Targeting Overuse of Home Health Care: Evidence from Multiple Policy Instruments

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Abstract

We study the impact of Medicare policies designed to reduce wasteful use of home health care. We examine three very different policy instruments: strike force prosecutions of suspected fraud, moratoria on the entry of new home health agencies, and caps on outlier payments received by home health agencies. Each substantially reduces home health care use; when applied to similar populations, each policies reduces home health care use by an average annual 20 to 30 percent for five years. However the instruments vary greatly in their administrative costs and in how well targeted they appear to be in reducing 'waste', with the least costly policy also the worst targeted. To consider how these policies would perform out-of-sample in other parts of the country, as well as the implications of combining them, we use causal forests to estimate heterogeneous treatment effects across individuals for each of the policies. We will use these results to consider counterfactual applications of these policies individually and in combination.

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1 Introduction

In high-income countries throughout the world, the aging of the population has brought with it a rapid growth in spending on formal long-term care, most of which is publicly-financed. This care can be provided either in an institution (typically, a nursing home), or in the patient's home, and there is substantial heterogeneity across countries in the relative prominence of these two forms of care; the share of total long-term care spending that is devoted to home health care ranges from under one-quarter in Spain to almost two-thirds in Japan; the United States occupies a middle ground at about two-fifths (Gruber et al. 2023b). Not unrelatedly, there is also substantial policy heterogeneity across countries in the coverage and reimbursement for each type of care, and public policy regarding long term care has been the subject of considerable policy debate and reform within many high-income countries over the last few decades (Gruber et al. 2023b).

The varied role that home health care plays in long-term care across countries, and the related heterogeneity in policy regarding reimbursement for home health care, reflects, at least in part, the uncertain position that home health care occupies, teetering on the boundary between medical care and a consumption good. This creates a fundamental tension for long-term care policy. On the one hand, the hope is that through the provision of relatively inexpensive services in the home, patients can be kept out of the much more expensive – and usually less preferred – care in a nursing home. Coverage of home health care thus offers the tantalizing prospect of simultaneously reducing health care spending and improving patient well-being. The concern, however, is that by subsidizing services that may be inherently appealing to many individuals, there is substantial scope for 'gray area' use of home health care by patients who would otherwise not have used facility-based care. This presents a two-sided targeting problem (Mountjoy 2022), in which policy design attempts to target patients who might be sufficiently healthy to be able to receive care at home rather than in a nursing home, but not so healthy that absent this option they would stay out of a nursing home altogether.

The U.S. Medicare program, which provides health insurance to the elderly and the disabled, has long struggled with precisely this tension. This was well-encapsulated by a recent government report (Medicare Payment Advisory Commission 2020):

> "Policymakers have long struggled to define the role of the home health benefit in Medicare... From the outset, there was a concern that setting a narrow policy could result in beneficiaries using other, more expensive services, while a policy that was too broad could lead to wasteful or ineffective use of the home health benefit."

In other words, the goal of Medicare home health care policy is to provide care for patients who would otherwise reside in nursing homes; the danger is that some or many of the patients receiving Medicare-covered home care would otherwise not consume any long-term care. If Medicare-financed home health care use is predominantly used by patients who would not otherwise have used

Medicare-financed nursing home care, this offers the possibility that Medicare could substantially or entirely reduce its spending on home health care - which was more than $20 billion per year in 2019 (Medicare Payment Advisory Commission 2021b)[1] without any offsetting adverse consequences for patient health or Medicare spending on other care. As Lee and Skinner (2021) put it 'While the promise of home health care services is great—to keep frail people out of the hospital or nursing home by supporting them in their house—so also is the potential for fraud and "gray area" use of visits with little value to health.' A central question therefore is how well-targeted Medicare home health care use is and, relatedly, whether this targeting can be improved through policy reform.

In pursuit of better targeting, Medicare has engaged in a series of home health care policy reforms over the last half century. As can be seen in Figure 1, these have been temporally associated with dramatic swings in the amount of Medicare-financed home health care use.[2] This time series suggests that, consistent with the central tension behind Medicare home health care policy, it can have a first-order impact on home health care utilization. Most recently, the first two decades of the 21st century witnessed a series of major policy efforts designed to crack down on the rapid rise of home health care use seen after 2000 (see Figure 1) and the related perception of substantial waste, fraud, and abuse in Medicare-financed home health care.

Perhaps surprisingly given the centrality of this issue to the design of home health care policy - and the continued flurry of policy reforms designed to try to better target Medicare home health care spending - we have little evidence to date on how well-targeted Medicare home health care is, or how well-targeted various policy reforms have been. The limited existing evidence from a bespoke experiment in the early 1980s and from a 1997-2000 Medicare payment reform suggests that Medicare-financed home health care use is not well-targeted, in that it does not substitute for nursing home care (Kemper 1988; McKnight 2006). However, these analyses pre-date the modern era of empirical analysis that offers the possibility of substantially increased statistical power through both uses of large-scale administrative data and attention to potentially important heterogeneity in treatment effects. Moreover, they study a time period in which Medicare policy toward home care was very different from today; even if these policies did not impact nursing home use, other policies - including multiple recent major policy reforms designed to rein in home health care use - could result in meaningful substitution to nursing home care.

We therefore explore the optimal design of Medicare home health care policy by studying three distinct Medicare home health care policies introduced between 2007 and 2016. Specifically, we study the introduction of: (i) Strike Forces designed to detect and prosecute home health care fraud; (ii) the introduction of a cap on the amount of outlier payments (for high spending patients) a home health agency could receive; (iii) moratoria on the entry of new home health agencies. The Strike Forces were created specifically to combat what was perceived to be substantial amounts of prosecutable fraud; the other policies were designed to combat perceptions of waste or over-use more

[1] All dollar amounts are reported in 2022 dollars, adjusted by the CPI-U.
[2] All references to Medicare refer to Traditional Medicare.

generally. The policy instruments vary widely in their design and, relatedly, their administrative costs, providing an opportunity to assess a range of possible types of interventions and to assess the relative efficacy of different instruments individually or in combination.

We exploit variation in the timing and spatial application of these policies to study - individually and collectively - their impacts on home health care use and nursing home use both on average and across patients. We use the universe of Medicare claims data for two decades (1999-2019) to analyze the impact of these policies. We also exploit the richness of the data to examine heterogeneous impacts across ex-ante natural categories of patients - such as their eligibility for Medicare-covered nursing home care - and to exploit recent advances in the use of causal forests to detect heterogeneous treatment effects (e.g., Athey et al. 2019).

We find substantial and sustained overall effects of each of these policies on home health care use. These effects appear immediately and, if anything, appear to be increasing throughout our 5-year post implementation study period. Looking at the average effects over their first five years, we find that - within the high use areas targeted by these policies - the Strike Forces and outlier payment cap reduced home health care use by about 30 percent, and the moratoria reduced home health care use by about 20 percent. Impacts on home health care payments per capita were similar in magnitude. The Strike Force and moratoria both reduced the share of Medicare enrollees who use home health care each year by about 10 percent, while the outlier cap had, not surprisingly, no impact on this extensive margin.

Yet despite similarly large impacts on home health care use, the policies differ in their administrative costs and also how well-targeted they are at reducing the kind of home health care use that is likely to be 'wasteful'. Our preliminary evidence suggests that the moratoria, which are relatively low cost, are the best targeted, while the outlier cap - which actually saves the government money - is the least well-targeted; the Strike Forces - which are extremely expensive (our back-of-the-envelope calculation suggests that each Strike Force spends about $120 million per year on home health care), lie somewhere in between these two extremes. However, we find no evidence that any of the policy-induced reductions in home health care use are associated with substitution to use of SNF, raising the possiblity that Medicare-financed home health care coverage could be pared back substantially without increasing use of nursing home care.

To explore this possibility more systematically, in the final part of the paper we consider potential counterfactual policies. One key question is what the impact of these policies would be if they were - counterfactually - applied to places where they have not yet been introduced. The Strike Forces, for example, are deliberately located in areas with high perceived amounts of prosecutable home health care fraud, raising questions of their likely out-of-sample impact. Another key question is whether the policies target similar or different patients, which has important implications for the reduction in home health care that could be achieved by combining them. At one extreme, if the policies impact very different types of patients or home health care use, combining them

might eliminate most home health care use. At the other extreme, if they function more or less as substitutes, the amount of home health care they could collectively reduce would be limited to about 30 percent. To address both types of questions, we therefore use causal forests to estimate heterogeneous treatment effects as a function of characteristics both of the home health agencies and their potential patients. We then use these estimates to consider counterfactual impacts of expanding individual policies nationwide, as well as combining various policies both nationwide or in particular areas.

Our paper contributes to a growing literature studying health care fraud. In the context of home health care, O'Malley et al. (2023) document the role of patient-sharing across home health agencies in contributing to the spread of home health care fraud in areas targeted by Strike Forces, and Kim and Norton (2015) study the impact of the outlier payment cap on home health care utilization. Looking beyond the home health care sector, recent papers have studied the impact of whistleblower filings against health care providers under the False Claims Act (Leder-Luis forthcoming; Howard and McCarthy 2021), the relative efficacy of ex-post anti-fraud litigation and ex-ante regulation for combatting fraudulent use of Medicare-financed ambulances as taxi services for patients' regular dialysis treatments (Eliason et al. 2021), and the use of revenue caps and anti-fraud litigation in reducing use of Medicare-financed hospice (Gruber et al. 2023a).

More broadly, our paper tackles a central pre-occupation of both the health economics literature and health policy: how to effectively combat the substantial waste in the U.S. health care system, with waste typically defined as medical spending that provides little or no benefit to patient health. Healthcare spending is one of the largest fiscal challenges facing the public sector in the United States, with health care spending accounting for almost one-fifth of the economy, and half of that spending taxpayer financed. There is widespread agreement that a large portion - perhaps one quarter or one-third - of healthcare spending is waste (Orszag 2009; McGinnis et al. 2013; Shrank et al. 2019), of which prosecutable fraud is only a small subset. The three main culprits for wasteful spending are generally viewed to be excessive administrative costs, high prices, and inappropriate medical care (Shrank et al. 2019). Yet there is little agreement on how design policies to reduce wasteful spending without reducing patient access to valuable care. In this paper we identify three such policies in the context of home health care, and consider how to optimally combine them.

The rest of the paper proceeds as follows. Section 2 describes our setting, including background information on home health care and the three policies we will study. Section 3 describes our data, sample and summary statistics. In Section 4 we introduce the econometric frameworks we will use to analyze each of the three policies, and illustrate them by presenting the estimated impacts on home health care use. Section 5 explores how well targeted each policy is, by considering the types of patients affected as well as the direct impacts of the policies on skilled-nursing facility (SNF) use; it also presents direct evidence of the substitution hypothesis by studying the relationship between SNF and home health use, using the policies as instruments for home health use. Section

6 will consider heterogeneity in the impact of these policies across home health agencies and patient types, and examines the performance of counterfactual combinations of policies. The final section concludes.

2 Setting

2.1 Long-term care in the U.S.

The share of the U.S. population that is 65 and older has risen dramatically over the last 20 years - from about 12 percent in 2000 to about 17 percent in 2019 - and with it the share of GDP spent on long term care has also risen, from about 1.1 percent in 2000 to about 1.3 percent in 2019. Spending on long-term care is likely to increase further as the population continues to age; the OECD projects that by 2060 about one-quarter of the U.S. population will be over 65 (Gruber and McGarry 2023).

Long-term care includes care in an institutional setting (typically a nursing home) and care received in the home by paid caregivers.[3] In 2019, institutional care accounted for about three-fifths of spending on paid long-term care, with home health care accounting for the remaining two-fifths. (Center for Medicare & Medicaid Services 2023b)

About two-thirds of long-term care in the U.S. is publicly financed. Medicare - the federal public health insurance program for the elderly and disabled - pays for a little over half of that care, while Medicaid - the joint federal-state public health insurance program for low income individuals - pays for the rest; Medicare pays for a slightly larger share of publicly financed home health care (about 60 percent) (Gruber and McGarry 2023). Importantly, Medicare coverage for long-term care is limited to individuals who need care following an acute illness and are expected to recover; it is not designed for patients who are expected to need on-going assistance. Medicaid, by contrast, will cover patients with chronic needs, including basic custodial help with activities of daily living.

Using data described below, we estimate that in 2019, 8.0% of Medicare beneficiaries (3.2 million) used Medicare-financed home health care services. The average patient receiving home health care had about 31 visits, spanning 1.9 60-day episodes. The average home health visit cost $177, and patients received 3 visits per week on average. There were 11,356 Medicare-approved home health agencies operating in the US, which translates to 3 agencies per 10,000 beneficiaries.

[3] It also includes informal, unpaid care received in the home, often provided by relatives. However, our focus is exclusively on paid care - either in a nursing home or at home. This type of care has direct fiscal consequences for public insurance programs, and is also substantially easier to measure. Nonetheless, the potential for informal care looms large in our analysis and in considerations of optimal policy design, as it represents a large potential margin of elasticity of paid home health care use.

2.2 Medicare coverage of home health

Medicare covers short-term nursing home stays for patients recovering from a surgical procedure or acute health event (such as a stroke). To be eligible for Medicare coverage, the nursing home stay must start within 30 days of the patient being discharged from the hospital after a hospitalization that lasted for at least three days (Center for Medicare & Medicaid Services 2022b). Medicare-covered home care, however, does not require a recent prior hospital stay. To qualify for home health care, a Medicare enrollee must have difficulty leaving the home without considerable effort and require part-time or intermittent skilled care; a health care provider must certify this need and re-certify it at least every 60 days. Medicare home health care encompasses a range of services delivered to patients in their homes to facilitate their recovery. This includes skilled nursing care, physical therapy, speech-language pathology services, occupational therapy, and home health aide services. Unlike most of Medicare-covered services, home health has no patient cost sharing, with the exception of a 20% coinsurance for any DME or biologics provided in connection to the home health visits (Center for Medicare & Medicaid Services 2022a, Center for Medicare & Medicaid Services 2023a).

As noted in Section 1, the explicit rationale of Medicare-financing for home health care is to reduce Medicare-financed nursing home use (or in principle other Medicare-financed care, of which nursing home use is the most natural margin of substitution). The potential savings are large; we estimate in our data that covering a patient for a week in a SNF costs Medicare over five times as much as covering them with home health care for the week.[4]

Somewhat surprisingly - both in light of this goal and given the natural possibility of such substitution - we have little evidence to date that Medicare home health care can reduce use of nursing home care. In the early 1980s, the channeling demonstration - a randomized controlled trial of the impact of providing more comprehensive case management and more coverage of community services on nursing home use - was explicitly designed by the Department of Health and Human Services to test this substitution hypothesis. Despite targeting an elderly and extremely frail population (the average age of the population served was 80, about 85 percent were restricted in their ability to perform activities of daily living and the remainder had multiple limitations to instrumental activities of daily living) and successfully increasing the amount of formal community services used, this 10-site, 6,000-person intervention did not substantively reduce nursing home use over the 12-18 month period of the study (Assistant Secretary for Planning and Evaluation 1991) One reason that has been conjectured is the relatively low rates of nursing home use during the follow up period in the control group (about 13 to 14 percent); relatedly, the one site where the intervention produced meaningful substitution had substantially higher rates of nursing home use of about 50 percent in the subsequent year (Kemper 1988).

[4] On average in our data a day in a SNF costs Medicare $360, and a home health care visit costs Medicare $143; on average a Medicare enrollee in home health care receives 3.3 visits per week.

About two decades later, the dramatic, 30 percent decline in home health care use from 1997 - 2000 (see Figure 1) associated with the introduction of the Medicare Interim Prospective Payment System (IPPS) provided another opportunity to test the substitution hypothesis. Using variation across states in the generosity of the interim prospective payment rates relative to the historical fee-for-service payment rates, McKnight (2006) documented a substantial reduction in home health care use associated with IPPS; yet she found no corresponding increase in nursing home use or other adverse health consequences. These results again suggest little role for Medicare-covered home health care in reducing nursing home use, but they also leave open the possibility raised in response to the Channeling results that there could be meaningful substitution among the set of patients at risk for high rates of nursing home use. Such effects could have been quantitatively important for Medicare spending yet hard to detect in the data available for that time period; McKnight (2006)'s analysis uses the 1992-1999 Medicare Beneficiary Survey data on about 100,000 individuals, about 15 percent of whom reported some home health care use.

2.3 Medicare home health policy reforms

Over the past several decades, the utilization of home health care has experienced significant fluctuations that coincided with changes in Medicare payment policies (see Figure 1). Home health utilization witnessed a steep increase immediately following a 1998 class action lawsuit (Duggan vs Bowen) which prompted the Department of Health and Human Services to issue a clarification that allowed patients to receive home health services for stable needs, rather than requiring the patient's condition to be improving (Liu et al. 1999). Between 1990 and 1996, Medicare home health spending increased from $4 billion to $17 billion, raising concerns among policy makers over high levels of spending (Liu et al. 2003), and prompting Congress to reform the home health payment system in the Balanced Budget Act of 1997, first introducing the Interim Payment System (IPS) and later the Home Health Prospective Payment System (HH PPS). Prior to the IPS, home health agencies were reimbursed for their costs up to a per-visit cap. The IPS lowered the per-visit cap and additionally introduced an agency-level annual per-patient cap. The result was a steep decline in the number of visits per home health patient from 78 in 1997 to 46 in 1999 and a reduction in the total number of home health patients from 3.3 to 2.5 million (McCall et al. 2001).

In October 2000, the prospective payment system that is in place to this day was introduced; home health care is prescribed in 60-day episodes, with the payment for the episode determined based on the patient's severity and geography (Medicare Payment Advisory Commission 2021b; Vontran and Gehne 2019); if a patient's care is exceptionally costly, the home health agency may receive an additional high-cost outlier payment on top of the regular payment (Medicare Payment Advisory Commission 2017). Following the implementation of PPS, utilization began to steadily increase throughout the 2000s (see Figure 1).

What followed were a series of efforts to reverse this increase in home health care use and that

are the focus of our study. In particular we study three specific policies designed to combat rising home health care use and perceptions of wide-spread fraud and overuse:[5]

Strike Forces

The most resource-intensive of such efforts were the Strike Forces, joint efforts between the Department of Justice (DOJ) and the Department of Health and Human Services Office of the Inspector General (HHS-OIG) designed to detect and prosecute home health care fraud. The use of Strike Forces in Medicare has not been limited to home health care; they have also been used to prosecute Medicare fraud in areas such as durable medical equipment, IV infusion therapy and, by the tail end of our study period, prescription opioids (Department of Health & Human Services & Department of Justice 2019). During our study period, home health comprised about half or more of the cases pursued by Strike Forces (Department of Justice 2013, Department of Justice 2016). To our knowledge, we present the first empirical academic study of the impact of these Strike Forces.

Fraud in home health has been a major concern of the regulatory agencies, prompted by the dramatic growth in home health care starting in the early 2000s (see Figure 1), and its concentration in particular regions. In 2008, the five highest spending core-based statistical areas made up 20% of total home health spending. One suspect area was in Miami-Dade, Florida, where home health spending per beneficiary quadrupled between 2002 and 2008. Another suspect area included five counties, all located in Texas, in which the number of home health episodes exceeded the number of Medicare enrollees (Medicare Payment Advisory Commission 2010b, Lee and Skinner 2021). Home health fraud can take different forms, but the majority of cases pursued by the OIG and the DOJ involve one or more of the following activities: billing for excessive and unnecessary care, providing care to ineligible patients, and billing for services that were never provided. (Department of Health & Human Services & Department of Justice 2010, Department of Health & Human Services & Department of Justice 2012).

The first Strike Force started in 2007 in the Southern District of Florida (which includes Miami), and over the next six years Strike Forces were launched in another nine federal judicial districts as part of the Heath Care Fraud Prevention and Enforcement Action Team (HEAT). The districts were chosen for Strike Forces based on where Medicare claims data revealed aberrant billing patterns or intelligence suggested potential fraud (Department of Health & Human Services & Department of Justice 2010, Department of Health & Human Services & Department of Justice 2011). Each

[5]Two other notable policies occurred during our study period, which ends in 2019. One was the pre-claims review requirement, first launched in August 1, 2016 in Illinois and suspended on April 1, 2017. Given the short time period it was in effect, we study the impact of the policy and discuss it briefly in Appendix B. The other policy was the introduction of a required face-to-face encounter between a physician and patient to document the patient's eligiblity for home care. This requirement was introduced in the second quarter of 2011 as part of the Affordable Care Act. According to a MedPAC report, the five states with the fastest-growing home health episode volume prior to 2011 experienced a 25 percent decline in volume between 2011 and 2019 (Medicare Payment Advisory Commission 2019). However, since the policy was introduced nationwide, it is difficult to isolate the causal impact of the face-to-face requirement from the myriad of concurrent changes.

Strike Force team brought together the investigative and analytic resources of multiple agencies in addition to the HHS and the DOJ, including the Federal Bureau of Investigation (FBI), the Defense Criminal Investigate Service (DCIS), the Federal Deposit Insurance Corporation Office of the Inspector General (FDIC-OIG), the Internal Revenue Services (IRS), among others. The DOJ Criminal Division's Fraud Section and the US Attorney's Offices (USAOs) brought forward cases in federal district courts (Department of Health & Human Services & Department of Justice 2010, Department of Health & Human Services & Department of Justice 2011). By the end of 2017, Strike Force teams operated in 10 districts across the U.S., and had filed over 2,400 cases against about 600 defendants for about $2 billion in losses (Office of the Inspector General 2018).[6] It is difficult to exactly identify the government costs of prosecuting home health care through Strike Forces - both for the usual reasons of separating fixed and variable costs and because of the aggregated nature of reported government spending; however, our rough back of the envelope calculation in Appendix A suggests that each Strike Force spends about $120 million per year on home health care.

Figure 2a shows where and when strike forces were created in different districts. Appendix Table OA.1 presents more specifics on the dates of entry.

Home health agency moratoria

HEAT also recommended moratoria on new home health agencies in particular counties where it felt that this was necessary for combating fraud (Center for Medicare & Medicaid Services 2013). Even though 99% of beneficiaries already lived in a zip code with a Medicare home health agency, the number of home health agencies continued to increase, with growth especially concentrated in the states of Texas, Florida, and Michigan. The rapid growth raised concerns over fraud and abuse (Medicare Payment Advisory Commission 2010a). Medicare introduced the first wave of moratoria in 2013 - right around the time of the last Strike Force that was introduced (in 2013 in the Eastern District of Louisiana) - in a variety of counties in Chicago, IL, Miami, FL, Houston, TX, Fort Lauderdale, FL, Detroit, MI, and Dallas, TX. In 2016, the moratoria expanded to include all counties in the states of Illinois, Texas, Florida, and Michigan (Center for Medicare & Medicaid Services 2016).

Figure 2b shows where and when home health agency moratoria were introduced in different counties. Appendix Table OA.2 presents more specifics on the dates of entry. Note too that there is a fair amount of overlap between where Strike Forces enter (Figure 2a) and moratoria (Figure 2b) enter. Specifically, we estimate that about 70 percent of Medicare-enrollee-weighted counties with a Strike Force received a moratorium, and vice versa, although as noted the moratoria came

[6] Additional Strike Force teams were opened in Newark, NJ and Philadelphia, PA in August 2018, and in Orlando in November, 2018. However, since our sample period ends in 2019, we chose not to include these areas in our analysis. Washington, DC and the Appalachian Region also joined the Strike Force in 2018, but unlike the ones we study, they focused on corporate fraud and prescription opioids, respectively, rather than home health care and we excluded them from our analysis (Department of Health & Human Services & Department of Justice 2019).

in after the Strike Forces. As a result, in the empirical analysis below we will analyze these two policies simultaneously.

Outlier payment caps

A national effort to reduce wasteful home health care spending was a 2010 reform that capped the outlier payments that home health agencies could receive. The policy, which was announced in 2009, stipulated that outlier payments could not make up more than 10% of total Medicare home health payments to the agency each year, above which the home health agencies would not receive further outlier payments. The reform was prompted by what Medicare described as "excessive growth in outlier payments in a few discrete areas of the country . . . where outlier payments to providers far exceed the national average and the 5 percent target for outlier payments . . . [and] the size of these statistical anomalies raised concerns about the medical necessity of the outlier episodes in some areas." (Medicare Payment Advisory Commission 2019). Since then, home health utilization has been on a steadily declining trajectory (see Figure 1). The effect of this outlier payment cap has been analyzed in prior literature: Kim and Norton (2015) exploits the variation in the proportion of outlier payments prior to the implementation of the cap to study how home health agencies adjusted the number of home health visits. The study finds a large reduction in the number of home health visits and that the effects are largest for relatively healthy patients.

Figure 2c shows the variation across U.S. counties in the share of home health care spending in 2009 that would have been above the agency cap that was introduced in 2010 and presents summary statistics.[7] Only about 7 percent of (enrollee-weighted) counties and 11 percent of (home health care episode-weighted) HHAs had outlier payments above the cap in 2009; conditional on being above the cap, however, the average outlier payment share was 18 percent and 30 percent for counties and HHAs respectively.

3 Data and Summary Statistics

Our primary data is a 20% random sample of Traditional Medicare beneficiaries between 1999 and 2019. We limit to beneficiary-years enrolled in Medicare Parts A and B throughout the entire year; among other things, this excludes beneficiary-years enrolled in Medicare Advantage for all or part of the year. We use data from the Master Beneficiary summary file, which contains information on patient demographics - including zip code of residence, race, and gender - and summary measures of annual health care utilization and spending by separate categories, including home health care, skilled nursing facilities (SNFs), and inpatient hospital admissions. We also use more granular data on home health care claims, including the start and end dates of each episode of care, the specific agency that provided the care, and value of outlier payments in each episode.

[7] We discuss the data behind this in more detail in the next section.

Our primary outcomes of interest are home health care and SNF use and spending at the county-year level. For each type of care, we analyze three different measures of utilziation, all on a per-capita basis:[8] an extensive margin measure of the share of patients who received any of that care that year, an intensive margin measure of the amount of care received (home health care visits or days in the SNF), and the amount of spending on that care.

We also find it useful to analyze these outcomes separately by several different measures of beneficiary type. First, we use the referral code variable in the home health care claims file to classify beneficiaries as either being 'from the community' (i.e. referred directly by a physician) or 'from the hospital' (the complement of that category, which includes patients admitted from any form of institutional care). We do this because beneficiaries coming from the community are both likely to be healthier and also, based on anecdotal description, more likely to be a source of fraudulent claims. This classification is only feasible for beneficiary-years with home health care claims.

Second, we take two approaches to classifying beneficiaries who are more vs. less likely to use a Medicare-covered SNF in the absence of home health care. We define home health care (or SNF) care as 'SNF qualifying' if the care starts being used by a patient within 30 days of their being discharged from an inpatient hospital stay that lasted at least three days. We also classify beneficiaries based on their predicted SNF use. Specifically, we predict the number of days in a SNF that each patient would have in a 'training sample' of patients between 2001 and 2004 living outside of areas that ultimately became Strike Force districts; we make these restrictions to generate a measure of predicted SNF use before the major increase in home health care use (see Figure 1) and the related concerns about fraud. We generate the prediction by running a patient-year regression of SNF covered days on age (linearly), sex and race indicators, indicators for 27 chronic conditions, and prior year's Medicare spending broken into 13 categories that together encompass all Medicare Part A and B spending except for home health and SNF; we use the resulting estimates to predict a level of SNF utilization for all patient-years in the sample.

Summary statistics

As seen in Figure 1, the share of individuals using home health care use is rapidly rising over the 2000 to 2009 period, and then experiences a pronounced downturn, coinciding with the introduction of the (national) 2010 outlier cap policy as well as the initial introduction of Strike Forces and home health agency moratoria. Rates of home health care visits and spending per enrollee exhibit similar patterns (Appendix Figure OA.1).[9]

The first panel of Table 1 displays (population weighted) county means for each of the home-

[8] More specifically, we analyze each outcome per 100 Traditional Medicare enrollees.

[9] Appendix Figure OA.2 shows that Medicare-covered SNF use also flattens out around a similar time. This appears to be due to the general decline in inpatient use around this time; unlike for home care, eligibility for Medicare coverage of SNF care requires a prior hospital stay.

health care outcomes in 2007, prior to the introduction of the policies. The next panel shows the growth rate of these outcomes from 2003-2007. The first column shows results for all counties. On average in 2007, about 9 percent of patients used home health care, with (unconditional) average annual visits per capita of 3.1 and spending per capita of $420. About three-quarters of these visits came from patients from the community. These rates represent a substantial growth over the 2003-2007 period in all three measures.

The remaining columns show these outcomes separately for counties affected by different policies. Not surprisingly - indeed reassuringly - these policies do not appear to be randomly assigned. Counties that had Strike Forces or moratoria or a larger impact of the outlier payment cap had both higher rates of home health care use in 2007 and higher rates of growth in use between 2003 and 2007 than counties that did not. We now turn to our empirical specifications which will take account of this non-random nature of the policy implementation.

4 Policy impacts on home health care use

In this section, we present our empirical frameworks for studying each of the three policies aimed at reducing home health care use and present their direct impacts on that home health care use. In subsequent sections we will use the same frameworks to study SNF substitution. A key feature that we will account for in our estimation approach is that, as discussed in the preceding section, many of these policies are - not surprisingly (and indeed, perhaps reassuringly) - not randomly assigned across the United States.

4.1 Strike Forces and Moratoria

As discussed, because of the considerable overlap in the geographic placement of moratoria and Strike Forces (recall Figure 2) we analyze their impact together, so that our estimates of the effect of one policy control for the effects of the other. Specifically, we use the following county-year event study specification:

$$y_{ct} = \alpha_c + \tau_t + \sum_r \beta_r SF_{d(c)} \times I_{r(d(c),t)} + \sum_{\tilde{r}} \theta_{\tilde{r}} M_c \times I_{\tilde{r}(c,t)} + \epsilon_{ct} \tag{1}$$

where y_{ct} denotes the outcome of interest in county c and year t, α_c denotes county fixed effects, and τ_t denotes calendar year fixed effects. $SF_{d(c)}$ is an indicator for whether a Strike Force office ever opened in the district county c belongs to, $d(c)$. $I_{r(d(c),t)}$ denotes indicators for the year relative to the opening of a Strike Force office in $d(c)$; these indicators are always zero for counties that never received a Strike Force. M_c is an indicator for whether county c was ever targeted by a moratorium, and $I_{\tilde{r}(c,t)}$ denotes fixed effects for the year relative to the start of an HHA entry moratorium in county c; again these indicators are always zero if the county never was targeted

by a moratorium. For both sets of relative year indicators we omit relative year -1 (the year prior to entry), and we include 'catch all' indicators for relative years -6 and earlier or relative years 6 and later. We weight each county-year by its 2006 (Traditional) Medicare enrollees, and cluster the standard errors at the district level; there are 89 districts in our analysis.

As shown in Table 1, home health care use was growing more rapidly in the treatment counties prior to the Strike Force and moratoria. To account for this, we assume that the outcome variable would have continued to grow logarithmically in the absence of each of these policies. Formally, this means that we fit the equation

$$y_c t = \alpha_c + \tau_t + \sum_{r \notin \{-5,-4,-3,-2,-1\}} \beta_r SF_{d(c)} \times I_{r(d(c),t)} + \gamma \log\left(R_{cr(d(c),t)} + 7\right) + \sum_{\tilde{r} \notin \{-5,-4,-3,-2,-1\}} \theta_{\tilde{r}} M_c \times I_{\tilde{r}(c,t)} + \phi \log\left(\tilde{R}_{c\tilde{r}(c,t)} + 7\right) + \epsilon_{ct} \quad (2)$$

where $R_{cr(d(c),t)}$ is a continuous variable taking the values of the year relative to the opening of a Strike Force office in county c and year t (this equals zero in all years for non-Strike Force areas), and $\tilde{R}_{c\tilde{r}(c,t)}$ is defined analogously for the moratorium relative years; all other variables are defined the same way as in equation (1) and the weighting and treatment of standard errors is also the same. Now, β_r will now represent the effect of the Strike Force relative to a logarithmic trend in the outcome variable fitted in the five years prior to a Strike Force office opening. Likewise, $\theta_{\tilde{r}}$ now represents the effect of the moratoria relative to a logarithmic trend in the outcome variable fitted in the five years prior to a moratorium on HHA entry. Note that $R_{cr(d(c),t)}$ and $\tilde{R}_{c\tilde{r}(c,t)}$ are shifted by 7 when entering the logarithm so that their logs are never undefined (the earliest relative year in the data is -6).

We analyze three main dependent variables at the county level: the log share of enrollees with home health care visits, the log number of home health care visits per capita, and the log home health care spending per capita.[10]

Strike Force estimates

Figure 3 shows the estimated impacts of the Strike Force for all three outcomes. The solid line in each figure corresponds to the estimates of β_r from estimating equation (1). These estimates show a pronounced decline in all three measures of home health care use after the Strike Force office opens. This decline begins immediately; it is visible even in the year of Strike Force entry (relative year 0), grows substantially in year 1, and continues to grow over the five year period examined.

[10] All are actually per 100 capita and we add one to the home health care measures to avoid taking logs of zeros. In practice this affects less than 0.06% of the population-weighted county-years. And we show in robustness analysis below that the results are extremeley similar if we instead estimate a Poisson specification for the home health care measures, as recommended by Chen and Roth (forthcoming)

The estimates also indicate that prior to the opening of a Strike Force office, areas where a Strike Force office subsequently opened were experiencing rising home health care use relative to other areas where a Strike Force office either didn't open or opened later. As discussed, this is not surprising from a policy perspective – rapidly rising home health care use after 2000 was part of what prompted concerns about home health care fraud (Medicare Payment Advisory Commission 2015, 2021a), and we would expect that Strike Force offices would open first in the areas where such fraud was considered most likely to be occurring at large scale.

Nonetheless, this suggests that the estimated impact of the Strike Force based on the estimates of β_r from estimating equation (1) in Figure 3 will under-estimate the impact of the Strike Force because they fail to account for the fact that absent that intervention, home health care use would have likely continued to grow in those areas. The dashed line in Figure 3 visualizes the fitted trend by plotting $y = \gamma \log(R + 7)$ from equation (2), normalized to pass through $(-1, 0)$. As a result, the effect of the Strike Force as measured by the estimates of β_r in equation (2) is approximately the distance between the dashed and solid lines. Table 2 summarizes these results. Specifically, for each of the three home health care outcomes, the top row of each panel summarizes the estimated average impact of the strike force in its year of entry, its first three years, and its first five years. These are based on linear combinations of the various estimates of β_r in equation (2).

The results indicate that overall, home health utilization declined substantially as a result of Strike Force activity. For example, in Figure 3 panel (a) we estimate that, even without accounting for the fact that home health care visits would likely have increased in the absence of the Strike Force, home health visits per capita decreased by about 15 percent on average in the five years after the Strike Force operations began. This effect increases to 27.6 percent (standard error = 6.2) once we account for the pre-existing rising trend in visits (Table 2). Medicare home health care payments per capita declined by a similar amount (21.2 percent, standard error = 5.8). Interestingly, the effects of the Strike Force on the extensive margin—the share of patients in each county using home health care—are much more modest. Even after adjusting for trends in the pre-period, we estimate that Strike Force offices decreased the share of patients receiving home health care by a statistically insignificant 7.0 percent (standard error = 4.2) on average in the five years following a Strike Force opening. This provides a preliminary indication that the impacts of the Strike Force may not have been well-targeted.

Moratoria impacts

Figure 4 shows the estimated impacts of the moratoria for the same three outcomes. The solid lines in each figure now correspond to the estimates of $\theta_{\tilde{r}}$ in equation (1), while the dashed line visualizes the fitted trend by plotting $y = \phi \log(\tilde{R}+7)$ from equation (2), normalized to pass through $(-1, 0)$.

For each outcome, our estimates of $\theta_{\tilde{r}}$ for $\tilde{r} < 0$ are small and statistically indistinguishable

from zero and, correspondingly, the fitted pre-trend line is essentially flat.[11] Our estimates of $\theta_{\tilde{r}}$ for $\theta_{\tilde{r}} > 0$ indicate that the moratoria reduced home health care utilization on both the intensive and extensive margins. Table 2 indicates that on average in their first five years, the moratoria decreased the number of home health care visits per capita by about 17.3 percent (standard error = 6.9) and decreased home health care spending per capita by 20.4 percent (standard error = 5.1). These effects are similar in magnitude to the Strike Force effects but whereas the Strike Force had no discernible effect on the extensive margin—the share of patients using home health—the moratoria on entry of new home health agencies had a significant effect on the share of patients receiving home health care; on average over its first five years, a moratorium decreased the share of patients using home health by a statistically significant 13.7 percent (standard error = 2.7).

4.2 Outlier payment cap policy

The outlier payment cap was imposed on the entire country in 2010. However, we can measure the policy's impact by comparing counties where outlier payments were more or less common prior to the policy change, and hence more or less affected. Specifically, for each HHA j in the data, we define s_j to be the percentage of HHA j's total payments that came from outlier payments in 2009, the year before the cap was implemented. Then for each county c, we define s_c be a weighted average of s_j for all HHAs serving patients in county c, where the weights are the share of home health episodes received by patients in county c in 2009 that were provided by HHA j. Figure 2c showed the resulting geographic variation in s_c.

We estimate the following equation:

$$y_{ct} = \alpha_c + \tau_t + \sum_r \beta_r s_c \times I_{r(t)} + \epsilon_{ct} \tag{3}$$

where α_c represents county fixed effects, τ_t represents calendar year fixed effects, and $I_{r(t)}$ represents indicators for each year relative to the beginning of the outlier payment cap (this is equivalent to τ_t, since all counties were treated in 2010). These are interacted with s_c as defined above. We again weight each county-year by the 2006 Medicare enrollee population, and we cluster standard errors on the county.

We also once again make the assumption that home health care use increases logarithmically over time, in proportion to the county-level outlier payment share and fit the equation

$$y_{ct} = \alpha_c + \tau_t + \sum_{r \notin \{-5,-4,-3,-2,-1\}} \beta_r s_c \times I_{r(t)} + \gamma \log(R_t + 7)\, s_c + \epsilon_{ct} \tag{4}$$

where R_t is a continuous variable taking the values of the year relative to the beginning of the

[11] As noted in Section 2.3, Moratoria came in starting in 2013, after the Strike Forces, so any parametric 'pre-trend' in home health care use prior to the moratoria will be partly absorbed by the Strike Force post-intervention relative year dummies.

outlier cap; all other variables are defined the same way as in equation (3). In other words, β_r will now represent the effect of the outlier cap relative to a logarithmic trend in the outcome variable fitted in the five years prior to the cap's implementation. Note that R_t is shifted by 7 when entering the logarithm so that its log is never undefined (the earliest relative year in the data is -6).

The solid lines in Figure 5 plot the fitted values of β_r in equation (3) for the three main home health care outcomes. As with the Strike Force event study, we see pronounced pretrends. The dashed line in Figure 5 visualizes the fitted trend by plotting $y = \gamma \log(R + 7)$, normalized to pass through $(-1, 0)$. As a result, the effect of the outlier cap as measured by the specification in equation (4) is approximately the distance between the dashed and solid lines. Table 2 once again displays the average event study coefficients relative to trend in the one, three, and five years after the policy is implemented.

As with the Strike Force and moratoria, the outlier cap had a large, negative impact on home health care utilization. The point estimates show the impact of a one percentage point increase in the outlier payment share. For example, they indicate that five years after implementation, a 1 percentage point higher outlier payment share is associated with a statistically significantly 3.3 percent (standard error = 0.4 percent) decline in home health care visits per capita. To put that in context, the average outlier payment share in home health agencies in Strike Force counties was 8.8 percent. The estimates therefore suggest that compared to not having the outlier payment cap in these counties, its presence reduced home health care visits per capita by about 29 percent, roughly the same as the Strike Force did. Also like the Strike Force (and unlike the home health agency moratoria) it had no discernable effect on the share of patients using home health care. We estimate that on average in the five years after implementation, it reduced the share of Medicare enrollees using home health care by a statistically insignificant 0.1 (standard error = 0.2) percent. This is not surprising given the nature of the policy which was aimed at reducing spending among high-spending patients rather than use among lower spending or marginal patients.

5 Policy Targeting

If the goal of Medicare-financed home health care is to use home health care as a substitute for patients who would otherwise be in more expensive (and presumably lower utility) nursing homes, a policy's 'targeting' can be measured by its relative impacts on home health care use by patients at greater or lower risk of SNF use, or directly by its impacts on SNF use. We explore how well targeted each of the policies is on both of these measures.

5.1 Types of patients whose home health care use is affected

Medicare's stated aim covering home health care is to reduce the use of expensive (and presumably less desirable) nursing home (SNF) care. We therefore consider a policy to be better targeted if the

reductions in home health care it induces come more from patients who are not likely to use SNF care in the absence of home health care. We consider two measures of targeting. First, we look at impacts of each policy separately for patients that come to home health care from the community (and therefore are at low risk of Medicare-covered SNF use) or from the hospital (who are at higher risk); recall from Table 1 that about 80 percent of home health care visits are from patients who come from the community, and that this share is even higher in areas that were impacts by the policies we study. By this measure, a better targeted policy is one that has a more concentrated effect on reducing care from patients coming from the community. Second, we look at impacts separately for home health care use from patients that would be potentially eligible for Medicare SNF coverage because the home care use is by a patient within 30 days of their being discharged from an inpatient hospital stay that lasted at least three days; about 30 percent of home health care use is 'SNF qualifying' by this definition. By this measure, a better targeted policy is one that has a more concentrated effect on reducing non-SNF qualifying care.

Figures 6 and 7 show the results for home health care by patient origin (from the community or not) and for home health care that is SNF qualifying or not, respectively; Tables 3 and 4 summarize them. By either measure, the moratorium appears to be the best targeted, with all of the reductions in home health care use concentrated among patients who come from the community or are not SNF qualifying. Likewise, the outlier cap policy appears to be the worst targeted by either measure; it has roughy proportional impacts on the use of home health care by patient origin, and roughly double the impact on non-SNF qualifying care compared to SNF qualifying care, but by both measures it is less well-targeted than the Strike Force, which also reduces both types of care but more disproportionately reduces care by patients from the community or that is non-SNF qualifying.

5.2 Impacts of policies on SNF use

We also directly analyze the impact of the three policies on SNF use. Figures 8 and 9 show the impact of each of the three policies on Medicare-covered SNF days and the share of enrollees having any SNF-covered days respectively; Table 5 summarizes these estimates. There is no evidence that the substantial - 20 to 30 percent average five-year - reduction in home health care use induced by the strike force, moratoria, or outlier payment cap produced a statistically significant substitution toward increased SNF use; indeed the point estimates for the moratoria suggest that the moratoria on home health agency entry is associated with a statistically significant decline in SNF use.

Estimated substitution elasticities

To more systematically investigate whether the substantial, policy-induced declines in home health care use we estimated are associated with any offsetting substitution toward SNFs, we use the policy-induced declines in home health care use as instruments in a second stage examination of

the relationship between SNF use and home health care use. We use all three policies we can examine in the same framework - i.e. Strike Forces, moratoria and outlier payment caps - as instruments. Because the proportional functional form we have been using seems appropriate for the first stage relationship between policies and home health care use, we estimate a non-linear IV model where the first stage is a Poisson regression:

$$h_{ct} = \exp(\alpha_c + \tau_t + \sum_{r \notin \{-5,-4,-3,-2,-1\}} \beta_r SF_{d(c)} \times I_{r(d(c),t)} + \gamma \log\left(R_{cr(d(c),t)} + 7\right) + \sum_{\tilde{r} \notin \{-5,-4,-3,-2,-1\}} \theta_{\tilde{r}} M_c \times I_{\tilde{r}(c,t)} + \phi \log\left(\tilde{R}_{c\tilde{r}(c,t)} + 7\right) + \sum_{\bar{r} \notin \{-5,-4,-3,-2,-1\}} \beta_{\bar{r}} b_c \times I_{\bar{r}(t)} + \psi \log(\bar{R}_t + 7) b_c) \quad (5)$$

where h_{ct} denotes a measure of per-capita home health utilization, and α_c and τ_t denote county and year fixed effects, respectively. As in Section 4, $SF_{d(c)}$ is an indicator for whether the district county c is located in is ever targeted by a Strike Force, while $I_{r(d(c),t)}$ denotes a set of indicators for the year relative to the entry of a Strike Force office in district $d(c)$. M_c denotes an indicator for whether county c was ever targeted by a moratorium on HHA entry, and $I_{\tilde{r}(c,t)}$ denotes a set of indicators for the years relative to the beginning of a moratorium in county c. Finally, b_c denotes our measure of the "bite" of the outlier cap in county c, while $I_{\bar{r}(t)}$ denotes a set of indicators for the years relative to the beginning of the outlier cap. To account for increasing home health utilization in the areas targeted by each of these policies, we control for logarithmic trends in the years relative to the beginning of all three policies.

We then use the predicted values from estimating equation (5) (denoted by $\hat{h}_{ct}$) in a second stage regression of the relationship between SNF use and home health care use:

$$s_{ct} = \alpha_c + \tau_t + \rho \hat{h}_{ct} + \gamma \log\left(R_{cr(d(c),t)} + 7\right) + \phi \log\left(\tilde{R}_{c\tilde{r}(c,t)} + 7\right) + \psi \log(\bar{R}_t + 7) b_c + \epsilon_{ct} \quad (6)$$

where s_{ct} is a measure of per-capita SNF utilization, and we bootstrap the standard errors with 100 repetitions of the block bootstrap (i.e. resampling all county-years in 89 randomly selected districts with replacement). We also report results from a linear first stage relationship, which has the advantage of being identified solely off the instruments - rather than also the non-linear funtional form - but at the potential cost of a weaker first stage relationship.

Table 6 displays the results of our substitution analysis separately for the relationship between home health visits and SNF days (panel A) and home health spending and SNF spending (panel B). Overall we find no evidence that reductions in home health care use produce a substitution

toward SNF use.

The first column of Table 6 displays estimates of ρ from equation 6 for the full sample. Using either a days or a payments measure of utilization, the OLS shows a positive and statistically significant association at the county-year level between home health care use and SNF use; this might of course reflect the fact that a less healthy population is likely to use more of both types of care. Consistent with this type of upward bias to the OLS, the IV relationship is smaller, however it is never statistically significant and rather than negative point estimates which would be suggestive of substitution, the point estimates tend to be positive. They are also quite small. For example, the IV Poisson model in Panel A column 1 indicates that one additional home health care visit increases SNF days by a statistically insignificant 0.004 days (standard error = 0.015); the 95 percent confidence interval allows us to rule out a decline in SNF days of more than 0.025 days.

In columns (2) and (3) we try to detect substitution between home health care use and SNF use by narrowing in on subsets of the population for whom home health care use might be more likely to subsititute for SNF use. Column (2) limits our analysis to the top five percent of the population with the highest predicted use of SNFs; recall that only about 5 percent of Medicare enrollees use a SNF in a given year, compared to almost 10 percent of patients using home health care. Column (3) limits our first stage analysis to the approximately one-third of home health care use that is SNF-qualifying (i.e. occurs within 30 days of an inpatient stay lasting at least 3 days). The IV analyses now indicate a negative relationship between SNF use and home health care use, but are never statistically significant.

Finally, because the reduced form evidence in Figure 8 which suggests that the Strike Force and outlier payment caps show the most potential for substitution, we also show results in which we use only these two policies as instruments for home health care use, and include the moratorium variables ($\sum_{\tilde{r} \notin \{-5,-4,-3,-2,-1\}} \theta_{\tilde{r}} M_c \times I_{\tilde{r}(c,t)}$) in the second stage relationship between SNF use and home health care use in equation (6). Specifically, in columns (4)-(6) of Table 6, we report estimates of ρ in the alternative second stage equation:

$$s_{ct} = \alpha_c + \tau_t + \rho \hat{h}_{ct} + \gamma \log\left(R_{cr(d(c),t)} + 7\right) + \sum_{\tilde{r} \notin \{-5,-4,-3,-2,-1\}} \theta_{\tilde{r}} M_c \times I_{\tilde{r}(c,t)} + \phi \log\left(\tilde{R}_{c\tilde{r}(c,t)} + 7\right) + \psi \log(\bar{R}_t + 7) b_c + \epsilon_{ct} \quad (7)$$

where controlling for the moratorium fixed effects in the second stage isolates variation induced from the Strike Force and outlier cap. Once again we see no evidence of substitution from home health care use to SNF use.

6 Heterogeneous treatment effects and counterfactual analysis

In this section, we expand our analysis to consider two types of counterfactual policies. First, we consider the impact of applying the Strike Forces or moratoria out of sample in areas that did not receive them. Second, we consider counterfactual combinations of the three policies.

We examine potential heterogeneity along characteristics of patients as well as characteristics of the home health agencies they would likely go to; the latter seems particularly important to take into account given that all three policies were targeted at home health agencies. To define the relevant home health agencies for each patient, we take the weighted average of home health agencies that were used by any patient in their zip code in 2006, with the weights corresponding to each home health agency's market share of home health care episodes . The characteristics of home health agencies we consider are the year that they were founded, the share of their patients that come from the community, their growth in patients served between 2004 and 2009, and whether they are for profit, non profit, or government-owned. We also consider the patient's prior year Medicare spending and whether they have each of 27 different comorbidities.

We apply the causal forest framework of Athey et al. (2019) to assess heterogeneous treatment effects of each of the policies. [Results to be added]

7 Conclusion

[Conclusion to be added]

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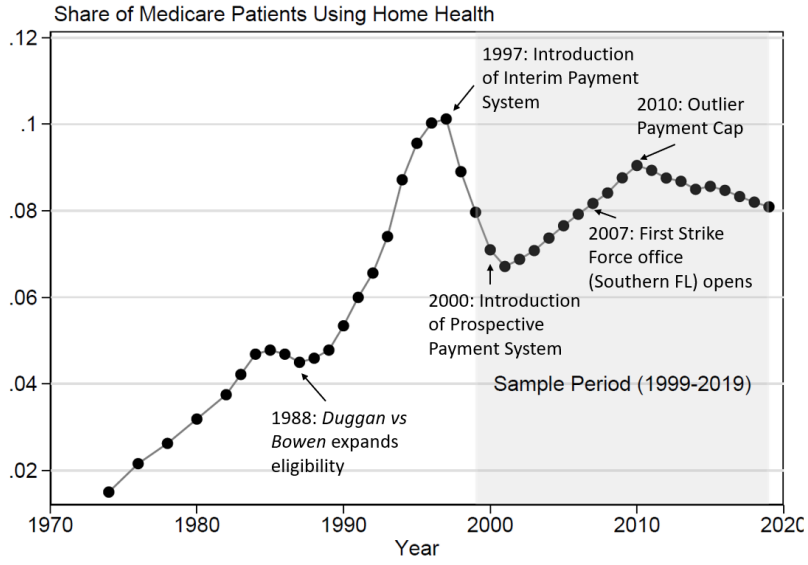
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Figures

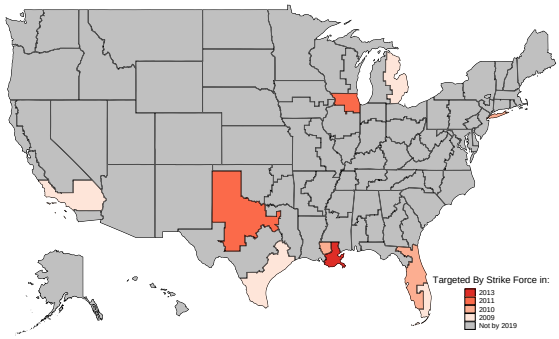
Figure 1: Share of Medicare Patients Receiving Home Health Care, 1974-2019



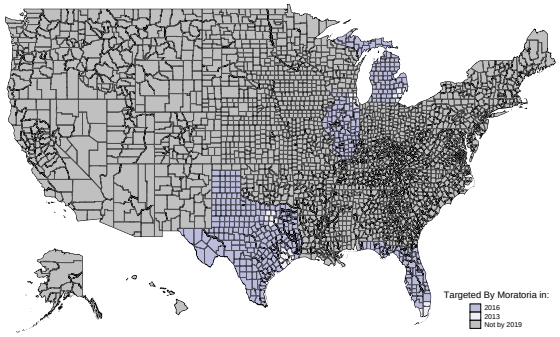
Notes: This figure displays trends in the share of Medicare enrollees receiving Medicare-financed home health care each year between 1974 and 2019. Data for 1974 through 1998 is from the CMS 2001 Statistical Supplement, while data for 1999 and beyond is from the 20% sample of Medicare claims data.

Figure 2: Geographic Variation in Policy Instruments

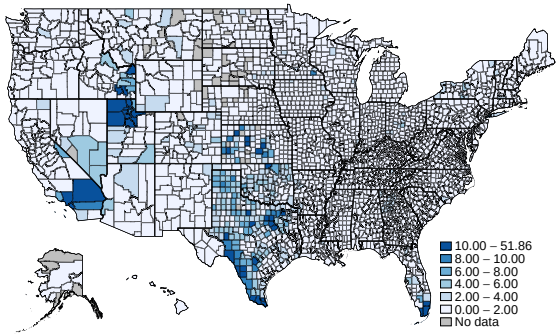
(a) Districts With Strike Force Offices



(b) Counties With Moratoria on HHA Entry



(c) Distribution of Outlier Payment Shares

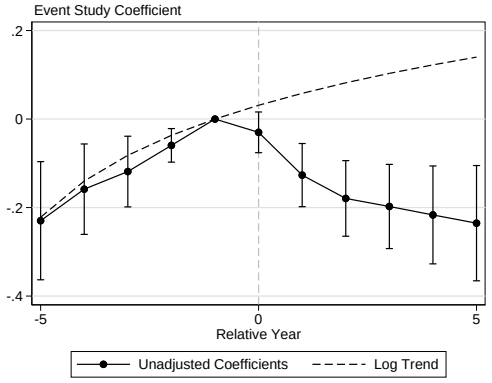


						Above 10%		Strike Force
Across:	10th	25th	50th	75th	90th	Share	Mean	Mean
Counties (Unweighted)	0.05	0.13	0.34	0.87	2.56	0.014	15.8	3.4
Counties (Weighted)	0.10	0.20	0.46	1.57	5.57	0.066	18.3	6.3
HHAs (Weighted)	0.00	0.02	0.19	1.23	10.86	0.107	30.5	8.8

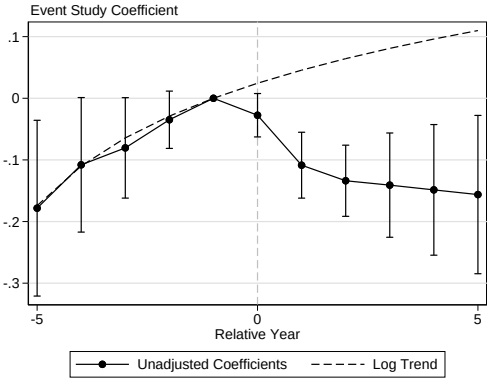
Notes: Panel (a) maps judicial districts in the United States, highlighting those with Strike Force offices operating by 2015. The legend gives the opening date of the office in each district; more recent openings have darker shades. Panel (b) maps counties in the United States, highlighting those that had moratoria on home health agency entry. The legend gives start year of the moratorium in each county. Panel (c) maps the percentage of payments that were outlier payments in 2009 across counties and provides summary statistics for these shares at the HHA and county levels. To aggregate the outlier payment share from the HHA level to the county level, we averaged the outlier payment shares for each HHA serving patients in each county, weighting by the share of home health episodes in the county that each HHA was responsible for. The distribution across counties is weighted by the number of Traditional Medicare enrollees living there in 2006, while the distribution across HHAs is weighted by the number of episodes provided by that HHA in 2009. The sample size is 3,256 counties and 10,229 HHAs.

Figure 3: Strike Force Effects on Log Home Health Care Utilization

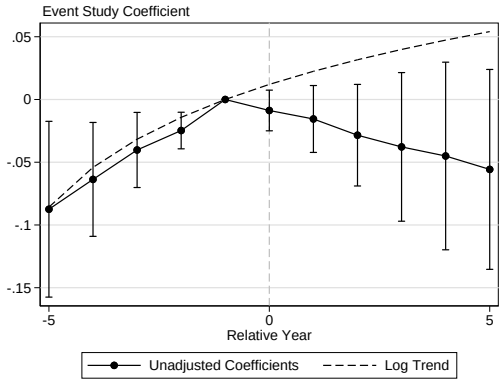
(a) Home Health Visits Per 100



(b) Home Health Payments Per 100



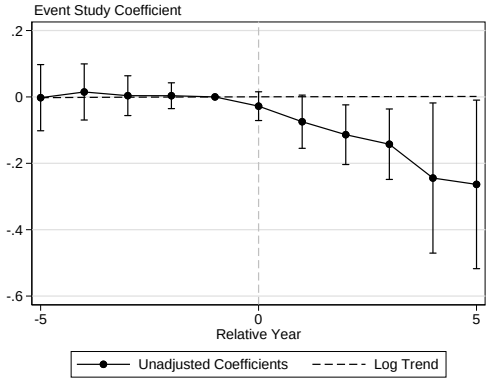
(c) Enrollees Using Home Health Per 100



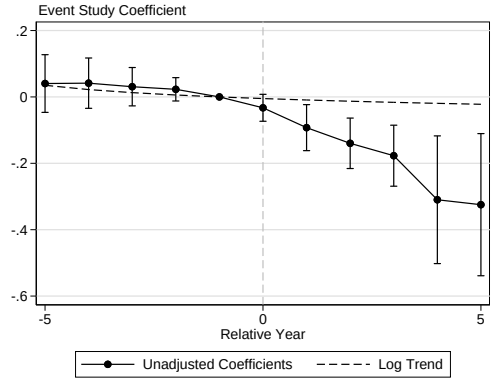
Notes: this figure shows event study estimates of β_r in equation 1 with several measures of per capita home health utilization as the outcome. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006. Vertical lines denote 95% confidence intervals computed using standard errors clustered at the district level. The dashed line represents the logarithmic trend in the outcome variable fitted according to equation **??**. The sample size is 63,552 county-years.

Figure 4: Moratorium Effects on Log Home Health Care Utilization

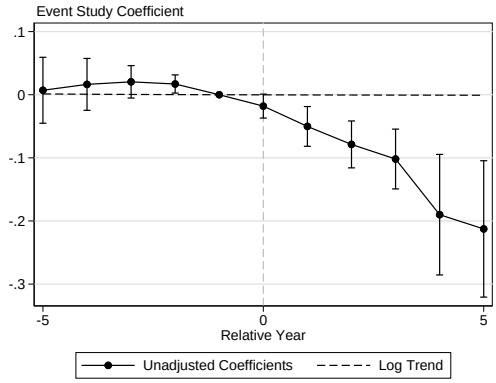
(a) Home Health Visits Per 100



(b) Home Health Payments Per 100



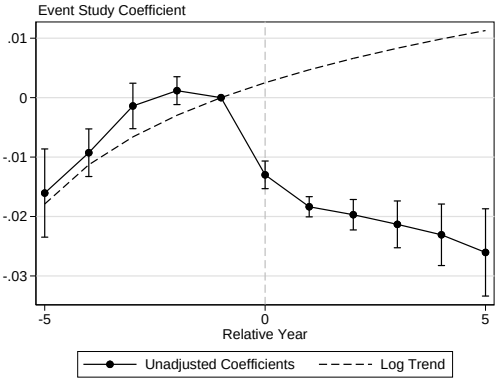
(c) Enrollees Using Home Health Per 100



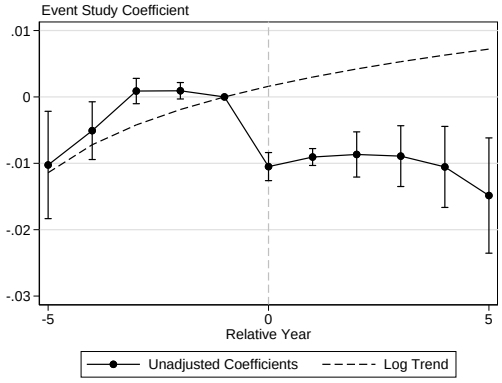
Notes: this figure shows event study estimates of $\theta_{\tilde{r}}$ in equation 1 with several measures of per capita home health utilization as the outcome. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006. Vertical lines denote 95% confidence intervals computed using standard errors clustered at the district level. The sample size is 63,552 county-years.

Figure 5: Outlier Payment Cap Effects on Log Home Health Care Utilization

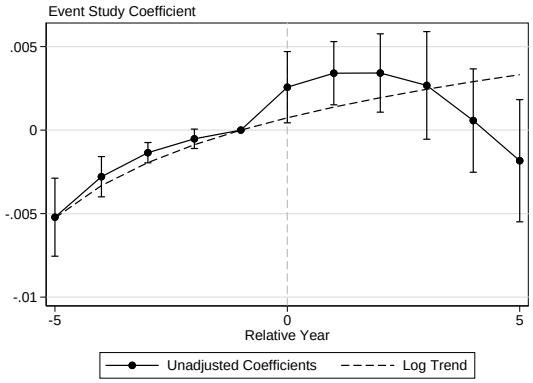
(a) Home Health Visits Per 100



(b) Home Health Payments Per 100



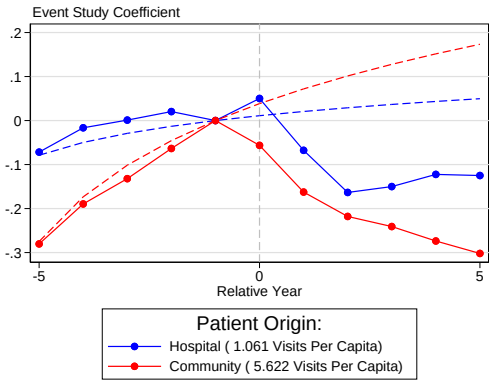
(c) Enrollees Using Home Health Per 100



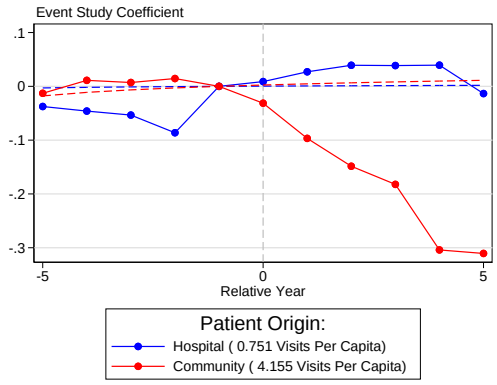
Notes: this figure shows event study estimates of β_r in equation 3 with several measures of per capita home health utilization as the outcome. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006. Vertical lines denote 95% confidence intervals computed using standard errors clustered at the county level. The dashed line represents the logarithmic trend in the outcome variable fitted according to equation 4. The sample size is 63,552 county-years.

Figure 6: Impact of Policies on Log Home Health Visits by Patient Origin

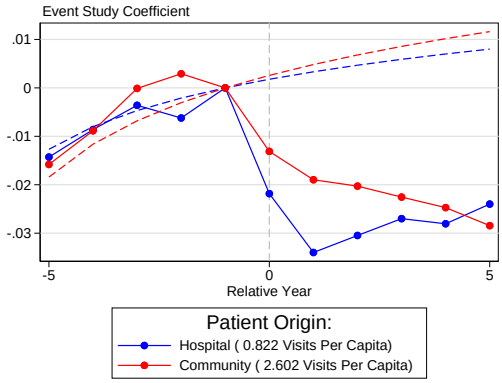
(a) Strike Force



(b) Moratorium



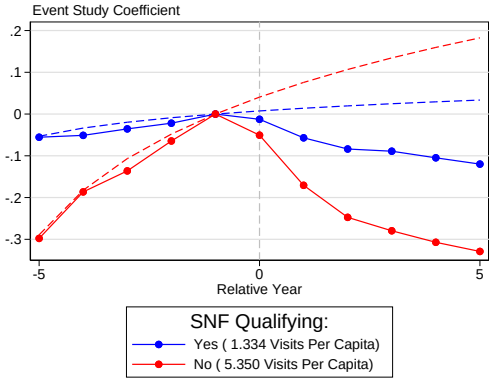
(c) Outlier Cap



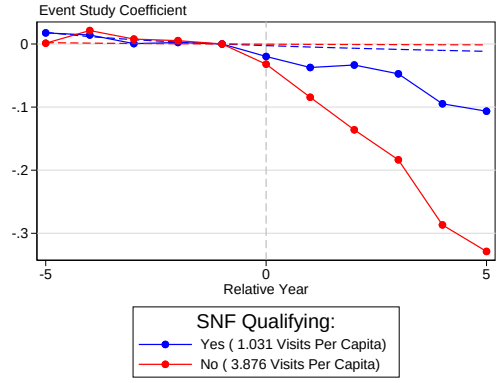
Notes: This figure displays event study estimates of the effects of each policy on home health visits per capita, separately for patients referred to HHAs from the community and from the hospital. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006.

Figure 7: Impact of Policies on Log Home Health Visits by SNF Qualifying Status

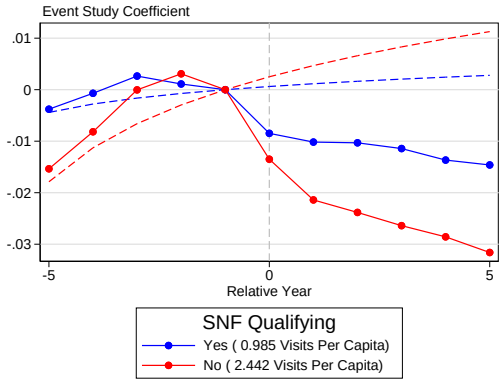
(a) Strike Force



(b) Moratorium



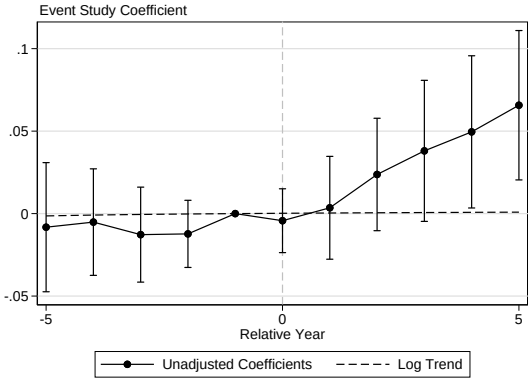
(c) Outlier Cap



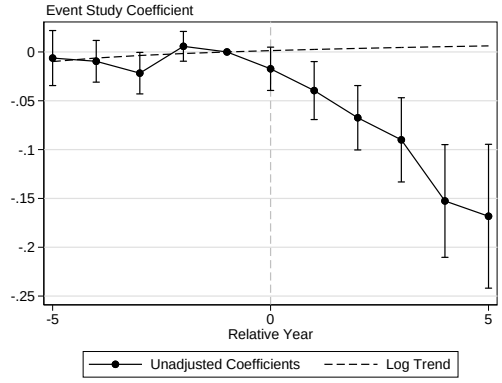
Notes: This figure displays event study estimates of the effects of each policy on home health visits per capita, separately for utilization occurring during episodes starting within 30 days of a discharge from an inpatient hospital stay lasting at least 3 days ("SNF qualifying") and otherwise. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006.

Figure 8: Impact of Policies on Log SNF Covered Days

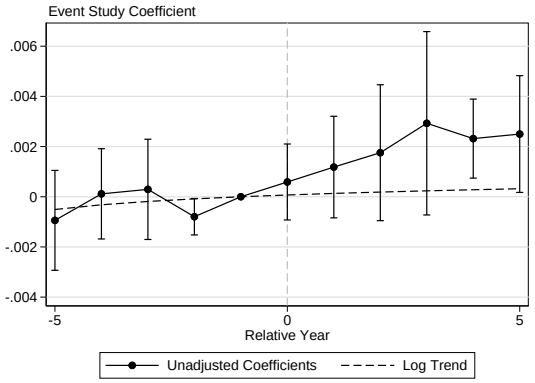
(a) Strike Force



(b) Moratorium



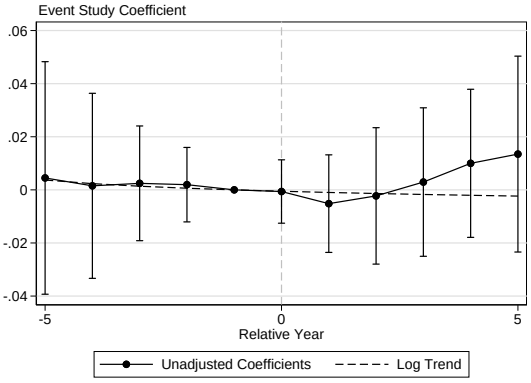
(c) Outlier Cap



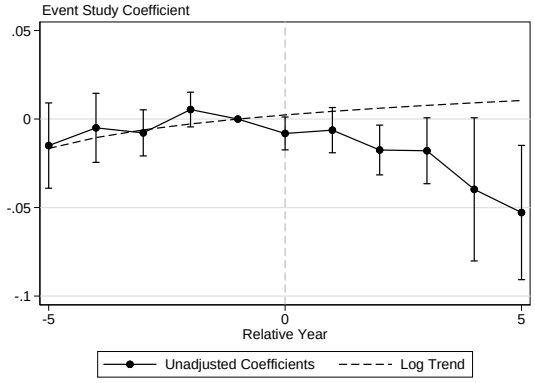
Notes: This figure displays event study estimates of the effects of each policy on log SNF covered days per 100 enrollees. Vertical lines denote 95% confidence intervals constructed using standard errors clustered at the district (Strike Force and moratorium) or county (outlier cap) level. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006.

Figure 9: Impact of Policies on Log Share of Enrollees Using SNFs

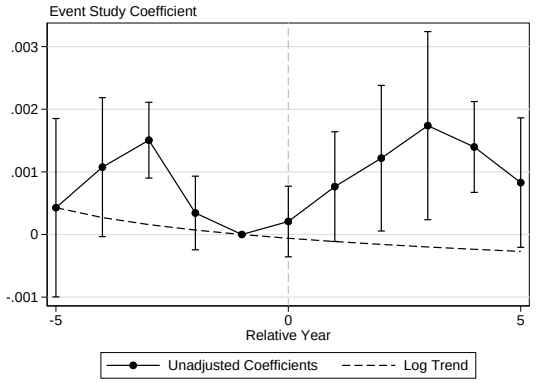
(a) Strike Force



(b) Moratorium



(c) Outlier Cap



Notes: This figure displays event study estimates of the effects of each policy on the log share of Medicare enrollees using SNFs. Vertical lines denote 95% confidence intervals constructed using standard errors clustered at the district (Strike Force and moratorium) or county (outlier cap) level. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006.

Tables

Table 1: Summary Statistics

	All	Strike Force		Moratorium		Outlier Payment Share	
		Yes	No	Yes	No	Above Median	Below Median
	Panel A: Home Health Utilization						
County Average (2007)							
HH Visits Per Capita	3.08	5.76	2.27	5.69	2.31	3.63	2.17
From the Hospital	0.76	1.13	0.65	1.04	0.68	0.83	0.64
From the Community	2.32	4.64	1.62	4.65	1.63	2.80	1.52
HH Payments Per Capita	$419	$738	$322	$725	$328	$465	$342
Share of Patients Using HH	0.093	0.131	0.082	0.130	0.083	0.097	0.087
Average Change (2003-2007)							
HH Visits Per Capita	0.85	2.64	0.31	2.92	0.24	1.19	0.30
From the Hospital	0.13	0.31	0.07	0.30	0.08	0.17	0.05
From the Community	0.73	2.34	0.24	2.62	0.17	1.02	0.25
HH Payments Per Capita	$147	$349	$86	$382	$77	$176	$99
Share of Patients Using HH	0.014	0.030	0.009	0.036	0.008	0.015	0.012
	Panel B: SNF Utilization						
County Average (2007)							
SNF Covered Days Per Capita	2.01	2.20	1.95	2.24	1.94	2.03	1.97
SNF Payments Per Capita	$652	$752	$622	$721	$632	$672	$619
Share of Patients Using SNFs	0.051	0.052	0.050	0.053	0.050	0.051	0.050
Average Change (2003-2007)							
SNF Covered Days Per Capita	0.33	0.40	0.30	0.47	0.28	0.33	0.32
SNF Payments Per Capita	$223	$264	$211	$275	$208	$230	$213
Share of Patients Using SNFs	0.004	0.006	0.004	0.007	0.004	0.004	0.004
Number of Counties	3,177	273	2,904	506	2,671	1,594	1,583

Notes: This table displays average measures of home health utilization (Panel A) and SNF utilization (Panel B) across various counties as defined by each column title. Averages are weighted by each county's Traditional Medicare enrollees in 2007.

Table 2: Effect of Policies on Utilization of Home Health Care

	Average of Relative Period Coefficients:		
	1	1-3	1-5
Panel A: Log Home Health Visits Per Capita			
Strike Force	-0.168	-0.232	-0.276
	(0.041)	(0.052)	(0.062)
Moratorium	-0.080	-0.116	-0.173
	(0.043)	(0.045)	(0.069)
Outlier Cap	-0.026	-0.029	-0.033
	(0.002)	(0.003)	(0.004)
Panel B: Log Home Health Payments Per Capita			
Strike Force	-0.151	-0.186	-0.212
	(0.031)	(0.043)	(0.058)
Moratorium	-0.095	-0.135	-0.204
	(0.032)	(0.032)	(0.051)
Outlier Cap	-0.014	-0.015	-0.018
	(0.002)	(0.004)	(0.005)
Panel C: Log Share of Enrollees Using Home Health			
Strike Force	-0.034	-0.052	-0.070
	(0.020)	(0.032)	(0.042)
Moratorium	-0.061	-0.088	-0.137
	(0.014)	(0.016)	(0.027)
Outlier Cap	0.002	0.001	-0.001
	(0.001)	(0.001)	(0.002)

Notes: This table displays several averages of post-period coefficients assessing the impact of each policy on several measures of home health utilization: the β_rs from equation (2) for the Strike Force, the $\theta_{\tilde{r}}$s from equation (2) for the moratorium, and the β_rs from equation (4) for the outlier cap. Standard errors clustered at the district (Strike Force and moratorium) or county (outlier cap) level are displayed in parentheses below each estimate. The sample size is 3,177 counties.

Table 3: Effect of Policies on Home Health Visits by Patient Origin

		Average of Relative Period Coefficients:		
	Patient Origin	1	1-3	1-5
Strike Force	Hospital	-0.103	-0.177	-0.182
		(0.080)	(0.088)	(0.089)
	Community	-0.222	-0.293	-0.351
		(0.049)	(0.063)	(0.075)
Moratorium	Hospital	0.069	0.076	0.067
		(0.063)	(0.078)	(0.096)
	Community	-0.113	-0.160	-0.228
		(0.047)	(0.047)	(0.071)
Outlier Cap	Hospital	-0.036	-0.034	-0.033
		(0.003)	(0.005)	(0.006)
	Community	-0.027	-0.031	-0.035
		(0.002)	(0.003)	(0.004)

Notes: This table displays several averages of post-period coefficients assessing the impact of each policy on log home health visits per capita from the hospital and from the community: the β_rs from equation (2) for the Strike Force, the θ_rs from equation (2) for the moratorium, and the β_rs from equation (4) for the outlier cap. Standard errors clustered at the district (Strike Force and moratorium) or county (outlier cap) level are displayed in parentheses below each estimate. The sample size is 3,177 counties.

Table 4: Effect of Policies on Home Health Visits by SNF Qualifying Usage

		Average of Relative Period Coefficients:		
	SNF Qualifying	1	1-3	1-5
Strike Force	Yes	-0.061	-0.087	-0.106
		(0.027)	(0.029)	(0.032)
	No	-0.235	-0.326	-0.387
		(0.045)	(0.061)	(0.074)
Moratorium	Yes	-0.031	-0.032	-0.055
		(0.023)	(0.025)	(0.037)
	No	-0.089	-0.139	-0.208
		(0.050)	(0.053)	(0.086)
Outlier Cap	Yes	-0.013	-0.014	-0.016
		(0.002)	(0.003)	(0.002)
	No	-0.030	-0.034	-0.038
		(0.002)	(0.003)	(0.004)

Notes: This table displays several averages of post-period coefficients assessing the impact of each policy on log home health visits per capita occurring as part of episodes starting within 30 days of a discharge from an inpatient stay of at least 3 days ("SNF qualifying") or otherwise: the β_rs from equation (2) for the Strike Force, the $\theta_{\tilde{r}}$s from equation (2) for the moratorium, and the β_rs from equation (4) for the outlier cap. Standard errors clustered at the district (Strike Force and moratorium) or county (outlier cap) level are displayed in parentheses below each estimate. The sample size is 3,177 counties.

Table 5: Effect of Policies on SNF Utilization

	Average of Relative Period Coefficients:		
	1	1-3	1-5
Panel A: Log SNF Covered Days			
Strike Force	0.012	0.028	0.043
	(0.020)	(0.025)	(0.027)
Moratorium	-0.040	-0.067	-0.106
	(0.013)	(0.016)	(0.020)
Outlier Cap	0.001	0.002	0.002
	(0.001)	(0.002)	(0.002)
Panel B: Log Share of Enrollees Using SNFs			
Strike Force	-0.005	-0.001	0.005
	(0.009)	(0.013)	(0.014)
Moratorium	-0.013	-0.023	-0.037
	(0.008)	(0.008)	(0.009)
Outlier Cap	0.000	0.001	0.001
	(0.001)	(0.001)	(0.001)

Notes: This table displays several averages of post-period coefficients assessing the impact of each policy on several measures of SNF utilization: the β_rs from equation (2) for the Strike Force, the $\theta_{\tilde{r}}$s from equation (2) for the moratorium, and the β_rs from equation (4) for the outlier cap. Standard errors clustered at the district (Strike Force and moratorium) or county (outlier cap) level are displayed in parentheses below each estimate. The sample size is 3,177 counties.

Table 6: IV Estimates of HH to SNF Substitution

	Strike Force, Moratoria, and Outlier Cap			Strike Force and Outlier Cap		
	All Patients	High Predicted SNF Use	SNF Qualifiers	All Patients	High Predicted SNF Use	SNF Qualifiers
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Effect of HH Visits Per Capita on SNF Covered Days Per Capita						
OLS	0.0120	-0.0085	-0.1053	0.0093	-0.0082	-0.1128
	(0.0060)	(0.0075)	(0.0358)	(0.0055)	(0.0079)	(0.0337)
IV (Poisson)	0.0039	-0.0230	-0.0773	-0.0007	-0.0231	-0.1033
	(0.0146)	(0.0468)	(0.1334)	(0.0156)	(0.0549)	(0.1348)
IV (Linear)	0.0006	-0.0383	-0.0833	-0.0069	-0.0402	-0.1278
	(0.0095)	(0.0341)	(0.1526)	(0.0123)	(0.0383)	(0.1686)
F-S F Statistic	282.6	84.7	47.4	168.8	16.3	27.5
Panel B: Effect of HH Payments Per Capita on SNF Payments Per Capita						
OLS	0.0770	0.0735	-0.3406	0.0652	0.0823	-0.3538
	(0.0341)	(0.0545)	(0.1718)	(0.0354)	(0.0568)	(0.1729)
IV (Poisson)	0.0467	-0.1259	-0.6213	0.0113	-0.1107	-0.6859
	(0.0799)	(0.1985)	(0.4992)	(0.0919)	(0.2263)	(0.5135)
IV (Linear)	-0.0179	-0.4410	-1.5547	-0.1054	-0.5405	-2.2082
	(0.0820)	(0.3694)	(1.5826)	(0.1425)	(0.5127)	(2.0126)
F-S F Statistic	252.9	67.2	83.2	178.6	46.4	70.1
N	63,270	62,608	63,168	63,270	62,608	63,168

Notes: This table displays estimates of ρ in equation 6 (columns 1-3) and 7 (columns 4-6). The outcome and independent variables are given by the titles of each panel. Standard errors clustered at the district level are displayed in parentheses; they are computed via the block bootstrap with 100 repetitions (sampling at the district level) for the Poisson IV specification and analytically for the other specifications. For the IV estimates, the independent variable is instrumented using the first stage equation (5), estimated using either Poisson or linear regression as denoted by the row title. All regressions are weighted by the number of Traditional Medicare enrollees in each county in 2006.

Appendices

A Strike Force Costs

As a collaborative effort between multiple branches of the U.S. government, the Medicare Fraud Strike Force is quite expensive to maintain, but there is no readily available report of exactly how costly a Strike Force is.

Each year, the U.S. Department of Health and Human Services (HHS) and Department of Justice (DOJ) publish a report with updates on the "Health Care Fraud and Abuse Control Program" (HCFAC). This program includes all of the HHS and DOJ's joint efforts to combat health care fraud, including the Strike Force. Each report lists spending at a national level, as well as descriptions of each initiative under HCFAC.

Appendix Table OA.3 provides an example of how funding to HCFAC is reported each year. The spending is itemized under divisions of each department, but there is no finer data on how much was allocated to each specific initiative.

To determine what spending is "relevant" to the Medicare Fraud Strike Force, we use the following quote from the 2009 report:

"Each Medicare Strike Force combines data analysis capabilities of CMS and the investigative resources of the FBI and the HHS/OIG with the prosecutorial resources of the DOJ Criminal Division, Fraud Section and the U.S. Attorneys' Offices."

Based on this quote, we define relevant spending to be the sum of spending under the following categories:

1. HHS Office of Inspector General
2. HHS Centers for Medicare and Medicaid Services
3. DOJ United States Attorneys
4. DOJ Criminal Division
5. DOJ Federal Bureau of Investigation

For each of these categories, we sum both mandatory and discretionary funding. Note that the FBI is not always listed as a category in the HCFAC reports (for example, it is not listed in Appendix Table OA.3. We interpret this to mean that the FBI received zero funding in these years.

Appendix Figure OA.4a displays the amount of "relevant" spending in each year between 1997 and 2020. With the exception of 2014-2015, relevant spending grows very slowly over time in years without new Strike Force openings. Under a "common trends" assumption in which the relevant spending level would have remained constant if a new Strike Force office did not open, we can impute how much Strike Force offices cost to operate by computing differences in relevant spending across years. For example, the difference between relevant spending in 2007 and relevant spending in 2006 would yield the approximate cost of operating the Strike Force office in Southern Florida, which opened in March 2007. We plot these differences in Appendix Figure OA.4b and map them to cost estimates of Strike Force offices in Appendix Table OA.4.

Since we do not consider the Strike Force offices in New Jersey and Eastern Pennsylvania as part of our analysis, summing the costs of the remaining Strike Force offices results in an estimate of

$332.2 million to operate each year. Note, however, that the Strike Force combats more than home health fraud; they also investigate and prosecute cases of fraud in Durable Medical Equipment, IV infusion therapy, and other areas. To obtain an estimate of how much the government spends in Strike Force operations to combat home health fraud only, we utilize the DOJ's Justice News website, which contains a database of press releases related to DOJ prosecutions. Specifically, for every year between 2009 and 2019, we search the website for the keywords "home health HEAT" and "HEAT" only. In total there were 364 press releases on home health and HEAT and 1,025 total press releases about HEAT. In other words, we estimate that roughly 35.5% of Strike Force spending, or $118.0 million per year is dedicated to home health.

B Pre-claims review

A final policy we are able to study is a requirement for pre-claim authorization; specifically, a requirement that CMS review and approve patients for eligibility for home health prior to the agency receiving any payments. Key components of the program included requirements for home health agencies to submit documentation from a provider proving that the beneficiary receiving home health met the coverage standards when filing an initial request for payment. If an HHA failed to provide documentation, payments would be reduced by 25% (Medicare Payment Advisory Commission 2017, Medicare Payment Advisory Commission 2019).

This was first launched on August 1, 2016 in Illinois. The program was initially designed to expand to other states, including Florida, Massachusetts, and Michigan, but the program was suspended after eight months, on April 1, 2017 before it could expand.[12] A Government Accountability Office report finds that home health payments decreased by about $100 million during the months the program was in effect. The reduction came from both the reduced payments to agencies that failed to provide documentation, as well as from agencies that stopped providing care to patients who were either marginally or totally ineligible for Medicare home health benefits. (Medicare Payment Advisory Commission 2019).

To study the pre-claims review requirement that was in place in Illinois from August 1, 2016 through March 31, 2017, we analyze a county-month panel from August 2015 through August 2017 (i.e. a one-year window before and after the policy). We estimate:

$$y_{ct} = \alpha_c + \tau_t + \sum_r \beta_r P_{s(c)} \times I_{r(t)} + \epsilon_{ct} \tag{8}$$

where α_c and τ_t denote county and calendar month fixed effects respectively. Here, $P_{s(c)}$ is an indicator for whether county c is located in the treated state (Illinois) and $I_{r(t)}$ represents indicators for the month relative to the implementation of the pre-claims review (i.e. August 2016). The regressions are weighted by the number of Medicare enrollees in each county in 2016 and standard errors are clustered at the county level.

Appendix Figure OA.3 shows that the pre-claims review also had an immediate and substantial impact on home health care use. Moreover, although the policy was only in effect for 10 months,

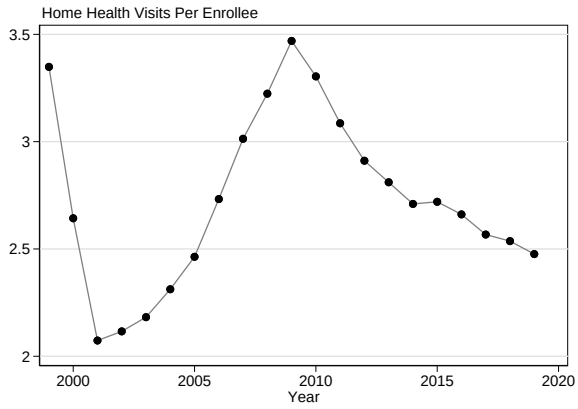
[12] A similar program – the Review Choice Demonstration – was announced in 2018 for implementation in Illinois, Ohio, Texas, Florida, and North Carolina in June 2019, September 2019, March 2019, September 2021, and September 2021, respectively. However, the rollout for Texas, Florida, and North Carolina were significantly disrupted by the COVID-19 pandemic and the entire Review Choice Demonstration program was paused on March 30, 2020 (Medicare Payment Advisory Commission 2019).

it indicates that the reduction in home health care use persists through the end of our analysis (approximately 5 months after the policy ended). The magnitudes are not directly comparable to the others, since we only look at the first 10 months (rather than 5 years) of the policy; still the results suggest a statistically significant decline in home health care visits per capita of about 10 percent, and about a 5 percent decline in the share of enrollees using home health care.

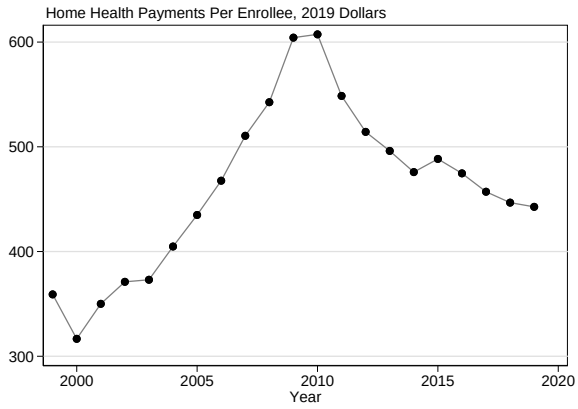
C Appendix Figures

Figure OA.1: Trends in HH Utilization, 1999-2019

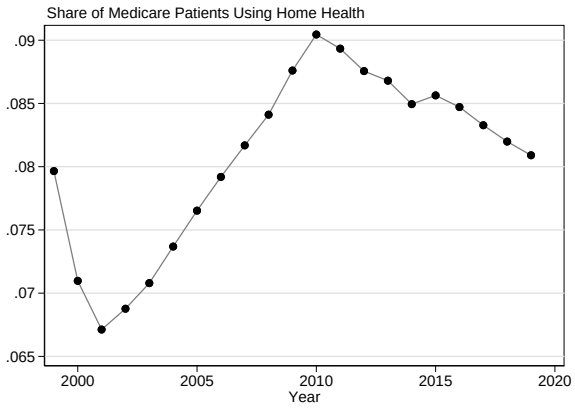
(a) Home Health Visits



(b) Home Health Payments



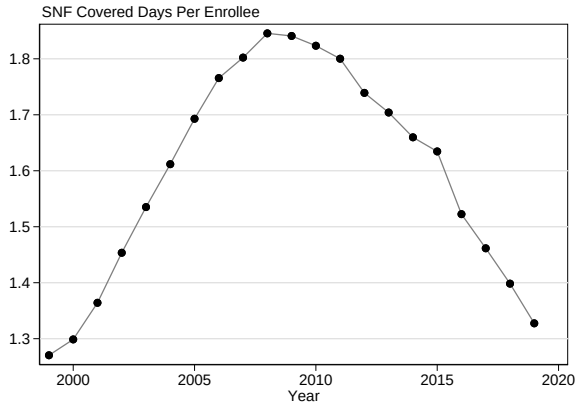
(c) Share of Patients Using Home Health



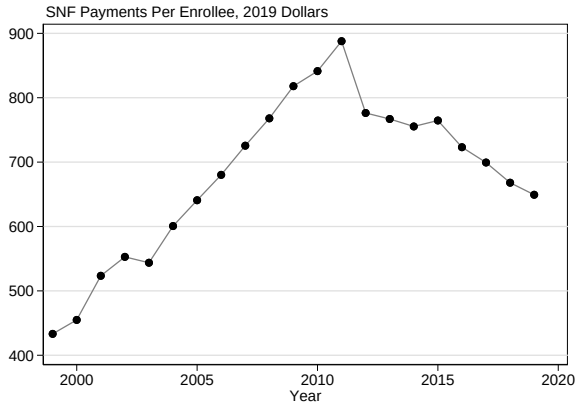
Notes: This figure displays the average level of home health utilization across the United States between 1999 and 2019 as measured by home health visits (Panel a), home health payments (Panel b), and the share of patients using home health (Panel c). The sample consists of all patients enrolled in Traditional Medicare for all 12 months of the year in the 20% claims files.

Figure OA.2: Trends in SNF Utilization, 1999-2019

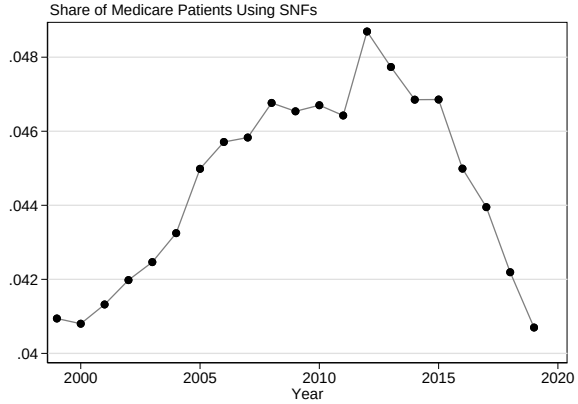
(a) SNF Covered Days



(b) SNF Payments



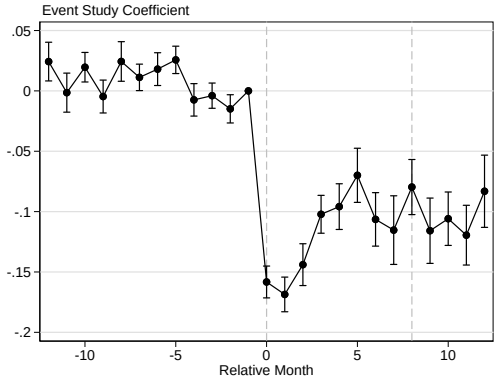
(c) Share of Patients Using SNFs



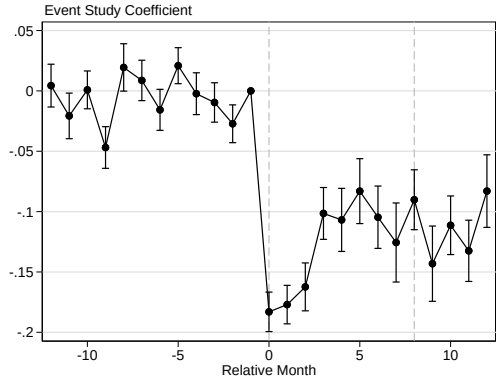
Notes: This figure displays the average level of SNF utilization across the United States between 1999 and 2019 as measured by SNF covered days (Panel a), SNF payments (Panel b), and the share of patients using SNFs (Panel c). The sample consists of all patients enrolled in Traditional Medicare for all 12 months of the year in the 20% claims files.

Figure OA.3: Pre-Claims Review Effects on Log Home Health Care Utilization

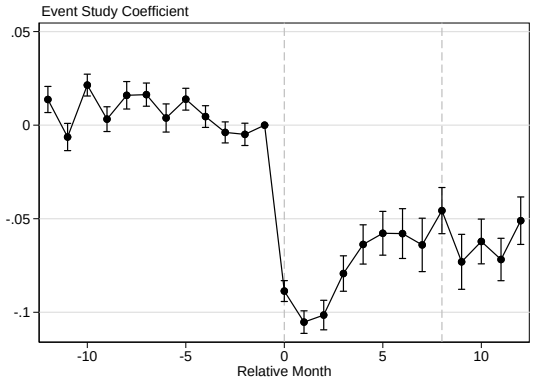
(a) Home Health Visits Per 100



(b) Home Health Payments Per 100



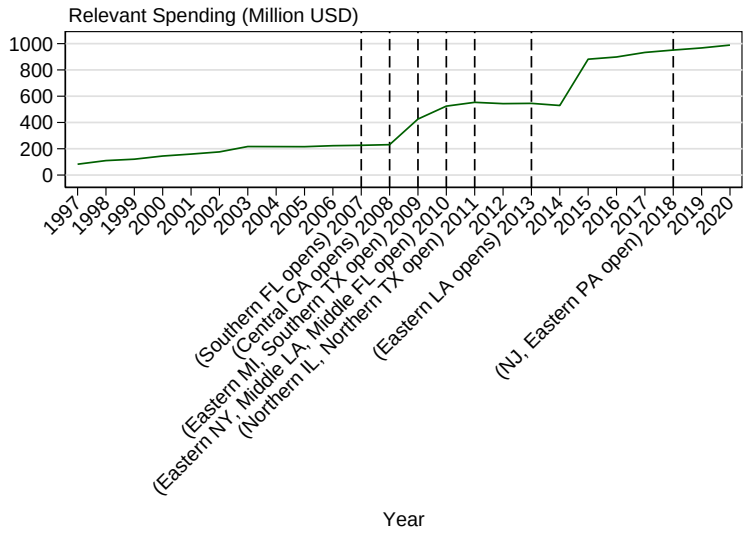
(c) Enrollees Using Home Health Per 100



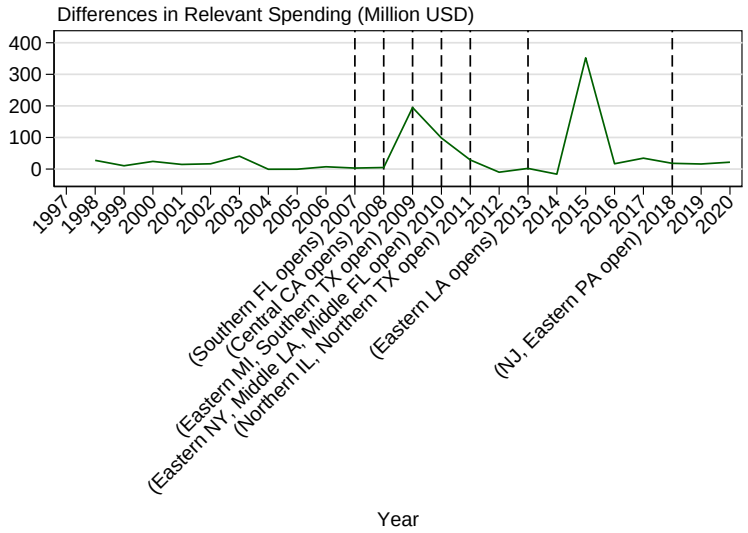
Notes: this figure shows event study estimates of β_r in equation 8 with several measures of per capita home health utilization as the outcome. The regressions are weighted by the number of Traditional Medicare enrollees in each county in 2016. The first gray dashed vertical line indicates the implementation of the policy in August 2016, while the second gray dashed line indicates the program's suspension in April 2017. Vertical lines denote 95% confidence intervals computed using standard errors clustered at the county level. The sample size is 79,392 county-months.

Figure OA.4: Spending Relevant to Strike Forces in HCFAC Reports

(a) Levels



(b) First Differences



Notes: Figure OA.4a displays trends in "relevant spending" used to estimate costs of the Strike Force, as defined in Appendix A. Figure OA.4b displays first differences in this spending.

D Appendix Tables

Table OA.1: Strike Force Office Openings

Federal Judicial District	City Contained	Strike Force Opening Date
Southern District of Florida	Miami	March 2007
Central District of California	Los Angeles	March 2008
Eastern District of Michigan	Detroit	June 2009
Southern District of Texas	Houston	July 2009
Eastern District of New York	New York	December 2009
Middle District of Louisiana	Baton Rouge	December 2009
Middle District of Florida	Tampa	December 2009
Northern District of Texas	Dallas	February 2011
Northern District of Illinois	Chicago	February 2011
Eastern District of Louisiana	New Orleans	May 2013

Notes: This table displays the location of each Strike Force office examined in our study and the date the office opened. There are two additional offices in the District of New Jersey and the Eastern District of Pennsylvania, which both opened in August 2018. Given that our sample period ends in 2019, we elected to exclude all counties in these districts from our sample.

Table OA.2: HHA Entry Moratoria Start Dates

Counties Targeted	State	Moratorium Start Date
Cook, DuPage, Kane, Lake, McHenry, Will	Illinois	July 2013
Miami-Dade, Monroe	Florida	July 2013
Collin, Dallas, Denton, Ellis, Kaufman, Rockwall, Tarrant	Texas	January 2014
Macomb, Monroe, Oakland, Washtenaw, Wayne	Michigan	January 2014
Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller	Texas	January 2014
Broward	Florida	January 2014
Rest of Illinois	Illinois	June 2016
Rest of Texas	Texas	June 2016
Rest of Michigan	Michigan	June 2016
Rest of Florida	Florida	June 2016

Notes: This table displays the name and state of each county affected by a moratorium on home health entry, as well as the date on which the moratorium started.

Table OA.3: Example HCFAC Cost Report

FY 2009 ALLOCATION OF HCFAC APPROPRIATION[5] (Dollars in millions)			
Organization	**Mandatory Allocation**	**Discretionary Allocation**	**Total Allocation**
Department of Health and Human Services			
Office of Inspector General[6]	$177.205	$18.967	$196.172
Office of the General Counsel	5.714	0	5.714
Administration on Aging	3.200	0	3.200
Centers for Medicare & Medicaid Services (CMS)	24.979	160.066	185.045
Subtotal	**$211.097**	**$179.033**	**$390.130**
Department of Justice			
United States Attorneys	$33.800	$9.023	$42.823
Civil Division	$15.069	$8.237	$23.306
Criminal Division	$3.780	$1.606	$5.386
Civil Rights Division	$2.376	$0.100	$2.476
Nursing Home and Elder Justice Initiative	$1.000	$0	$1.000
Subtotal	**$56.025[7]**	**$18.966**	**$74.991**
TOTAL	**$267.122**	**$197.999**	**$465.121**

Notes: This table presents an example of funding estimates from the Health Care Fraud and Abuse Control Program, published by the U.S. Department of Health and Human Services and the Department of Justice each year. We use these reports to estimate a back-of-the-envelope cost for the Strike Force.

Table OA.4: Yearly Strike Force Cost Estimates

Year	Strike Force Offices Open	Operation Cost (Millions)
2007	Southern FL	$3.138
2008	Southern FL, Central CA	$8.016
2009	Southern FL, Central CA, Eastern MI, Southern TX	$202.906
2010	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL	$301.287
2011	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX	$330.126
2012	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX	$330.126
2013	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA	$332.191
2014	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA	$332.191
2015	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA	$332.191
2016	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA	$332.191
2017	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA	$332.191
2018	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA, NJ, Eastern PA	$350.352
2019	Southern FL, Central CA, Eastern MI, Southern TX, Eastern NY, Middle LA, Middle FL, Northern IL, Northern TX, Eastern LA, NJ, Eastern PA	$350.352
Total		$3,537.258

Notes: This table displays back-of-the-envelope estimates of the cost of operating Medicare Fraud Strike Force offices by year. The methodology used to obtain these estimates is described in Appendix A.