? ___ / ___ / ___

Health Insurance You Have Now and Subsidized Health Insurance You May Be Eligible For

Even if you or any family member have other health insurance, MassHealth may be able to help you pay your premiums. Health insurance can be from an employer, an absent parent, a union, a school, Medicare, or Medicare supplemental insurance, like Medex. **All applicants must fill out the health insurance section. Do not include MassHealth or any health plan you enrolled in through Commonwealth Care when answering the questions below.**

Do you or any family member get Medicare benefits? ☐yes ☐no

If **yes**, name(s):

Claim number(s):

Do you or any family member have health insurance other than Medicare? ☐yes ☐no

If **yes**, fill out both **Part A** below and **Part B** on the next page.
If **no**, fill out **Part B** on the next page.

Part A: Health Insurance You Have Now

1. Policyholder name | Date of birth / /

Social security number* | Insurance company name

Policy type (*Check one.*) ☐individual ☐couple (two adults) ☐dual (one adult, one child) ☐family | Policy start date ___ / ___ / ___

Policy number | Group number (if known)

Employer or union name

Policyholder contribution to premium costs (*Complete one.*) $ per week | $ per quarter | $ per month

Insurance type (*Check one.*) ☐employer or union subsidized (employer or union pays some or all of the insurance cost) ☐TRICARE
☐other federal or state subsidized (government pays some or all of the insurance cost) ☐student health insurance through school
☐nonsubsidized, like self-employment or COBRA (policyholder pays total insurance cost) ☐Medical Security Program

Names of covered family members

Insurance coverage (*Check all that apply.*) ☐doctors' visits and hospitalizations ☐catastrophic only ☐vision only ☐pharmacy only ☐dental only

If you have long-term-care insurance, **send a copy** of the policy.

* Required, if obtainable and one has been issued, whether or not this person is applying.

2. Policyholder name | Date of birth / /

Social security number* | Insurance company name

Policy type (*Check one.*) ☐individual ☐couple (two adults) ☐dual (one adult, one child) ☐family | Policy start date ___ / ___ / ___

Policy number | Group number (if known)

Employer or union name

Policyholder contribution to premium costs (*Complete one.*) $ per week | $ per quarter | $ per month

Insurance type (*Check one.*) ☐employer or union subsidized (employer or union pays some or all of the insurance cost) ☐TRICARE
☐other federal or state subsidized (government pays some or all of the insurance cost) ☐student health insurance through school
☐nonsubsidized, like self-employment or COBRA (policyholder pays total insurance cost) ☐Medical Security Program

Names of covered family members

Insurance coverage (*Check all that apply.*) ☐doctors' visits and hospitalizations ☐catastrophic only ☐vision only ☐pharmacy only ☐dental only

If you have long-term-care insurance, **send a copy** of the policy.

* Required, if obtainable and one has been issued, whether or not this person is applying.

Part B: Subsidized Health Insurance You May Be Eligible For

Are you or any member of your family in one of the uniformed services? ☐yes ☐no

If **yes**, fill out the section below. (The uniformed services are the Army, Navy, Air Force, Marine Corps, Coast Guard, Public Health Services, National Oceanic and Atmospheric Administration, and the National Guard or Reserves.)

1. Name:

Active Duty? ☐yes ☐no | Retiree? ☐yes ☐no | Reserves? ☐yes ☐no | Medal of Honor? ☐yes ☐no

2. Name:

Active Duty? ☐yes ☐no | Retiree? ☐yes ☐no | Reserves? ☐yes ☐no | Medal of Honor? ☐yes ☐no

Have you or any member of your family served in the U.S. military or can you be considered a dependent of someone who has served in the U.S. military?

☐Yes, I have served. Name:

☐Yes, I am a dependent of someone who has served. Name:

☐No, I am neither a veteran nor a dependent.

American Indian/Alaska Native

Certain American Indians and Alaska Natives may not have to pay MassHealth premiums and copays.

Are you or any member of your family who is applying a federally recognized American Indian or Alaska Native who is eligible to receive or has received services from an Indian health-care provider or from a non-Indian health-care provider through referral from an Indian health-care provider? ☐yes ☐no

If **yes**, name of person(s):

General instructions for filling out the Injury, Illness, Disability, or Accommodation, Absent Parent, and U.S. Citizenship/National Status and Immigration Status sections below

The HIV section is optional. You must answer all questions in each of the three sections after the HIV section.

HIV Information (optional) HIV

MassHealth may give benefits to people who are HIV positive who might not otherwise be eligible.

Do you or any family member who is HIV positive want to apply for these benefits? ☐yes ☐no

If **yes**, fill out this section.

Send proof of income, U.S. citizenship/national status and identity, or qualified alien status to see if you can get benefits for up to 60 days while we wait for you to send us proof of your HIV-positive status. For more information, see the MassHealth Member Booklet.

Name(s):

Injury, Illness, Disability, or Accommodation

Do you or any family member have an injury, illness, or disability (including a disabling mental-health condition) that has lasted or is expected to last for at least 12 months? (If legally blind, answer **yes**.) ☐yes ☐no

Do you or any family member need health care because of an accident or injury? ☐yes ☐no

Do you or any family member applying for MassHealth require a reasonable accommodation because of a disability or injury? ☐yes ☐no

If you answered **yes** to any of these three questions, you must fill out **Supplement A** (the blue sheet).

Absent Parent

Has any child in the household been adopted by a single parent or has a parent who is deceased or unknown? ☐yes ☐no

Does any child in the family have a parent who does not live with you who is not included in the previous question? ☐yes ☐no

If you answered **yes** to either of these questions, you must fill out **Supplement B** (the yellow sheet).

U.S. Citizenship/National Status and Immigration Status

The U.S. citizenship/national status of parents does not affect the eligibility of their children.

U.S. Citizens

For applicants **born in Massachusetts** who want help getting proof of their U.S. citizenship, please fill out **Supplement D** (the red sheet).

For applicants **born outside Massachusetts** who want help getting proof of their U.S. citizenship, MassHealth may be able to help you. Please call MassHealth Customer Service at 1-800-841-2900 (TTY: 1-800-497-4648 for people who are deaf, hard of hearing, or speech disabled).

Persons who are not U.S. citizens/nationals

If you or any other family member applying for MassHealth or Commonwealth Care fits any of the immigration status codes on **Supplement C** (the orange sheet), numbered 1 through 17, you must fill out **Supplement C**.

If you or any other family member applying for benefits does not fit any of the immigration status codes on **Supplement C** (the orange sheet), numbered 1 through 17, you or that family member may get only one or more of the following: MassHealth Limited, Healthy Start, CMSP, or the Health Safety Net. You do not have to fill out **Supplement C**.

Note: A social security number is not required for approval for MassHealth Limited. We will not match the names of applicants for MassHealth Limited with any other agency including the Department of Homeland Security (DHS). You do not need to send proof of immigration status. MassHealth Limited pays for emergency services only. See the MassHealth Member Booklet for more information.

List below the names of family members who want to get only one or more of the following: MassHealth Limited, Healthy Start, CMSP, or the Health Safety Net.

Name(s):

Name(s):

CommCare Plan Choice Form

The next pages show the "plan choice form" received when they were accepted to CommCare (after submitting the application form shown above). The form is a letter that shows an enrollee their plan choice options and associated premiums and refers enrollees to a website for more information on plans (e.g., on provider networks). The form prompts enrollees to go online, call the Connector, or return the form by mail to choose a plan. For the 0-100% of poverty group we study, all plans have a premium of $0 (as shown), but for higher-income groups the correct premium amounts would be shown. Higher-income groups would also need to return the first month's premium payment when they choose a plan.



Your **connection** to good health

[Mail_date]
[Case_Name]
[Case_Street]
[Case_City], [Case_State] [Case_Zip]

Dear [Insert Name]

Welcome to Commonwealth Care. Here is the enrollment package you requested. This information will help you select and enroll in the health plan that is right for you. Your package includes:

- ***Getting Started***, a brochure about Commonwealth Care that explains the program and how to enroll.
- ***Health Benefits and Copays***, a chart that lists your health benefits and how much you pay for each health visit or service (copays).
- ***Health Plan Information***, descriptions of each health plan available to you and any special programs they offer. The health plans available to you depend on where you live, your plan type and in some cases, whether you've been previously enrolled with Commonwealth Care or MassHealth.
- ***Enroll Now***, information and instructions for selecting and enrolling in a health plan.

There are a lot of benefits to enrolling in Commonwealth Care: you get your own health care provider, regular checkups, care when you are sick or injured, prescriptions, treatment for alcohol, drug abuse and mental health problems, vision care and free glasses. Some members also receive dental benefits (Plan Type 1 only).

You can enroll in Commonwealth Care over the phone and online.*

1. **By phone**: Call the Commonwealth Care Member Service Center Monday - Friday, from 8:00 a.m. to 5:00 p.m. at 1-877 MA ENROLL (1-877-623-6765) TTY 1-877-623-7773 for people with partial or total hearing loss.
2. **Online**: Enroll using the Commonwealth Care website at www.MAhealthconnector.org. Read the instructions on the back of this letter to learn how to create an account and log in.

If you have any questions, call the Commonwealth Care Member Service Center Monday - Friday, from 8:00 a.m. to 5:00 p.m. at 1-877 MA ENROLL (1-877-623-6765) TTY 1-877-623-7773 for people with partial or total hearing loss.

We are pleased to offer you a full range of health benefits and be your connection to good health.

Commonwealth Care Member Service Center

Turn to review your health plan options

Member ID

Enroll Now! Select and Enroll in a Commonwealth Care health plan

Below are the Commonwealth Care health plans you can choose from. The dollar amount next to each health plan is what you must pay each month to stay enrolled in that plan. If you select a health plan with $0.00 next to it, you will not be charged a monthly premium. The premiums listed below are based on your plan type, which depends on your income and your family size. Based on the information you provided, you are eligible for **Plan Type X**.

1. Choose your health plan and premium. Choose only one.

These plans are available to you. Read each Health Plan Information description to learn about the Commonwealth Care health plans.

<BMC HealthNet Plan	$0.00	web address	Phone number>
<CeltiCare Health Plan	$0.00	web address	Phone number>
<Fallon Community Health Plan	$0.00	web address	Phone number>
<Neighborhood Health Plan	$0.00	web address	Phone number>
<Network Health	$0.00	web address	Phone number>

2. Choose your Primary Care Provider (PCP).

Tell us the name of your PCP when you select your health plan by phone or online.* When choosing a health plan, check to see if the doctors, hospitals or community health center you visit today are part of the plan you would like to select. To find out if a provider is in a certain health plan, look on our website or call the doctors, the health plans, or the Commonwealth Care Member Service Center.

You have selected_____**as your Primary Care Provider (PCP).**
First Name Last name

3. Enroll by phone, or online.* Enroll by phone or on our website. Commonwealth Care will send you a bill if you need to pay a monthly premium. After you pay your first monthly premium, you will be in Commonwealth Care. If you do not need to pay a monthly premium, Commonwealth Care will enroll you in your selected health plan.

If this is your first time using the website, follow the instructions below.

Create an account

1. Log on to www.MAhealthconnector.org
2. Click **Register** for access to your account
3. Click **Create Login** then follow the instructions on each screen

* If you are unable to call or go online, circle the health plan of your choice, write in the name of your PCP and mail this page to:
Commonwealth Care Member Service Center, 133 Portland St, 1st Floor, Boston MA 02114-1707.
DO NOT A SEND PAYMENT with your health plan selection.

A.2 American Community Survey (ACS) Dataset

We begin with ACS data from 2008-2011.[46] We begin by defining family income as a share of the poverty line, analogous to the measure used by CommCare. Specifically, we sum total personal income across all members of an individual's "health insurance unit" (HIU), a variable defined by the University of Minnesota's SHADAC to approximate family unit definitions used by public insurance programs. We divide this total income by the FPL defined by the year and the HIU size.

We then define people as CommCare eligible if they are U.S. Citizens in the relevant age range (19-64) and income range (less than 300% FPL) who are not enrolled in another form of health insurance (specifically, employer insurance, Medicare, or Tricare) and are not eligible for Medicaid (based on income and demographics). We restrict to U.S. citizens because most non-citizens are ineligible for CommCare and we drop non-citizen immigrant enrollees from our main CommCare dataset.

We further drop individuals who are eligible for Medicaid (MassHealth) instead of CommCare based on income and family demographics. We cannot directly measure Medicaid eligibility in the ACS.[47] Instead, we approximate it by excluding the two largest groups we know are Medicaid eligible: parents with income below 133% of FPL, and the disabled (proxied by under 65 and SSI receipt). Parents with dependents under 18 are eligible for Medicaid below 133% FPL and eligible for CommCare above this cut-off.

We use this final sample, along with ACS population weights supplied in the IPUMS extract, to estimate the number of people eligible for CommCare with family incomes below 100% of poverty in our main year (2009) and other surrounding years. We use reported insurance status to estimated the number of CommCare-eligible uninsured people in this income group.

A.3 Sample Summary Statistics

Table A.1 shows summary statistics on CommCare enrollment for the 0-100% of FPL treatment and 100-200% of FPL control groups over the fiscal year 2007-2011 period, broken down into: (1) the initial auto-enrollment period in 2007 when participants in the state's Uncompensated Care Pool were auto-converted into CommCare, (2) the main auto-enrollment period of 2008-2010m1, and (3) the no auto-enrollment period (2010m2-2011), excluding the three months at the end of 2010 when it was temporarily reinstated. See Section 2.3 for a description of the sample construction. Table A.2 shows additional statistics on enrollee attributes among new enrollees in our 0-100% of FPL group.

A.4 Monthly Enrollment Data

Our main enrollment analysis is conducted at a bimonthly level, averaging the number of new enrollees into CommCare across pairs of months. We do this because of several cases where auto-enrollment appears to have been suspended for a month, followed by a larger number of auto-enrollees the next month. Averaging across pairs of months smooths over this noise in the data and lets us improve the precision of our estimates. For completeness, Figure A.1 shows the monthly count of new enrollees in the 0-100% of poverty group (analogous to the similar Figure 1 in the main text).

[46] We obtained ACS data from the IPUMS-USA website (Ruggles et al., 2015).

[47] We cannot even directly measure Medicaid enrollment; the ACS does not distinguish between Medicaid and CommCare (both are coded as "Medicaid/other public insurance").

Table A.1: Sample Summary Statistics: Enrollment

	Initial Period with Auto Enr ***2007*** (1)	**Main Period with Auto Enr** ***2008-2010m1*** (2)	**No Auto Enr Period** ***2010m2-2011*** (3)
Total market enrollment (monthly avg.)			
0-100% FPL	37,059	73,304	69,706
100-200% FPL	4,799	55,014	62,762
New enrollees per month			
0-100% FPL	8,231	4,691	2,429
Share Active	51%	66%	100%
Share Passive	49%	34%	0%
100-200% FPL	1,823	3,959	1,996
Re-enrollees per month			
0-100% FPL: Total	144	1,181	1,529
Active	15	206	1,529
Passive	129	975	0
100-200% FPL	10	826	1,663

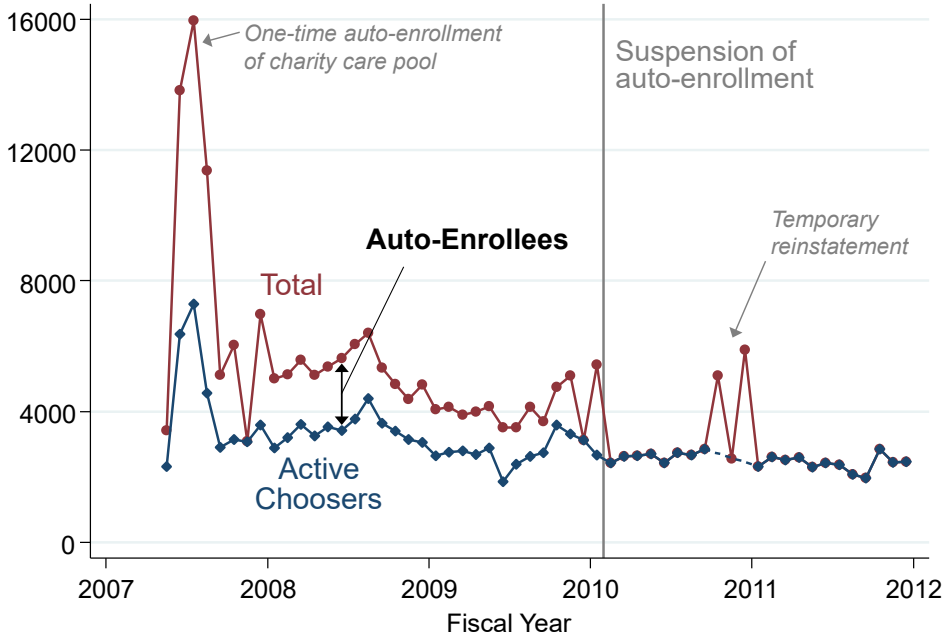
NOTE: The table shows CommCare enrollment patterns for the 0-100% of FPL treatment group and 100-200% of FPL control group over fiscal years 2007-2011. Column (1) shows statistics for the initial FY 2007 period with auto-enrollment in place, during which the exchange was just starting and there was a large auto-enrollment of Uncompensated Care Pool enrollees. Column (2) shows the main 2008-2010m1 period with auto-enrollment in place, and column (3) shows the 2010m2-2011 post-period when auto-enrollment was canceled. Column (3) excludes the three months at the end of 2010 when auto-enrollment was temporarily reinstated.

Table A.2: Sample Summary Statistics: Enrollee Attributes

A. Demographics (new enrollees, 0-100% FPL)	
Share Male	0.557
Age (mean)	34.2
Share Age 19-34	0.581
Share Age 35-54	0.308
Share Age 55+	0.111
Income (% of FPL)	26.4
B. Health Measures (new enrollees, 0-100% FPL)	
Any Chronic Illness	0.597
Risk Score (HCC)	0.926
C. Cost Measures (new enrollees, 0-100% FPL)	
Avg monthly spending	$369.3
Enrollment duration (months)	14.9

NOTE: The table reports means for new enrollees entering over the period 2008-11 in the 0-100% of FPL "treatment" group subject to auto-enrollment. All variables with the exception of enrollment duration are weighted by number of months enrolled (capped at 12 total).

Figure A.1: Count of New Enrollees per Month in CommCare (0-100% of poverty)



NOTE: The graph shows counts of new enrollees per month into the CommCare market for the <100% of poverty group subject to the auto-enrollment policy. This graph shows the monthly raw data underlying the bimonthly averages shown in Figure 1 and used in our empirical analysis. The CommCare market starts in fiscal year 2007, and auto-enrollment is in place from 2007 to the end of 2009, plus a temporary reinstatement period at the end of 2010. The red series shows total new enrollment, and the blue series shows the count of "active choosers" who actively chose a plan when newly enrolling. The gap between these series represents the number of passive auto enrollees. The large spike in passive enrollment in 2007 comes from a one-time auto-enrollment of charity care pool enrollees (see discussion in Section 2.1). The dashed line for the blue series at the end of 2010 indicates that we lack data separating active vs. passive enrollees during this period.

B Appendix: Robustness Analyses on Auto-Enrollment Impacts

B.1 Evidence against Conditionally Passive: No Change in Composition of Active Enrollees

B.2 Effect of Auto-Enrollment on Re-Enrollment

In the main results, we limited our analysis to new (first-time) enrollees, and exclude re-enrollees who are returning to the market after some period of not being enrolled. Including re-enrollees would complicate our main analysis, since re-enrollees faced different auto-enrollment rules and the number of re-enrollees mechanically increased over time with the age of the marketplace. In this Appendix section, we present results testing the robustness of our main finding to including those re-enrollees.

Re-enrollees were auto enrolled one of two ways, depending on the length of their absence prior to re-enrolling: (1) those with a gap in enrollment of 13+ months were treated as new enrollees, while (2) those who had been away for $\leq$12 months were immediately enrolled in their previous plan without having to take any action (though they could switch ex-post). Further, among $\leq$12 month re-enrollees, auto-enrollment was used for a broader set of income groups prior to 2009, including for enrollees above 100% of poverty that were part of our control group for the main analysis. We therefore cannot perform the same difference-in-difference analysis for $\leq$12 month re-enrollees.

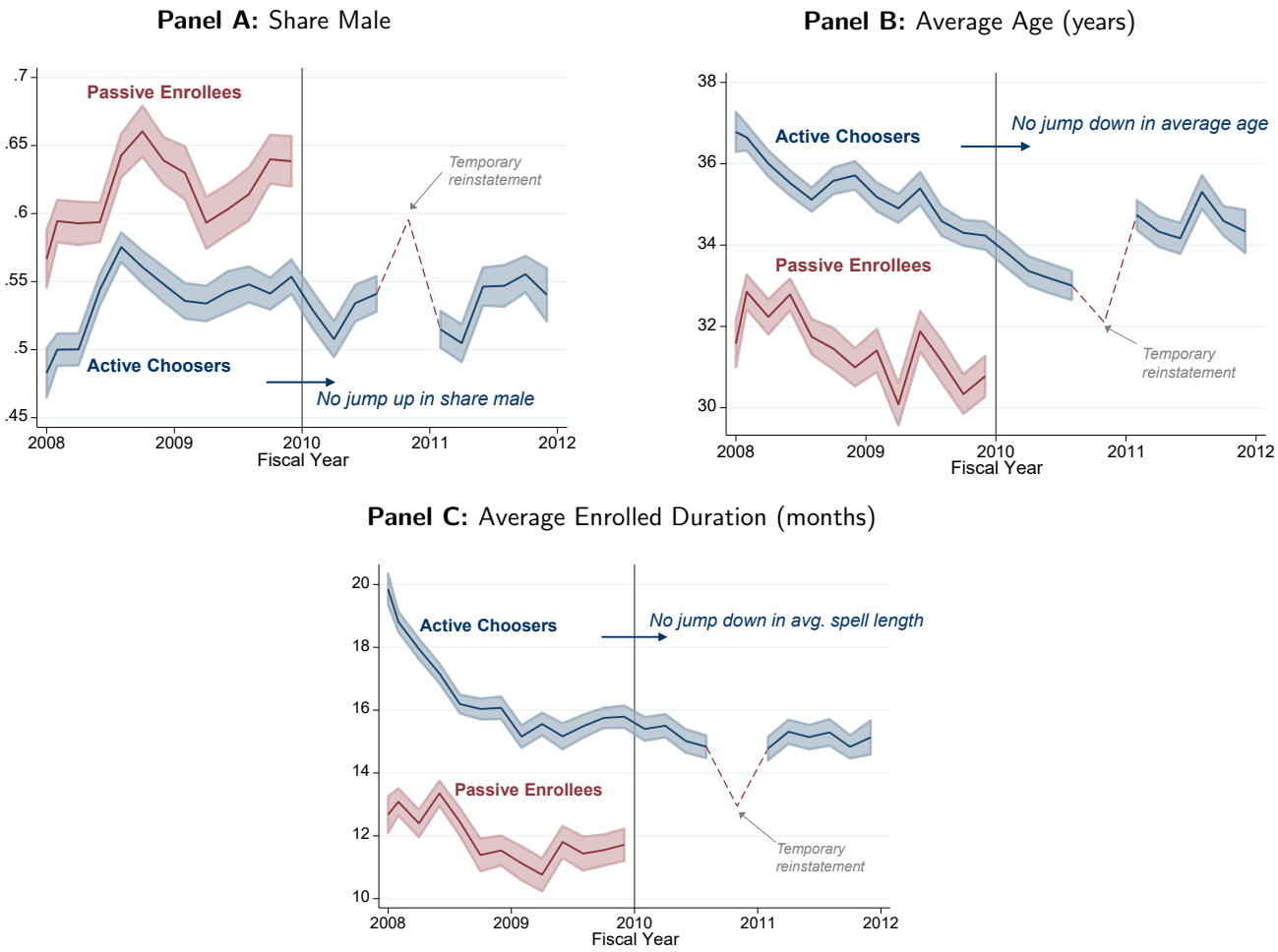
In what follows, we first analyze the robustness of adding 13+ re-enrollees to our main sample of new enrollees, since both groups faced similar auto-enrollment rules and there is a valid control group for both. We then show changes in the flow of $\leq$12 month re-enrollees around the policy change for 0-100% of poverty enrollees without a control group.

Including 13+ Month Re-enrollees in Main Estimates

We start by adding re-enrollees returning after an absence of at least 13 months into our main estimates including new enrollees. This is straightforward, since they were subject to the same auto-enrollment rules as new enrollees. We directly reproduce the analysis in Section 3 combining the number of new and the 13+ month returning enrollees. The flow of 13+ month re-enrollees is initially quite small relative to the number of new enrollees, since the marketplace itself is less than 24 months old at the start of fiscal year 2009. The number of returning below-poverty enrollees steadily increases over time but never rises above 600 re-enrollees per month by the end of fiscal year 2012 – less than a sixth of the average flow of new enrollees under auto-enrollment. We include 13+ month re-enrollees with incomes of 100-200% of poverty in the control group as well. As in the main analysis, above-poverty 13+ month re-enrollees were never subject to auto-enrollment.

The results are shown in Figure A.3. Due to the relatively small share of 13+ month re-enrollees in the population, it is perhaps unsurprising that our results do not qualitatively change with their inclusion. The main DD estimate for the impact on enrollment is a 39.1% reduction, slightly larger than the 32.6% decrease found for new enrollees alone in Figure 2. As in the main results, the DD estimate for active enrollment is still close to zero and statistically insignificant. The point estimate,

Figure A.2: Evidence against Conditionally Passive: No Jumps in Active Enrollee Characteristics



NOTE: The figure examines whether there are changes in the average characteristics of active new enrollees at the suspension of auto-enrollment (start of 2010), which could indicate the presence of "strategically passive" types (see Section 3.1 for a definition). If there were strategically passive types, we would expect a jump in the mean for active enrollees towards the mean for the passive enrollees, as some people switch from being passive to active without auto-enrollment. We see no evidence of this for three key characteristics: share male (panel A), average age (panel B), and average enrollment spell length (panel C). Along with the absence of increase in active new enrollment (see Figure 2B), this suggests that passive behavior is largely exogenous to the auto-enrollment policy. Note that the dashed red lines indicate the auto-enrollment temporary reinstatement period during which our data are missing the indicator for passive status, so the data point reflects the average of passive and active enrollees.

which is slightly negative, continues to be inconsistent with the presence of "conditionally passive" types, which would predict an increase in active enrollees after the policy change.

We now analyze impacts for re-enrollees returning to CommCare within 12 months of the end of their last spell – who we call "short-gap re-enrollees." The monthly numbers of short-gap re-enrollees are substantial, averaging around 1,450 re-enrollees per month during the pre-period (the first 11 months of fiscal year 2009) – roughly a third of the number of new enrollees. Our analysis for short-gap re-enrollees needs to differ for three reasons. First, short-gap re-enrollees were *automatically* re-enrolled in their previous plan, without being given a chance to actively choose. Hence, we cannot distinguish active vs. passive types – essentially all are labeled as auto-enrollees in the data – and instead focus solely on the effects on the *total* number of short-gap re-enrollees re-joining the market each month. Second, we do not have a valid control group for this analysis because auto-enrollment also applied to higher-income re-enrollees above 100% of poverty. As a result, we show results based on a simple pre/post enrollment change, without a control group. Third, the timing of the policy change is slightly different. Auto-enrollment for short-gap re-enrollees was ended in FY 2009m11, two months prior to the end of auto-enrollment for new enrollees (in 2010m1).

Figure A.4 shows the flow of short-gap re-enrollees, with the units rescaled so that the pre-period mean is 1.0. This flow drops sharply when auto-enrollment is suspended. The overall pre/post estimated decline is 35.3%. This is roughly similar to the main estimate on new enrollees (-32.6%), suggesting that our main estimates in the paper are a faithful representation of the overall effect of suspending auto-enrollment.

B.3 Impact on Steady State Enrollment

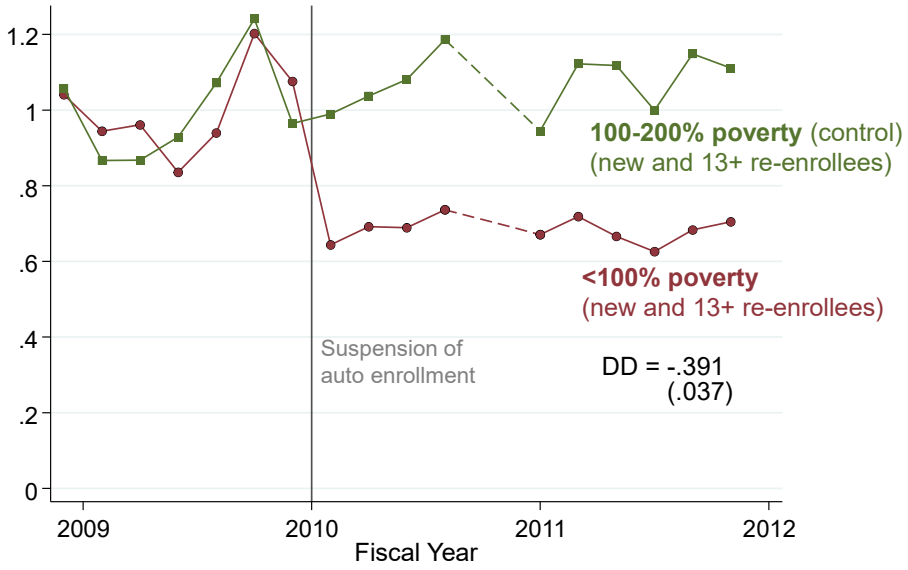
Start with a simple framework for the calculation. Suppose that there are $g \in \{1, ...G\}$ types of enrollees, each of which has a constant enrollment inflow into the market of E_g people per month and an exit rate of x_g. Total enrollment among type-g enrollees at time t is determined by the stock/flow equation: $N_{g,t} = (1 - x_g) N_{g,t-1} + E_g$. In steady state ($N_{g,t} = N_{g,t-1}$) total type-$g$ enrollment is $N_g^{SS} = E_g/x_g$. Total steady-state market enrollment is $N^{SS} = \sum_g N_g^{SS}$.

Now apply the framework to the CommCare market. Define g types simply as passive (P) and active (A) enrollees; the results are similar if we interact these with age-gender groups. Figure 1 shows that constant enrollment inflow (separately for actives and passives) is a reasonable approximation for 2008-on, and Appendix Figure A.5 suggests the same is true for the exit rate. Using the final six months auto-enrollment is in place as the estimation period, we estimate $\{E_A, E_P\} = \{3013, 1366\}$ and $\{x_A, x_P\} = \{0.0648, 0.0917\}$. These imply that $N_A^{SS} \approx 46,500$ and $N_P^{SS} \approx 14,900$, and $N^{SS} \approx 61,400$. This suggests that ending auto-enrollment decreases steady-state market size by about 32% of steady state active enrollment ($= 14,900 \,/\, 46,500$).

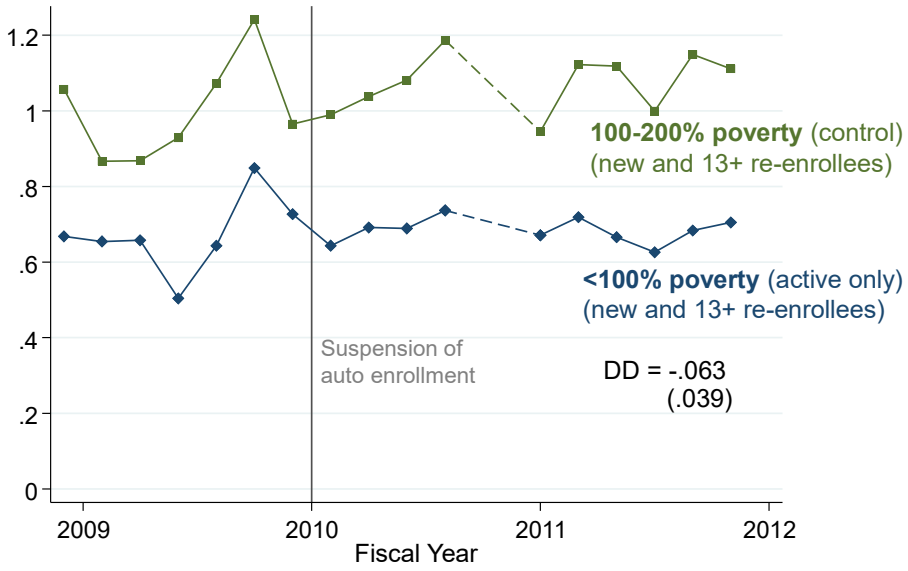
Figure A.6 compares this calculation to data on actual CommCare enrollment for the relevant 0-100% poverty group. The plot shows the total stock of enrollment over time, both overall (green)

Figure A.3: Effect of Auto Enrollment Suspension on Combined New and Re-enrollment Following $\geq$ 13 Month Gap (DD Estimates)

Panel A: Total New + 13+ Month Re-enrollees per Month *(scaled, 1.0 = pre-period mean)*

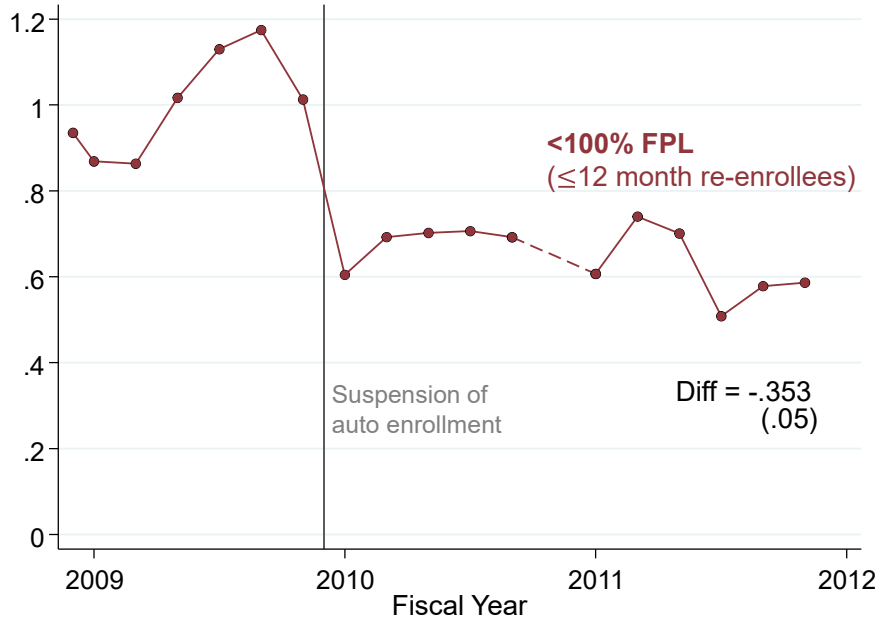


Panel B: Active New + 13+ Mon. Re-enrollees per Month *(scaled, 1.0 = pre-period mean)*



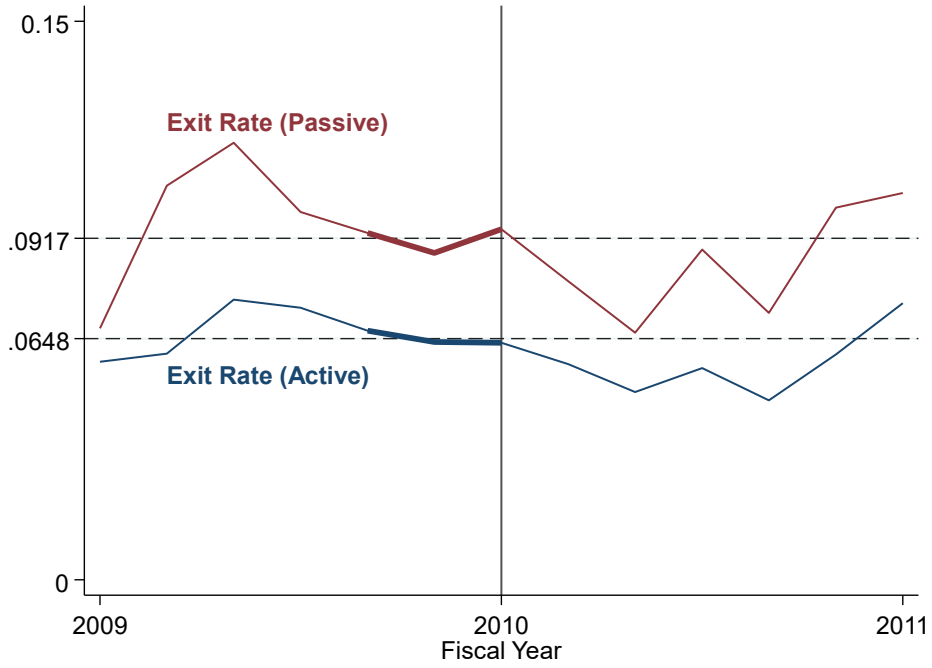
NOTE: The figure shows data on the scaled sum of new enrollment and 13+ month re-enrollment per month into the CommCare market and estimates of the difference-in-difference specification (1) for estimating the causal effect of the suspension of auto-enrollment at the start of 2010. Each panel compares trends for below-poverty enrollees (the treatment group subject to auto-enrollment pre-2010) versus 100-200% of poverty enrollees (the control group not auto enrolled). Each income group's series is rescaled by dividing by the group's pre-period mean new enrollment, which makes DD estimates interpretable as a percent change. Panel A shows that *total* new amd re-enrollment falls sharply (by 39.1%) for the treatment group at the start of 2010, consistent with a causal effect of the policy. Panel B shows that the number of *active* new and re-enrollees is flat through the policy change, consistent with there being few if any "strategically passive" types (see Section 3.1 for a definition). These results are qualitatively similar to the results reported in the main paper excluding all re-enrollees.

Figure A.4: Fall in Flow of Short-Gap Re-enrollees (with $\leq$ 12 month gap)



NOTE: The figure shows data on the scaled number of below-poverty $\leq$ 12 month re-enrollees per month into the CommCare market, with the pre-period mean scaled to be 1.0. It shows estimates of the pre/post difference after the suspension of auto enrollment at the end of 2009. As noted in the text, we cannot implement a difference-in-difference analysis because the control group (enrollees with incomes $>$ 100% of poverty) is also subject to the auto-enrollment policy.

Figure A.5: Exit Rate per Month for Active vs. Passive Enrollees

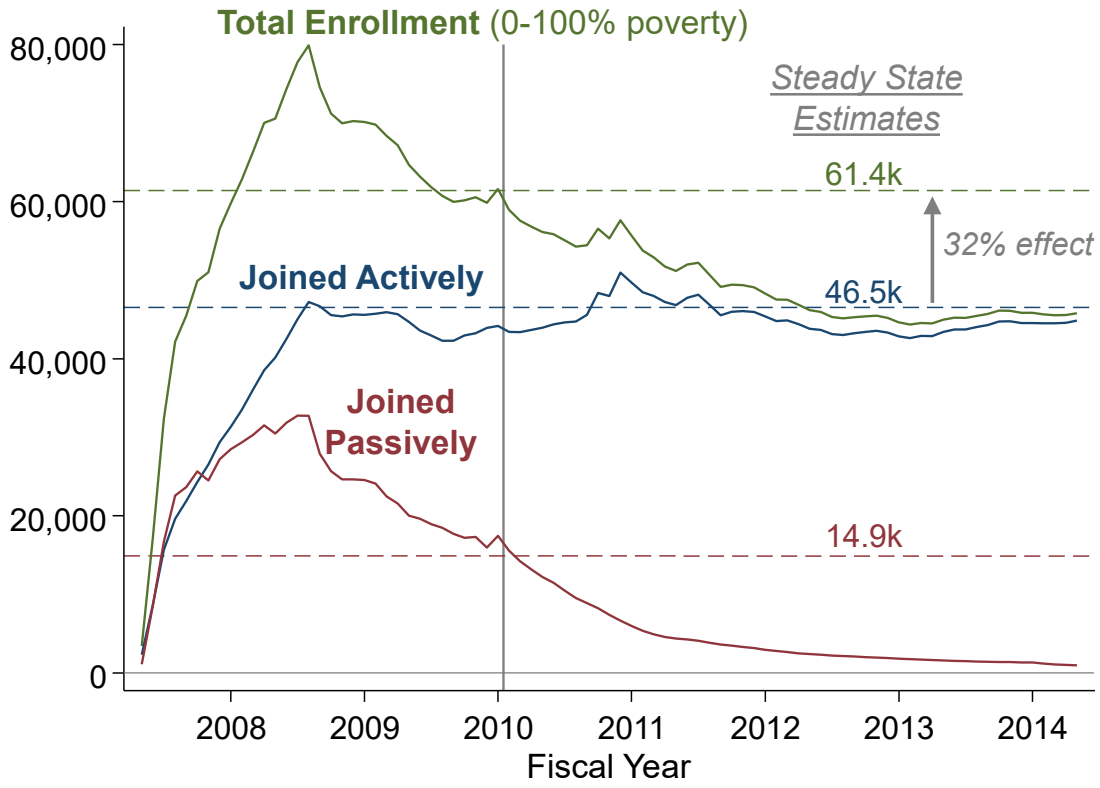


NOTE: The figure plots the exit rates in bi-monthly bins for active (blue) vs. passive (red) enrollees as an input to our steady state market size categories. The segments of each curve shown in bold are the samples used to estimate the average exit rates for each category, corresponding to the final six months auto-enrollment is in place.

and separately by whether each enrollee initially joined the market actively (blue) or passively (red).[48] The estimates from the steady-state calculation above are indicated with horizontal dashed lines. Both active and passive enrollment rise quickly during the first year of the market (up to mid-2008). Active enrollment then stabilizes near the steady-state value of 46,500 and remains remarkably stable over the next five years. Passive enrollment declines in 2008-09 – consistent with the gradual exit of the 2007 surge in auto enrollees – but starts to stabilize in late 2009 near the steady state level. It then declines towards zero once auto-enrollment is suspended. Overall, these enrollment trends are remarkably consistent with the simple back-of-the-envelope calculation, suggesting that the estimate of a 32% effect on steady-state enrollment is reasonable.

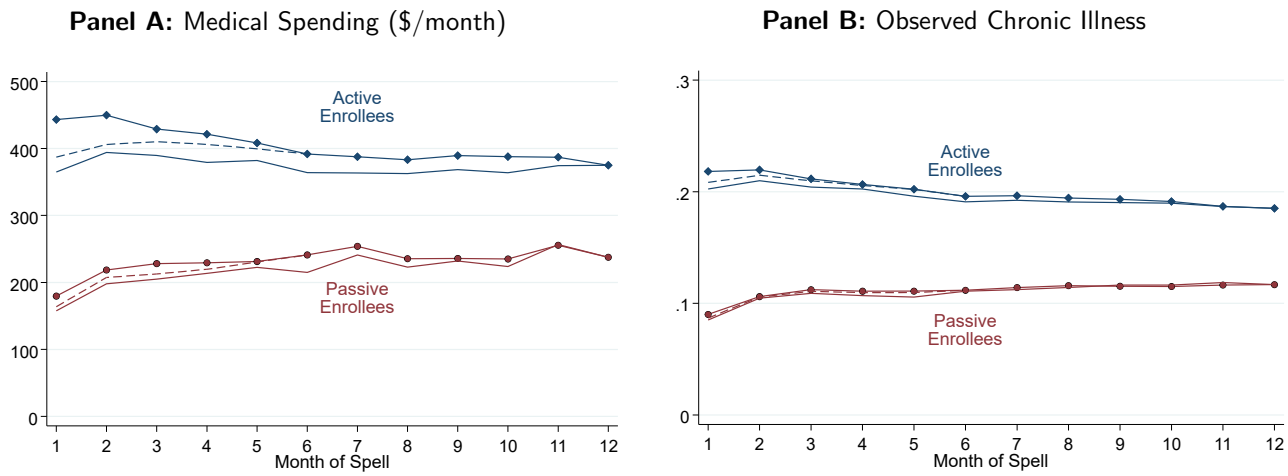
[48] Consistent with our analysis of new enrollees, we restrict the count to people in their first enrollment spells; we analyze re-enrollees separately in Appendix B.2.

Figure A.6: Total CommCare Enrollment (0-100% poverty), by Whether Joined Actively/Passively



NOTE: The figure plots the stock of CommCare enrollment over time in the 0-100% of poverty group subject to auto-enrollment, both overall (green) and separately by whether each enrollee initially joined the market by actively choosing (blue) or passively (red). The enrollment counts are restricted to individuals during their first enrollment spell to be consistent with our empirical analysis of new enrollees (since rules differed for re-enrollment). The horizontal dashed lines indicate the steady-state enrollment estimates (for total, active, and passive enrollment) from the back-of-the-envelope calculation described in the text. The vertical gray line indicates the suspension of auto-enrollment. Because of incomplete data, we label all enrollees during the temporary reinstatement period (final three months of 2010) as active; this may account for the active enrollment uptick during this period. Overall, both the steady state calculation and analysis of the raw data indicate that passive enrollees represented about 32% of steady-state active enrollment.

Figure A.7: Monthly Health Measurement Over First 12 Months of Spell



NOTE: The figures show the monthly rate of health measures separately for active and passive enrollees over the first 12 months of the enrollment spell. The solid line with markers plots the unconditional mean for each group across all enrollees in each month of their enrollment. The solid line without markers gives the mean in each month of the spell, only for enrollees who stay in CommCare for at least 12 months. The dashed line without markers gives the mean in each month of the spell, only for enrollees who stay in CommCare for at least 6 months.

C Appendix: Additional Analysis of Passive Enrollees

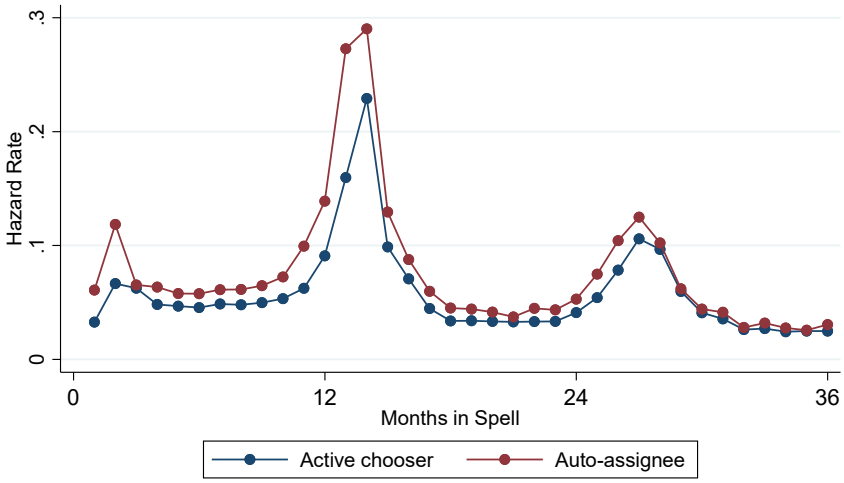
C.1 Robustness of Health Differences to Measurement Period

Medical diagnoses are only measured when individuals interact with the health care system. Therefore, those enrolled in CommCare for longer periods could be measured as sicker simply because they have more opportunity to be measured, rather than due to true health differences. Because active enrollees stay enrolled in CommCare for longer durations on average than passive enrollees (see Table 2), we show robustness of the measured health differences by comparing monthly rates of observed health diagnoses between the two groups. We also do the same for average medical spending, which is less likely to be mechanically influenced but could show different time paths.

Figure A.7 plots monthly rates of two measures: (A) total health spending and (B) chronic illness diagnoses. Note that the *monthly* rate of chronic illnesses is mechanically lower than the *annual* rate (as reported in Table 2) because the latter counts people ever observed with a chronic illness during a whole year.

We find persistent differences in monthly means, with passive enrollees consistently healthier than active. The solid lines with markers are raw means by month during an enrollee's spell; the dashed and solid lines (with no markers) condition on a balanced panel of individuals who stay enrolled at least 6 and 12 months, respectively. The differences in spending and chronic illnesses are remarkably consistent over time and steady even when conditioning on a balanced panel. These findings suggest differences in observed health between active and passive enrollees reflect differences in underlying health and/or health care usage rather than differences in length of time enrolled in CommCare.

Figure A.8: Exit Hazard Rate from CommCare: Active vs. Passive Enrollees



NOTE: The graph shows the hazard rate of spell endings for active choosers (blue) vs. passive enrollees (red, or "auto-assignees"), by month since the start of the enrollee's spell in CommCare. The hazard rate is the share of enrollees whose spells end just after month t as a share of enrollees remaining through month t. This helps interpret the shorter enrollment durations for passive enrollees. Hazard rates are higher for passive enrollees in every month up to month 28 (after which they are more similar). But the gap is largest in two periods: (1) in months 1-2 of the enrollment spell, and (2) in months 12-14, which coincides with the timing of annual eligibility recertification. The former may be consistent with either mistakes (rectified in 1-2 months by the individual opting out) or with passive enrollees needing coverage for very short periods (e.g., between jobs). The latter is consistent with passive enrollees being less likely to respond to recertification paperwork when mailed to them – just as they failed to respond to the initial approval letter asking them to choose a plan.

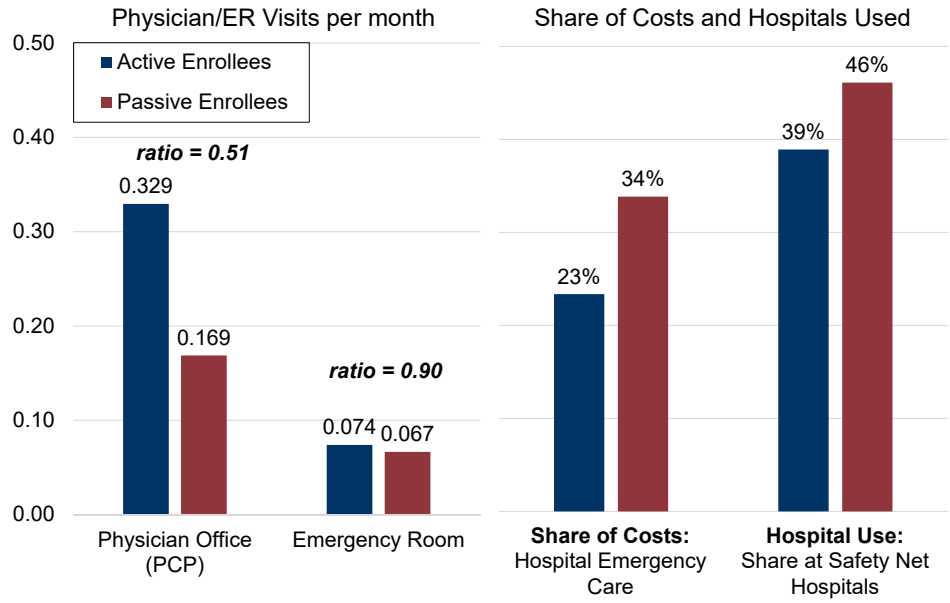
C.2 Understanding Enrollment Durations for Active vs. Passive Enrollees

Figure A.8 shows the hazard rate of exit from CommCare after each month in an enrollment spell. It compares active choosers (blue) versus passive auto-enrollees (red). Passive enrollees have higher exit hazards in nearly all months over the first two years of a spell, but the (level and proportional) differences are largest at two times. First, passive enrollees are much more likely to exit after months 1-2 of a spell, consistent with a brief need for health insurance coverage (e.g., between jobs). Second, passive enrollees are much more likely to exit after months 12-14 of a spell. We do not directly observe the reason for this spike, but we know that this is is coincident with the timing of annual eligibility redetermination. Exit rates spike for both active and passive enrollees at this time, but the spike is larger for passive enrollees. This may be consistent with their failure to complete redetermination paperwork, a major reason that enrollees' coverage is terminated.

C.3 Active vs. Passive Use of Standard Sources of Charity Care

Figure A.9 shows several pieces of evidence that passive enrollees, though healthier (and therefore lower spending), obtain a *larger share* of their care from standard sources of charity care. The left two sets of bars show patterns of use of physician office visits (a form of elective care less likely to be available via charity care) versus emergency room use (the classic source of charity care). Consistent with being healthier, passive enrollees are less likely to use both measures, but the ratio is quite

Figure A.9: Utilization of Common Sources of Charity Care



NOTE: The graph compares active and passive enrollees on several measures of use of common sources of charity care. The first two sets of bars show monthly rates of physician office visits (less likely to be obtained via charity care) versus emergency room visits (the classic source of charity care). The third bars show the share of enrollees' total costs that occur through emergency hospital care, including both the ER visit and any subsequent admission. The fourth bar shows the share of hospital use (weighted by cost) that occurs at safety net hospitals, a state-designated category based on having high public-payer and uninsured shares.

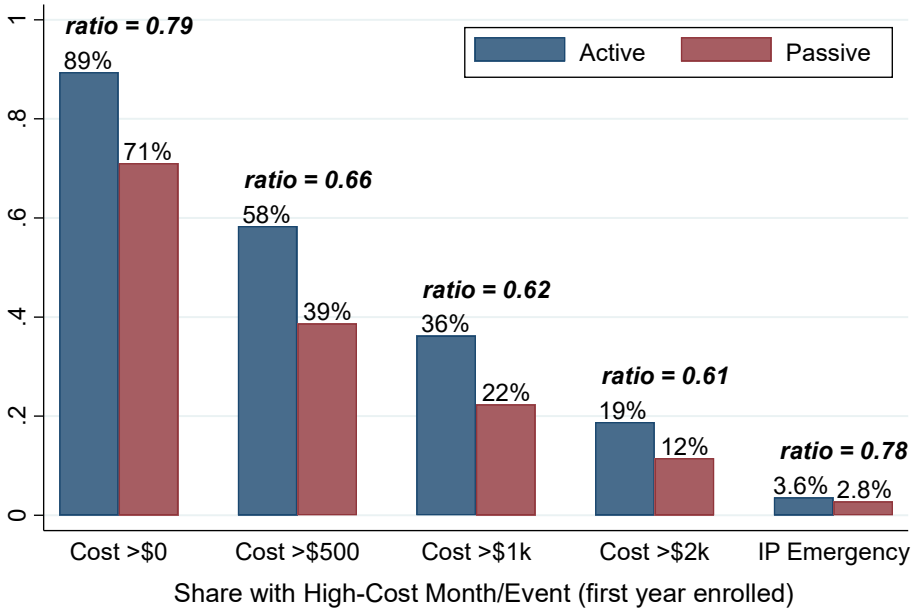
different. They visit a physician's office 51% as frequently as active enrollees, but use emergency rooms 90% as frequently as active enrollees. Consequently, a greater share of passive enrollees' total medical spending is due to hospital-based emergency care (34%; this includes both the ER visit and any subsequent admissions) than for active enrollees (23%).

The final panel breaks down the share of hospital care (weighted by cost) that occurs at safety net hospitals – a designation of the state of Massachusetts based on a hospital having a high public-payer and uninsured share. Consistent with living closer to safety net hospitals, passive enrollees obtain 46% of their hospital care from these hospitals, versus 39% for active enrollees.

C.4 Medical Shocks for Active vs. Passive Enrollees

Figure A.10 compares active vs. passive enrollees on their rates of experiencing various proxies for expensive medical shocks during their first year enrolled. The first bar shows the probability of any medical spending, for context. The next three bars show the probability of experiencing a high-cost month, defined as spending exceeding \$500, \$1000, or \$2000. These are large spending amounts relative to the very low incomes of the below-poverty CommCare enrollees. The 2009 poverty line for an individual was \$903 per month, and the average income of passive enrollees is 20% of poverty. The final bar shows the probability of an emergency inpatient hospital admission. Across all of these measures, passive enrollees are *less* likely than active enrollees to experience the shock, but they still

Figure A.10: Rates of Medical Shocks for Active vs. Passive Enrollees



NOTE: The graph shows active and passive enrollees' rates of various expensive medical shocks during their first year enrolled, along with the risk ratio for passives / actives (shown above each set of vars). The first four bars are the likelihood of experiencing a single month with spending exceeding $0, $500, $1000 and $2000. The final bar is the probability of an emergency inpatient (IP) hospitalization, defined as a hospital admission that originated in the emergency department.

experience these shocks at meaningful rates – about 58-75% as frequently as active enrollees. This is comparable to the passive enrollees' risk scores, which are 63% as large as for actives (see Table 2). Passive enrollees are healthier on average, but they do experience meaningful medical shocks.

D Appendix: Duplication of Coverage (APCD Analysis)

A question of particular interest is whether auto-enrollment leads to duplicate coverage by enrolling individuals with outside private insurance. However, a key limitation of the CommCare data is that we cannot observe insurance outside of the CommCare market. To assess coverage duplication, we draw on information from the Massachusetts All-Payer Claims Database (APCD).[49] The APCD lets us observe coverage in CommCare as well as nearly all other health insurance in the state, with the sole important exception being traditional Medicare, which is unlikely to to be relevant for the non-elderly, non-disabled population in CommCare. The APCD includes a synthetic ID that follows individuals across insurers, letting us observe duplicate coverage.

D.1 Data Construction Method

Using the APCD's member eligibility (ME) file, we construct an enrollment history dataset for people ever enrolled in CommCare that also includes their coverage history in other insurance. The data construction requires some care. Each record in the ME file describes a member's enrollment spell in a particular health plan, with variables describing the characteristics of the health plan (such as the plan's carrier), and the start- and end-dates of the spell. We use the variables "Insurance Type Code" (ME003) and "Special Coverage" (ME031) to define indicators for CommCare plans. Both variables include a category for CommCare enrollment; however, since they do not always coincide, we define our sample based on whether either variable indicates CommCare.

An additional challenge is that many records for BMC HealthNet (a large CommCare plan) enrollments have missing values for the end-date, specifically coded as "12/31/2099" or "12/31/2199." We find that these are often (in about 98% of cases) accompanied by another record with an identical start-date and a non-missing end-date. In these cases, we disregard the record with the missing end-date in the construction of our panel. In the remaining 2% of cases, we truncate the end-date to be 12/31/YYYY, where YYYY is the year of the report ("eligibility year", given by the variable ME004).

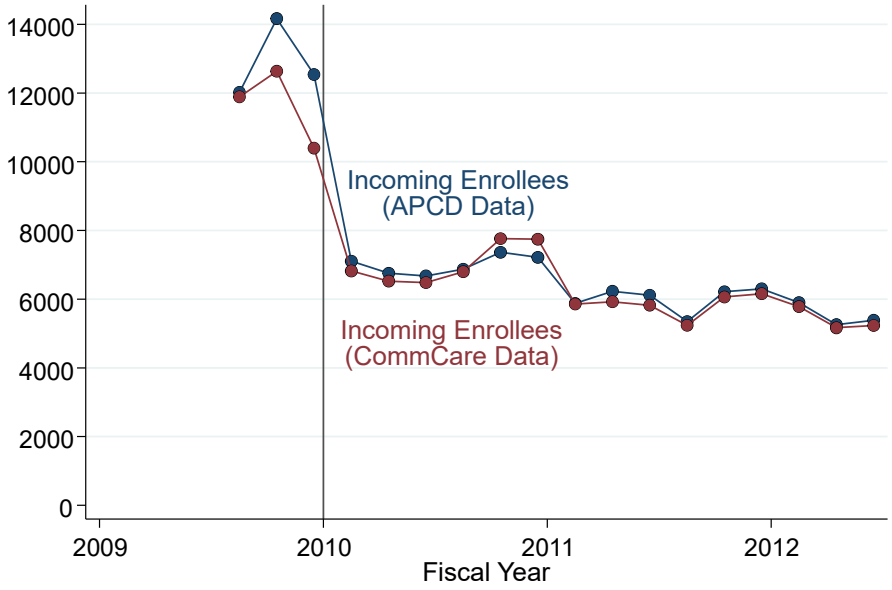
We validate the construction of this dataset by comparing it to the true CommCare enrollment data. The numbers line up quite closely. The APCD CommCare subset matches within 3% the member-month counts in the true CommCare data for fiscal years 2009-2013 (10.7 million in the APCD compared to 10.4 million true CommCare member-months). Enrollment across plans and over time also line up quite closely. Figure A.11 shows that the flow of incoming enrollees into CommCare (either as a new or re-enrollee) matches quite well in the APCD and CommCare datasets.[50]

With this panel dataset in hand, we turn to enrollment spells in other (non-CommCare) plans in the APCD. We restrict the analysis to enrollment in private coverage only – which includes employer-based, individual market, and Medicare Advantage plans but excludes Medicaid plans. We do this for

[49] We use the APCD version 3.0, which includes calendar years 2009-2013. The APCD, which is not linked to the CommCare data, was obtained under a separate data use agreement with Massachusetts' Center for Health Information and Analysis.

[50] Note that Figure A.11 includes all new and re-enrollees in all income groups, which is why the counts differ from what is shown in Figure 1 for 0-100% of poverty new enrollees only.

Figure A.11: Comparison of CommCare Enrollment in CommCare and APCD Datasets: Incoming Enrollees per Month



NOTE: Figure plots the number of incoming CommCare members in bi-monthly bins in both the administrative CommCare data (red) and in the APCD (blue). Incoming enrollees includes new enrollees and re-enrollees.

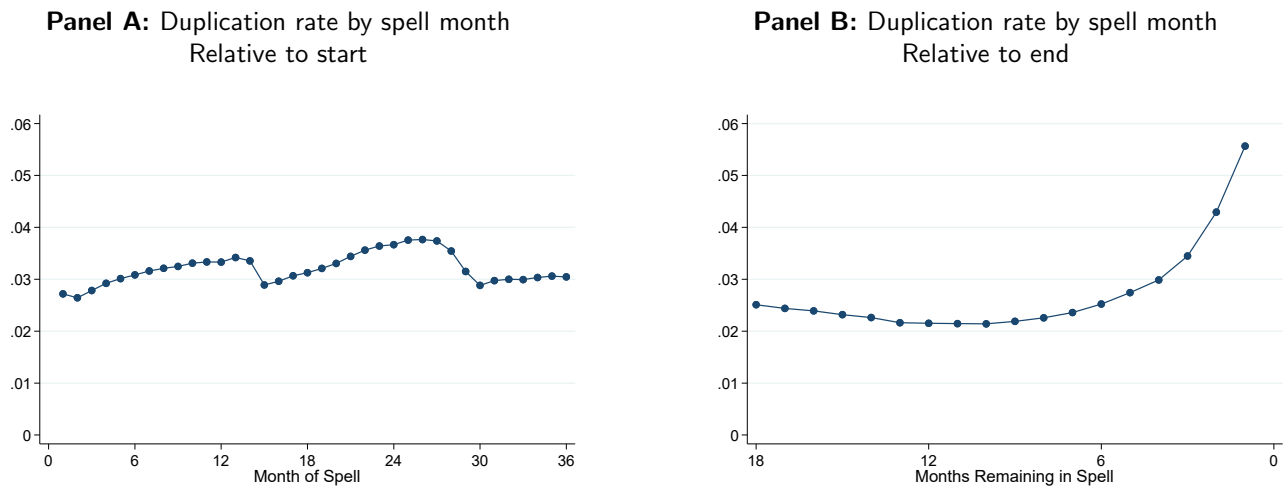
two reasons. First, Medicaid and CommCare used a singled unified eligibility and enrollment system, meaning that inappropriate duplicate coverage should not occur. Second, most Medicaid managed care plans also participate in CommCare, and we expect there may be some measurement error in labeling Medicaid vs. CommCare coverage. This would create the potential for false positives in measuring duplicate coverage. Because duplication seems administratively very unlikely and the potential for false positives, we exclude Medicaid coverage and focus on duplication between CommCare and private coverage. We do not have an external dataset to validate the enrollment numbers for private coverage, so we take the spell descriptors in the APCD at face-value. We define dual enrollment as a month in which a CommCare member is also enrolled in non-CommCare private health insurance.

D.2 Duplicate Coverage: Results

A limitation of the APCD data is that we are unable to distinguish member income levels or whether the member actively selected their plan at enrollment, meaning we cannot directly measure the duplication rate in the target auto-enrollment population. We present two lines of evidence: the first is that overall duplication within the CommCare marketplace is low, and follows patterns consistent with members gaining outside insurance leaving CommCare. The second examines the change in the duplication rate for CommCare enrollees entering before and after the suspension of auto-enrollment.

The average rate of duplication is low, around 3.1% of member-months in the APCD over the period 2009-2013. Figure A.12 examines the rate of duplication over the course of an enrollment

Figure A.12: Duplicate Coverage in CommCare over Enrollment Spells (2009-2013)



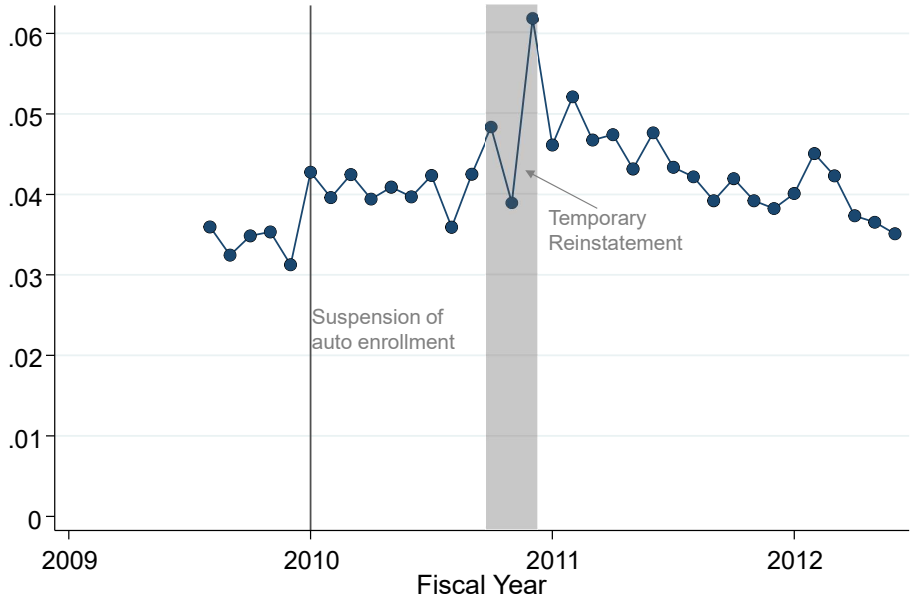
NOTE: The figures show the average rate of duplicate private insurance across all observed CommCare enrollment months in spells that begin in February 2009 and later, by the month of the spell (Panel A) and by the number of months remaining in the spell (Panel B). The APCD does not observe enrollment prior to January 2009, so month of spell is not known for spells that include January 2009.

spell. Duplication rates are lowest at the start of the spell and rise slightly over time. Interestingly, the probability of duplicate coverage drops in the 15th and again through the 27th-30th months of enrollment spells (Panel A), which is consistent with the timing of CommCare's re-certification of eligibility. This suggests that re-certification catches and disenrolls some members with outside insurance. Panel B shows the duplication rate in months relative to the end of a member's CommCare spell. The probability of duplicate coverage is highest in the 1-3 months before the member leaves CommCare. This is consistent with members leaving due to acquiring outside insurance and there being a short overlap in some cases. Nonetheless, duplication rates are never high: even in the final month of enrollment, they are below 6%.

Figure A.13 examines whether duplication rates change when the auto-enrollment policy changes at the start of 2010. The figure shows duplication rates over each enrollee's first 12 months in CommCare, with the x-axis being the enrollee's month of entering CommCare. The population entering CommCare before the suspension of auto-enrollment at the start of fiscal year 2010 contains both active and passive enrollees, while post-suspension enrollees consist entirely of active enrollees. Since we cannot observe income level in the APCD, these averages also include enrollees above poverty who are not affected by the policy. The fact that average duplication rates rise slightly immediately following the end of auto-enrollment suggest suggests that, if anything, passive enrollees are *less* likely to have duplicate coverage than the rest of the CommCare population.

The pattern of reverses when we focus on the effect of the temporary reinstatement of auto-enrollment in the final three months of fiscal year 2010. Overall duplication rates among incoming CommCare enrollees spikes during reinstatement to 5-6%, suggesting elevated rates of duplicate insurance among passive enrollees joining in this window. This stands in contrast to the evidence from the suspension of auto-enrollment at the start of 2010. There are two possible explanations for this

Figure A.13: Duplication Rate by Month of Entry into CommCare



NOTE: The figure plots the duplication rate over the first 12 months of the spell by month of spell start, beginning in February 2009. The APCD does not observe enrollment prior to January 2009, so month of spell start is not known for spells that include January 2009.

discrepancy. The first is that passive enrollees during the temporary reinstatement period were different because auto-enrollment worked differently. Rather than auto-enroll passive applicants after two weeks of non-response, the late-2010 auto-enrollment occurred for a stock of passive applicants who had applied throughout 2010 – possibly months beforehand. Alternatively, the spike may reflect a coincidence. The duplication rate stays elevated in early 2011 despite auto-enrollment not occurring, suggesting that other factors may be affecting the time trends.