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PHYSICIAN FEE POLICY AND MEDICAID PROGRAM COSTS

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ABSTRACT

We investigate the hypothesis that increasing access for the indigent to physician offices shifts care from hospital outpatient settings and lowers Medicaid costs (the so-called "offset effect"). To evaluate this hypothesis we exploit a large increase in physician fees in the Tennessee Medicaid program, using Georgia as a control. We find that beneficiaries shifted care from clinics to offices, but that there was little or no shifting from hospital outpatient departments or emergency rooms. Thus, we find no offset effect in outpatient expenditures. Inpatient admissions and expenditures fell, reducing overall program spending eight percent. Because the inpatient reduction did not occur in ambulatory-care-sensitive diagnoses, however, we cannot demonstrate a causal relationship with the fee change.

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Much has been written in both the academic literature and the popular press about excessive utilization of emergency rooms for primary care by the uninsured and by Medicaid recipients (Baker et al., 1991, Bindman et al., 1991). Indeed, this trend seems to be worsening, at least for those insured by Medicaid; Medicaid payments to hospital outpatient departments (including emergency rooms) as a percentage of payments to office-based physicians has risen by a startling amount, from 33 percent in 1975 to 83 percent in 1989 (Reilly et al., 1990).[1] There is also a widespread view that primary care is much more expensive when delivered in a hospital outpatient setting than when delivered in a physician's office. Therefore, many believe that the costs of caring for the publicly insured could be lowered, perhaps substantially, by redirecting their source of primary care towards office-based physicians and away from hospitals.

At the same time, research over the past 15 years has shown that physician participation in the Medicaid program responds to Medicaid's generosity of reimbursement relative to fees paid by private insurance. This suggests a straightforward mechanism for increasing the number of Medicaid patients seeking care at (potentially) more efficient doctors' offices: higher relative physician fees under the Medicaid program. Indeed, if the costs of treatment are in fact lower in doctor's offices, the costs to the Medicaid program of raising physician fees might be offset by the resulting shift in the locus of ambulatory treatment. In the extreme, raising physician fees could even save the program money, if care is delivered much more efficiently in the physician's office.

There are two impediments, however, to an increase in ambulatory care efficiency through higher physician fees. First, increased physician participation in Medicaid will not necessarily cause

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[1]This shift in the composition of spending cannot be entirely explained by higher relative inflation in the hospital sector. From 1975-1989, hospital service prices rose by 380%, while physician service prices rose by 318%. These relative rates of inflation would suggest an increase in the ratio from 0.33 to only 0.39. Some of this shift may be explained by an increase in ambulatory surgery that would usually not be done in offices.

a significant shift in the site at which care is delivered. Recent work by Fossett and Peterson (1989) and Fossett et al. (1992) has highlighted the segregation of office-based physicians from locations with the greatest Medicaid recipient concentration. If fee increases do not much reduce this segregation, then use of office-based physicians by Medicaid patients may change little in response to fee policy. Even if higher fees did reduce the segregation, it is not clear that the reduced distance to physicians' offices would lead Medicaid recipients to change their site of care. There may, for example, be substantial inertia in the choice of site of care.

Second, even if Medicaid eligibles shifted out of emergency rooms and into physician offices, the extent of cost savings, if any, to the Medicaid program is uncertain. Although costs per case are much higher in hospital outpatient departments than in office-based settings, patients seeking care at the hospital may also be sicker along dimensions that are not captured by existing controls for case mix. Thus, if a fee change induced a shift out of hospital emergency rooms, the *marginal* cost savings may be well below the difference between the current *average* charge for emergency room patients and the *average* charge for office-based patients. To the extent this is true, previous research has not correctly estimated the potential cost savings, if any, from redirecting care toward office-based physicians.

These two questions make using existing indirect evidence on how a fee increase might affect Medicaid costs a hazardous exercise. In this paper, therefore, we directly examine how a physician fee increase in the state of Tennessee affected Medicaid program expenditures. In May, 1986, the state increased its fees for primary care services dramatically; as a result, between 1985 and 1987 fees rose 50 percent in nominal terms and by 25 percent relative to Medicare. Recent work has documented that this fee increase substantially increased physician participation in the Tennessee Medicaid program (Adams, 1994). We extend this work to answer the two questions outlined above:

What was the effect on the site of care chosen by Medicaid enrollees? And what was the effect on total program costs, incorporating any offset effects from a shift in the site of care?

We address these questions by exploiting a unique dataset, the "Tape-to-Tape" (TT) data. These data provide a 100 percent sample of Medicaid enrollees for Tennessee, including information on their medical spending at different sites of care. We construct a longitudinal sample of individuals who were enrolled in the Medicaid program in both the year before and the year after the fee increase, in order to control for the underlying characteristics of the population. In addition, in order to control for contemporaneous trends in medical utilization and costs, we compare Tennessee's experience to that of a neighboring state, Georgia, which did not change its primary care fees in this period.

We have two findings of interest. First, care shifted towards physician's offices, but the shift came almost entirely from free-standing clinics rather than hospital outpatient departments or emergency rooms. Second, outpatient costs rose overall in Tennessee, relative to Georgia, suggesting no outpatient offset effects. At the same time, inpatient spending per enrollee fell, resulting in an overall program cost reduction of about eight percent. But the inpatient spending fall did not occur in diagnoses that are thought to be sensitive to the provision of better ambulatory care, and so that we are unable to attribute a causal relationship between the fee increase and the inpatient cost reduction.

The paper proceeds as follows. In Part I we review the past literature that is related to physician participation in Medicaid, site shifting, and cost differences across sites. In Part II we describe the policy change, the data, and our empirical methods. Part III models changes in the site of care, and Part IV explores differences in spending patterns. Part V concludes by discussing the policy implications of our findings.

Part I: Past Literature

Three different literatures bear on the topic that we investigate in this paper, although to our knowledge only one article has attempted to combine these different strands of work.

Physician Reimbursement and Access to Care

Many observers have alleged that there is a shortfall in the supply of physicians willing to serve Medicaid patients. Mitchell and Schurman (1984) report that in 1977-78 24 percent of primary care physicians and 36 percent of obstetricians saw no Medicaid patients. More recently the American Medical Association (1991) reported that 26 percent of physicians described themselves as "non-participants" in the Medicaid program, and only 34 percent reported that they participated "fully" and were accepting new Medicaid patients. One natural supply-side tool to improve the access of the poor is Medicaid fee policy. The Physician Payment Review Commission (PPRC, 1994) reports that Medicaid fees are on average only 47 percent of private fees and 73 percent of Medicare fees; and the PPRC (1991) reported that 38 state identified low fees as the major cause of low physician participation rates.

A stream of research in the late 1970s through the mid-1980s examined the effect of increased physician reimbursement on participation in the Medicaid program. Beginning with the work of Sloan, Mitchell, and Cromwell (1978) and Hadley (1979), and continuing through Held and Holahan (1985), Mitchell (1991), and Adams (1994), many researchers documented a strong correlation between higher relative (to Medicare or private payers) Medicaid fees and participation of physicians in the program.

Recent work by Fossett and Peterson (1989) and Fossett et al. (1992), however, has pointed out the disjunction between the location of the majority of Medicaid enrollees and the majority of

primary care physicians. For example, Fossett et al. (1992) compared Chicago neighborhoods with 50 percent or more of the population on welfare to neighborhoods with 10 percent or less of the population on welfare and found twice as many physicians (per child) practicing in the wealthier areas. The authors question whether increased reimbursement can truly increase access when physicians appear unwilling to serve the very areas in which Medicaid recipients are most concentrated. While an earlier study of Tennessee data (Adams, 1994) found that increased fees led to increased participation even after accounting for residential segregation, findings on physician caseloads and enrollee visits were weak.

Access to Care and Site of Care

A related literature is that on "site shifting," which investigates the effect of reimbursement on the site at which Medicaid patients receive their care. Long et al. (1985), using data from a cross-section of individuals in 1975, found strong evidence that higher relative Medicaid fees led to a larger fraction of visits by Medicaid patients in physicians' offices. Decker (1993), using a cross-section from 1987, also found that higher fees were associated with more use of the physician's office and less use of hospital-based care.

These findings, however, are beset by a potential methodological problem; other differences across locations, such as the availability of hospital-based care or extent of delivery of uncompensated care, may correlate with both the fees paid to physicians and the site of care chosen. For example, states may pay lower fees for office-based care in areas where hospital-based care is more available. To the extent that these differences are unobserved, they cannot be controlled for in a cross-sectional regression framework, and they may bias the estimation of the effect of

reimbursement on site of care.[2] If these factors are fixed over time for a given location, however, our use of a reimbursement change within the state of Tennessee will control for them.[3]

Site of Care and Cost of Care

A separate literature has estimated the cost differentials across sources of outpatient care. Fleming and Jones (1983) reported that costs per visit were roughly twice as high in hospital outpatient departments and emergency rooms as in physicians' offices. McDevitt and Dutton (1989) found that expenditures for the same type of episode of care for AFDC adults and children ranged from 10 to 107 percent more expensive in a hospital setting. And Stuart et al. (1990) found cost differences between outpatient departments/emergency rooms and physicians' offices exceeding 50 percent. These studies have not attempted to determine the cause of these cost differentials, but they are assumed to arise from one or both of two reasons: higher overhead or labor costs in hospital settings; and/or inefficient treatment of an episode of care in hospital settings, stemming either from a lack of knowledge of the patient's circumstances (a lack of "continuity of care") or from financial incentives to admit the patient.[4]

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[2]This problem is surmounted to some extent in Decker's work, since she compares treatment patterns of Medicaid and privately insured patients in high and low fee states. Medicaid patients may use quite different medical resources than do the privately insured, however, so that the problem of unobservable state effects could remain.

[3]One study which does control for unobserved state differences is that of Joel Cohen (1989), which examines aggregate data on the site of care, rather than the individual level data which we will use in this study. He finds evidence that raising physician fees under state Medicaid programs reduces the number of outpatient department recipients/capita but raises spending per recipient in that setting. This suggests that fee increases are leading to a substitution of low intensity care towards physicians' offices.

[4]It is important to note that cost differentials across sites of care, including those that we estimate, may not measure differences in resource utilization (social costs). In particular, given the extensive cross-subsidization within the hospital sector, hospital outpatient and emergency room

Although the studies of cost differentials by site have been careful to control for observed case-mix differences, they cannot control for unobserved differences in the type of patients who seek care in the various settings. As a result, as noted in the introduction, the *marginal* cost savings from switching patients from the emergency room to the physician's office may fall substantially below the *average* cost differential across the two sites.

Our strategy for obtaining an estimate that controls for unobserved patient differences, and therefore captures the true marginal cost savings, is straightforward. We use longitudinal data, which records the site and expenditures for every visit made by each Medicaid recipient. If the fee rise in Tennessee leads to increased access, we may see a substantial number of recipients switching their sites of care from hospitals to physicians' offices. The key point for our purposes is that this switch is made within a fixed population. That is, the overall sample of individuals is the same before and after the reimbursement increase; they are switching their site of care simply because access has increased. Thus, by looking at overall spending across all sites of care, we can measure the net effect of the fee increase on program expenditures.

Combining the Literatures

The goal of our paper is to combine these three areas of literature to estimate the net effect on program costs of paying physicians more. This question, to our knowledge, has only been addressed by one article, a simulation exercise by Stuart et al. (1990). They estimated a cost savings for the Medicaid program of 11 percent from diverting *all* users of hospital outpatient departments

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prices will reflect many other factors besides the costs of the resources used. Given our lack of a better measure, we focus on expenditure differences across sites of care in this paper. Moreover, from a policy perspective, what might matter is program spending, not social costs. For further discussion, see Altman and Socholitzky (1981).

to office-based physician care. However, theirs is not a behavioral study, but rather a combination of the findings from studies of the two component questions described above. To the extent that these earlier studies suffer from the problems that we have described, Stuart et al.'s findings are not valid for drawing inferences about the offset effect. Our approach, in contrast, uses the experience observed from an actual reimbursement increase to estimate any offset effect that resulted.

Part II: Empirical Strategy

The Policy Change

On May 1, 1986, the state of Tennessee increased its fees for primary care services in an effort to "encourage office visits as opposed to outpatient hospital services".[5] Fees for office visits rose from a (weighted) average of $14 to $21 from 1985 to 1987 as a result. This fee increase was also sizeable in relative terms; the fee relative to Medicare rose from a weighted average of 0.7 to 0.89 over this period, a 27 percent increase.[6]

As with any state-specific study, generalizability of the results is an important issue. Tennessee is an excellent state to study because it contains considerable diversity in the extent of urban development and the racial composition of the population. Furthermore, the patterns of utilization by Tennessee Medicaid recipients seem broadly representative of those of the U.S.: 65 percent of AFDC adults and children used a physician during 1991, compared to 58 percent for the nation as a whole; 15 percent used the hospital, relative to a national average of 13 percent.[7]

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[5]Tennessee Bureau of Medicaid, "History of Physician Program," 1992.

[6]Fee data are from the index for urban physicians used in Adams (1994). Weights are from Holahan (1991), and are based on the distribution of expenditures across procedure codes within the office visit category.

[7]Tabulations from unpublished HCFA Form 2082 data.

Moreover, Tennessee's reimbursement rate for primary care were roughly comparable to the national average in 1984, before our sample period began: the fee for a brief office exam was 96% that of the national average fee (Health Care Financing Administration, 1984).

Methodology

Our methodology for modelling the effect of this fee change is "difference-in-differences" (DD) estimation, as employed for example by Card (1992) or Gruber (1994). One means of estimating the effect of this policy change would be to calculate the difference in outcomes, such as total outpatient Medicaid spending, in Tennessee from before to after the policy change. This pre-post estimator would hold constant any time-invariant characteristics of the state, allowing one to infer the effect of the changing policy environment.

A potential problem with a pre-post design in a single state, however, is that if other factors were changing over this time period, we would incorrectly attribute their effect to the reimbursement change. For example, the mid-1980s saw a rapid increase in health care costs generally, the early spread of the AIDS virus, and increased use of crack cocaine. In theory, we could control for the first of these factors by deflating the change in Medicaid costs by a health care cost index, but we do not have accurate measures of cost changes at the state level and it is also difficult to control directly for other changes in the environment.[8]

Our solution is to find a control state which plausibly saw a similar change in its environment over this same time period. We use Georgia, which is a neighboring state to Tennessee for which

[8]A further problem with using an expenditure index to control for the change in spending is that the index should be specific to services covered by the Medicaid program.

Tape-to-Tape data are available, and which did not see a fee increase for primary care in this period.[9] Thus, its experience over this time period can be used to capture other factors that changed in this region, allowing us to isolate the impact of the reimbursement rise in Tennessee. That is, by comparing the difference in Tennessee from before to after the fee change to the difference in Georgia (DD estimation, or a pre-post design with a non-equivalent control group), we can identify the impact of the fee change only. We use the experience over one full calendar year before the fee change (1985) and one full calendar year afterwards (1987), both to leave several months for the policy to have its effect and to avoid issues of seasonality in medical consumption.

An important underlying assumption of DD estimation is that there were no changes besides the change in fee policy that affect our variables of interest in Tennessee relative to Georgia. No important changes in the physician reimbursement structure other than the one we study occurred in either state during this time period. In addition, both states reimbursed hospitals through a prospective reimbursement system throughout our sample period, and there were no significant changes in the structure of incentives under this system in either state. Nor were there important changes in the reimbursement of other outpatient providers such as freestanding clinics.[10]

There was, however, a dramatic relative increase in the size of the Medicaid population in Tennessee relative to Georgia. In both states, Medicaid for the non-elderly and non-disabled was traditionally limited primarily to single mothers and their children who were recipients of cash welfare under the Aid to Families with Dependent Children (AFDC) program. This limited

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[9]From Georgia Department of Medical Assistance timetable of physician payment changes. There was a fee increase in January, 1988 for non-primary care physicians in Georgia; but our sample period ends in 1987, so this should not affect our estimates ignoring any potential anticipatory effect.

[10]Based on conversations with the Tennessee and Georgia Medicaid offices.

eligibility to very low income families of a particular structure; in Tennessee in 1985, the AFDC eligibility cutoff for a family of 4 was 45 percent of the poverty line, and in Georgia it was 47 percent.

In 1987, however, Tennessee expanded eligibility to other low income groups that did not receive AFDC, including all women (for the expenditures of pregnancy only) and children with incomes up to the poverty line.[11] Georgia's Medicaid program did not pursue a similar eligibility expansion until after our sample period had ended. The result of this eligibility change in Tennessee was a dramatic enrollment rise. From January, 1985 to December, 1987, enrollment in Tennessee Medicaid grew from 221,292 to 298,889, or 35 percent. In contrast, enrollment in Georgia only grew from 305,992 to 331,948, an 9 percent rise.

The more rapid growth in Tennessee does not necessarily invalidate our DD strategy, as long as the change in enrollee characteristics in the two states over this period is comparable. In fact, however, they may not be, since the individuals enrolled in Tennessee under their eligibility expansions will be higher income and could have quite different utilization and spending patterns. If, for example, these new enrollees were more likely to see physicians in their offices and to spend less on medical care, our estimates would be biased towards a spurious finding that the fee change led to a shift in the site of care and to lower spending.

In order to deal with this potential problem, we use a sample of individuals who were enrolled in Medicaid for at least three months in both 1985 and 1987. These individuals were not those made newly eligible by the policy change in Tennessee; they reflect the more similar policy environments across these two states in 1985. As a result, any changes in their spending reflect

[11]This paralleled the beginning of a nationwide increase in eligibility for these groups that continued through the early-1990s; see Currie and Gruber (1996a,b) for details.

responses among a fixed population to the change in financial incentives for physicians, rather than a compositional change from the entrance of new and potentially different Medicaid enrollees. Put another way, all of the results for site of care and spending presented below are based on the same sample of enrollees, from before and after the fee increase.[12]

This solution has two drawbacks, however.[13] First, the results from this sample of continuous enrollees may not generalize to the entire Medicaid population. These enrollees may be reluctant to switch their site of care even if new physicians are participating; moreover, they may be the "harder core" AFDC population that lives in areas not served by physicians even after the fee increase. As a result, by using continuous enrollees we may understate the extent of site-shifting and offset effects from the fee rise. Therefore, for our major results on spending across sites of care, we also present the findings for the full sample of Medicaid enrollees, recognizing that this is not a true longitudinal sample. In fact, our results are fairly similar across the two samples, suggesting that problems of generalizability are not important.

The second problem, which is more difficult to address empirically, is the general equilibrium effects of the eligibility rise on the physician marketplace. The fact that a larger share of the population is now eligible for Medicaid in Tennessee, relative to Georgia, may increase physician participation more in Tennessee than in Georgia. This, and not the fee increase, could lead to a shift in the site of care. Given that we essentially have one degree of freedom, it is impossible to

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[12]Our choice of the three month cutoff reflects a balancing of two considerations. On the one hand, we want to use individuals who are sufficiently attached to the Medicaid program both before and after the fee increase. On the other hand, we do not want our results to simply reflect the behavior of persons who never leave the Medicaid program, since much of the Medicaid population bounces in and out of enrollment (Ellwood and Adams, 1990). By using a three month cutoff, we can capture both long-term continuous enrollees and those that use the program only periodically.

[13]We are grateful to our two anonymous referees for pointing out these limitations.

disentangle this alternative from our hypothesis of interest (a response to the rise in fees in Tennessee).

It seems unlikely, however, that an eligibility increase could lead to a net rise in access to office-based physicians for the Medicaid population. In fact, we think that the opposite is likely, due to excess demand for physician care among the Medicaid population. In a standard model of equilibrium in the physician market (ie. Held and Holahan, 1985), if there is excess demand then eligibility increases have no effect on the volume of trades. This model is supported by recent evidence in Baker and Royalty (1996), who examine the Medicaid expansions that occurred during our sample period and find no effect of eligibility changes on office-based physician volume, while there are large increases in non-office based volume (ie. clinics and outpatient departments). Thus, if anything, the contemporaneous relative eligibility expansions in Tennessee biases against a finding of shifting of care toward offices, due to excess demand for office-based physician care among the Medicaid population. It seems extremely unlikely that eligibility increases could actually lead to a rise in physician participation per enrollee, which is what would be required to bias in favor of a shift of care toward offices.

Data

The TT data are a longitudinal 100 percent sample of Medicaid recipients from 1980 to the present in four states, including Georgia and Tennessee.[14] The data contain a monthly individual enrollment file, which is linked over time using individual identifiers. There are files for every medical claim for both ambulatory and hospital inpatient care, and these can be matched to the longitudinal individual records to create enrollee-based expenditure records over time. There is also

[14]The other two states are California and Michigan.

a file of provider characteristics for each Medicaid provider in the state, which can be matched to the claims records by a provider ID.

As noted above, we use the files for Tennessee and Georgia for the years 1985 (before the fee change) and 1987 (afterwards), for our sample of continuous enrollees; and we confirm our key finding using the full sample of Medicaid enrollees in these years. We focus on the non-elderly Medicaid population, to avoid issues of interactions with Medicare coverage. We use information on number of claims and patient spending during 1985 and during 1987 at several different sites of care: physicians' offices; clinics; hospital outpatient departments; hospital emergency rooms; inpatient; and other sites. The longitudinal file has 179,159 Medicaid enrollees in Tennessee, and 259,323 enrollees in Georgia.

Part III: Site of Care

To investigate the effects of this fee change on the site at which care is delivered to Medicaid patients, we consider changes in the "dominant site of care" for our sample of enrollees. We define the dominant site of care to be the one in which the patient spends the majority of his or her dollars over the year.[15] We have calculated results both including and excluding money spent on lab and x-ray procedures, for which the site of care may be inappropriately measured.[16] The results are similar; we report the findings with lab and x-ray included. We consider four sites of primary care: physicians' offices; clinics; hospital outpatient departments; and emergency rooms.

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[15]Or period for which the enrollee was eligible if less than a year. All estimates are weighted by months enrolled, so that the results are representative of the average person enrolled in a given month.

[16]For example, Medicaid fee increases may cause more persons to go to physician's offices, but their lab tests and x-rays may be performed at a hospital.

Table 1 shows the change in the site of care for Medicaid patients enrolled in both years, for our sample of continuous enrollees. The figure in each cell is the proportion of patients for whom that site of care was the dominant site. In brackets under each figure, we present the share of patients with any dominant site for which the given site is dominant; patients may not have a dominant site of care if either (a) they do not use care at all during the year, or (b) they spend equal amounts at two different sites of care. In 1985, the physician's office was the dominant site of care for 26 percent of Tennessee enrollees, over one-third of all those who had a dominant site. As expected, this figure increased relative to Georgia, both in absolute value and as a share; indeed, the increase in use of this site was sizeable as a percentage of the 1985 Tennessee baseline (the square brackets).[17]

This rise in beneficiaries who used physician offices as their dominant site did not, however, come from falling use of hospital facilities. Although the likelihood of either the outpatient department or the emergency room's being the dominant site of care did fall in Tennessee relative to Georgia, in both cases the fall was tiny and insignificant. Rather, the major fall came in the percentage of persons for whom the clinic was the dominant site of care. In sum, we did not observe the expected shift from hospitals to offices, but we did observe a shift from clinics to offices.

The shift to offices from other sites is consistent with physician incentives. Physicians at clinics, emergency rooms, and outpatient departments in Tennessee are typically salaried staff physicians who are not paid according to the state fee schedule. As a result, the fee increase had

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[17]Our standard errors may be somewhat understated in this and the subsequent analyses to the extent that there is a common person-specific component to the errors both before and after the fee increase. Even in the limiting case where the site of care is perfectly correlated across the two years, however, it would increase our standard errors only by a factor of 1.4.

no direct effect on them, while it made Medicaid patients more attractive for office-based physicians.

It is more difficult, however, to draw welfare conclusions about the shift in site of care from clinics to offices than from emergency rooms to offices, because there is little research on the costs, and none that we know of on the benefits, of care delivered in a clinic setting. Gold (1981) and Gold and Greenlick (1981) found no difference in outpatient costs between hospital-based and freestanding HMO clinics; the probability of inpatient admission was higher in the hospital-based setting, however, so that total costs were higher. Stuart et al. (1990) estimated that total payments per year for Maryland Medicaid patients were approximately twice as high at hospital outpatient departments than at clinics, although the clinic and emergency room costs were similar. Clinic costs were approximately equal to office-based physician costs, although the probability of inpatient admission was higher.[18] There is no evidence on continuity of care at clinics relative to other sites. In short, the welfare effects of this change are murky. This suggests focusing instead on our ultimate variable of interest, program spending.

One potential problem with these findings is that defining dominant site of care based on expenditures may lead to some bias when relative fees are rising. Even if individuals go to the physician for the same services as before, a higher fraction of their spending will be at the physician's office. In order to deal with this problem, we have recomputed dominant site of care based on number of claims from each site of care, ignoring the amount of each claim. This prevents the problem of spurious identification from changing fees, but introduces two new problems: a "claim" is an abstract construct, so that dollar weighting is more appropriate; and this induces many

[18]Stuart et al.'s finding on admissions, though similar to ours below, may reflect unobserved case mix differences.

more "ties" in the data. Nevertheless, using this alternative metric allows us to confirm the basic patterns in the data.

Our results using claims, rather than dollars, to define the dominant site of care are presented in Table 2. The findings in the first two rows of this table are fairly similar to those in Table 1: a large relative rise in treatment in physician's offices, and a large relative drop in clinic utilization. But the second set of rows is somewhat different, with a reasonably large shift out of hospital outpatient departments and some shift into emergency rooms. Overall, there is some more evidence here for a shift out of hospitals (outpatient departments plus emergency rooms), and into physician's offices. But, on net, the majority of the shift is once again coming from clinics and not hospitals.

Part IV: Spending

Basic Results

We next consider how the fee change affected Medicaid program spending. In carrying out this DD analysis we must account for the varying numbers of months that individuals are enrolled in the program.[19] Hence, in each year we measure spending per enrollee per month.[20] We disaggregate total spending into inpatient and outpatient spending, and within the outpatient category disaggregate further to examine each site of care described in Table 1.

We show the results in Table 3. The dollar figures in many cells are low, but we are averaging in both the majority of enrollees that spend nothing in a month and the minority that have some spending. In interpreting the results, it is important to recall that as individuals shift across

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[19]Recall that all persons in our "continuous enrollees" sample are enrolled in the program for at least three months in each year, but they differ in the extent to which they are enrolled in the remaining nine months of the year.

[20]Although once again we weight by the number of months in the sample.

sites of care, the underlying health mix of the patient base at a given site may be changing. As a result, spending may change at a given site either because the number of patients are changing, or because the type of patients that use that site are different in 1985 and 1987. This is not an issue for overall spending per enrollee, however, since we have the same population of enrollees before and after.

As would be expected from the site of care results, spending at physician's offices in Tennessee rose over 40 percent relative to the baseline spending in Tennessee in 1985. This increase reflects both the increased utilization of physician's offices and the rise in fees paid to physicians.

The hypothesized fall in other sources of outpatient spending, however, did not materialize. Spending at both emergency rooms and hospital outpatient departments actually rose slightly, though in neither case were the increases significant. Surprisingly, spending at clinics actually rose in Tennessee relative to Georgia, despite the fact that the share of persons for whom the clinic was the dominant site of care fell (Table 2). Overall, total outpatient expenditures per person per month rose substantially, over 12 percent.[21] Thus, our analysis of outpatient spending does not support the hypothesized "offset effect;" there is no evidence that paying physicians more saves money at other outpatient locations.

Interestingly, however, there is a large and significant drop in inpatient spending in Tennessee relative to Georgia. Inpatient spending was virtually unchanged in Georgia, but fell by over $9 per enrollee per month in Tennessee. Overall, the DD estimates show that inpatient spending fell by almost 20 percent as a result of the fee increase. This suggests that there are

[21]Total outpatient spending also includes other spending at other sites which are not easily classified as offices, clinics, outpatient departments, or emergency rooms.

potential offset gains from increased physician fees, but that the source differs from that usually considered; rather than reducing other outpatient spending, the fee change appears to reduce inpatient spending. As a result, as the final row shows, overall spending falls by about 8% in Tennessee relative to Georgia around the time of the fee increase; this estimate is statistically significant.

Specification Checks

This is a striking finding, and it suggests that physician fee increases may have offset effects. The skewness of inpatient spending, however, can make estimates of the mean of inpatient spending not robust. As a result, we investigated whether this finding was driven by the experience of just a few enrollees, which could not plausibly reflect a response to the fee increase. In particular, we reanalyzed the spending results excluding the spending by the top one percent and the top five percent of spenders. That is, we excluded for each state and year those persons that spend the most, and then recomputed the averages over the new sample for that state and year.[22] Excluding the top one percent of spenders had no effect on our results; excluding the top five percent reduced the effects in dollar terms (not surprisingly), but not in percentage terms. Thus, our findings do not appear to be driven by outliers.

Another possible explanation for our inpatient finding is that there may have been some change in treatment styles or in billing procedures in Tennessee relative to Georgia over this period, invalidating our DD identification strategy. In this case, all of the inpatient reduction would arise from changes in measured spending conditional on admission, and not from changes in the number

[22]This does have the effect of making our data set an unbalanced panel, by excluding different persons from 1985 and 1987. An alternative would be to exclude those persons that spend the most, on average, over the two years. But this would have the disadvantage of including potentially influential outlying observations in one of the two years.

of admissions. Therefore, we can test this hypothesis by decomposing our spending results into the odds that enrollees have some spending (at a given site) in a year, and the amount of spending conditional on having some spending. We do so in the two panels of Table 4. For example, in Tennessee in 1985, 54 percent of enrollees had some spending at a physician's office at some point during the year.[23] Of enrollees who used the physician's office at some point, the average person spent $31 per month at that site.

In fact, Table 4 reveals a reduction in both the volume of inpatient admissions, and in spending conditional on admission to an inpatient department. Thus, these findings are not driven solely by some relative change in treatment of billing practices in Tennessee.

The results also show an increase in both the share of enrollees using physician's offices at all and their average spending per month at physician's offices. The former reflects the shift in the locus of care towards physician's offices as a dominant site that was noted in Table 2. The expenditure change is more difficult to interpret, because it reflects two changes: the fee increase and a potential change in the composition of the pool of patients receiving care at the physician's office. That is, as the share of persons using office-based care rises, the average person using that care may be of a different underlying health status. For other sites of care, however, there is no fee change, so any change in average spending reflects a compositional shift only.

For clinics the overall spending rise is composed of a sizeable reduction in the share of enrollees that have any spending at a clinic, and a large rise in average spending among those that still do have spending at clinics. This suggests that the patients shifting out of clinics spent less than the average clinic enrollee in 1985, and that the remaining persons using clinics in 1987 were

[23]Though it need not have been their dominant site of care.

disproportionately high spenders.[24] For hospital outpatient departments and emergency rooms, we see the opposite response; a higher share of persons have some spending at these sites, but these new spenders spend less than the 1985 average for the site (which can be deduced from the reduction in average spending per spender). This therefore implies that the new population using hospital outpatient/emergency care after the fee change is less sick than before.

As a final test of the robustness of this striking spending result, we move to estimation on the full sample, as opposed to the sample of continuous enrollees only. This allows us to assess whether our result is generalizable to the Medicaid population at large, although it does open the possibility of selection bias discussed earlier. In fact, our results here are quite similar, as we document in Table 5.[25] There is a large rise in physician office spending, that is matched by a rise in spending at other outpatient sites as well. But there is an enormous offsetting decline in inpatient spending, leading to a very sizeable overall spending decline. In fact, the overall decline is even larger than for our sample of continuous enrollees. Thus, while this finding is subject to some bias from changing sample composition, it suggests that our basic result is generalizable to the Medicaid population at large.

Avoidable vs. Non-Avoidable Hospitalizations

Our finding of a reduction in hospital inpatient spending in Tennessee relative to Georgia seems robust. A natural question therefore is: how plausible is it that the fee increase for primary

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[24]Note that this compositional shift still does not explain the overall rise in spending at clinics in Tennessee, however.

[25]It is interesting to note that the levels of spending are generally lower for the full sample, in both states; this is consistent with the notion that the marginal enrollees who move on and off the program are healthier than continuous enrollees.

care services might have reduced hospitalization? It is, for example, well known that the uninsured and those insured through Medicaid have higher rates of hospitalization than the general population for conditions that could be treated on an outpatient basis or avoided altogether, such as asthma and diabetes (Weissman, et al., 1992). Better or more continuous primary care might well have reduced such avoidable hospitalizations. Thus, one means of assessing the validity of our result is to see if the reduction in inpatient spending was disproportionately concentrated in these types of diagnoses.

We carry out this assessment by measuring avoidable inpatient spending, using the Weissman et al. categorization. We exclude hospitalizations with missing diagnosis codes, and define "avoidable" based on the primary diagnosis code only.[26] In Tennessee in 1985, roughly 5.1% of inpatient dollars were spent in these "avoidable" categories. We then compute a DD estimate of total dollars of avoidable hospital spending. We include those with zero spending in this analysis, so that the answer is not biased by changes in the share of the population being admitted.[27]

In Table 6, we present the DD estimate. In fact, there is no evidence of a reduction in avoidable spending in Tennessee relative to Georgia. In the second row, we show that the reduction is entirely in non-avoidable spending, which could have been inferred from comparing the first row to Table 3. Thus, at least according to the Weissman et al. categorization, the fee change was not operating through reducing inpatient admissions that were avoidable.

Of course, this is just one categorization of which hospital diagnoses are "avoidable", so the fact that these types of spending are not falling does not disprove that there is an offset effect at work

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[26]Our results are very similar if we either expand our definition to consider secondary diagnoses as well, or if we include any records with some (primary or secondary) non-missing diagnosis information.

[27]That is, if we just conditioned on admission, and if the fee change operated primarily through reducing avoidable admissions, we would miss its effects.

here. But it gives no strong reason to believe that the fee change had any causal relationship with the expenditure reduction.

Part V: Conclusions

As both federal and state governments struggle with the problem of rising Medicaid costs, the issue of efficiency in the delivery of Medicaid is critical. Perceived inefficiencies have been the impetus for increasing numbers of states, including Tennessee, to promote managed care for Medicaid patients (Physician Payment Review Commission 1995). An alternative means of potentially increasing the efficiency with which care is delivered is to bring more office-based physicians into the Medicaid program through fee increases. In theory, the cost savings from shifting the patient's site of care from hospital outpatient departments and emergency rooms to the physician's office could substantially offset any cost rises from the higher fees themselves.

In fact, we found mixed evidence for an offset effect. We examined a substantial fee increase in Tennessee, and used Georgia as a control state to capture contemporaneous trends. We found that the fee change did lead to physician participation increases along some dimensions. On the other hand, there was little or no drop in utilization of outpatient hospital services or emergency rooms, and total outpatient costs rose more rapidly in Tennessee than in Georgia. At the same time, however, there was a drop in hospital admissions and inpatient costs in Tennessee. This drop, which does not appear driven by outlier observations, led on balance to about a eight percent cost savings. But we are unable to attribute a causal relationship between physician fee policy and this very sizeable inpatient spending change. This finding nevertheless suggests the importance of future work which further tests for the substitutability of office-based primary care for inpatient hospital utilization. In addition, future work in this area could examine in more detail the content of care at

different outpatient sites, to assess more precisely the welfare implications of site shifting.

Our findings contradict earlier evidence that physician fee policy is a useful tool for shifting the site of outpatient care of Medicaid recipients out of the hospital. Our findings should not be construed as a rejection of physician fee policy as an instrument of Medicaid administrators, however. Even if the increase did not save money, it may have improved the quality of care received by Medicaid enrollees. Indeed, Currie, Gruber, and Fischer (1995) find that increased fees for obstetrician/gynecologists in Medicaid in the 1980s led to decreases in infant mortality. More work is needed to examine other margins along which fee changes may have tangible benefits for Medicaid patients. But the primary conclusion of our work is that fee increases probably do not lead to offsetting savings in Medicaid expenditures.

One might ask how or whether our findings apply in a world of Medicaid managed care. The answer may hinge on the degree of management. If the managed care plan is structured as a Preferred Provider Organization with rather loose management controls, our findings may apply. Quality, however, may well improve. Tighter utilization controls may save money, although they might also have adverse health status consequences, which could potentially offset the savings downstream. Apparently, decision-makers in Tennessee have decided that the benefits to the state from using more managed care outweighed the costs, because the state adopted in 1994 a mandatory managed care program, TennCare, for its Medicaid beneficiaries. The reduction in cost that we observed, whether causally related to the fee change or not, was not enough to keep the legislature from attempting more radical change. An important question for future research is whether this more radical approach is successful in lowering program costs.

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Table 1: Dominant Site of Care

	Tennesee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Physician's Office	0.259 (0.001) {34.1%}	0.294 (0.001) {38.5%}	0.035 (0.001)	0.355 (0.001) {47.9%}	0.335 (0.001) {45.7%}	-0.020 (0.001)	0.055 (0.002) [21.2%]
Clinic	0.197 (0.001) {26.0%}	0.165 (0.001) {21.6%}	-0.032 (0.001)	0.084 (0.001) {11.3%}	0.092 (0.001) {12.5%}	0.008 (0.001)	-0.041 (0.002) [-20.8%]
Hospital Outpatient Department	0.187 (0.001) {24.6%}	0.221 (0.001) {29.0%}	0.035 (0.001)	0.181 (0.001) {24.4%}	0.217 (0.001) {29.6}	0.036 (0.001)	-0.001 (0.002) [0.53%]
Emergency Room	0.117 (0.001) {15.4%}	0.083 (0.001) {10.8%}	-0.034 (0.001)	0.122 (0.001) {16.4%}	0.089 (0.001) {12.2%}	-0.032 (0.001)	-0.002 (0.001) [-1.71%]

Notes: Figures are the share of enrollees for whom each site is their dominant site of care for the year. Standard errors in parentheses; site effects as a share of all sites in brackets {}; DD estimates as a percentage of baseline (1985) values for Tennesee in square brackets []. "Before" is 1985; "After" is 1987 and 1988; "Diff" is after minus before; "Diff-in-diff" is diff for Tenesee minus diff for Georgia. N = 179,159 for Tennessee and 259,323 for Georgia.

Table 2: Dominant Site of Care - Claims-based Definition

	Tennesee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Physician's Office	0.350 (0.002) {40.8%}	0.371 (0.002) {43.5%}	0.021 (0.003)	0.452 (0.002) {54.9%}	0.401 (0.002) {47.9%}	-0.051 (0.003)	0.072 (0.004) [20.6%]
Clinic	0.187 (0.002) {26.0%}	0.133 (0.002) {15.6%}	-0.054 (0.003)	0.070 (0.001) {8.51%}	0.069 (0.001) {8.24%}	-0.001 (0.001)	-0.053 (0.003) [-28.3%]
Hospital Outpatient Department	0.291 (0.002) {33.9%}	0.309 (0.002) {36.2%}	0.018 (0.003)	0.231 (0.002) {28.1%}	0.313 (0.001) {37.4%}	0.082 (0.002)	-0.064 (0.004) [22.0%]
Emergency Room	0.030 (0.001) {3.50%}	0.040 (0.001) {4.69%}	0.010 (0.001)	0.070 (0.001) {8.51%}	0.054 (0.001) {6745%}	-0.016 (0.001)	0.026 (0.002) [86.7%]

Notes: Figures are the share of enrollees for whom each site is their dominant site of care for the year, based on claims rather than dolla
Standard errors in parentheses; site effects as a share of all sites in brackets {}; DD estimates as a percentage of baseline (1985) values f
Tennesee in square brackets []. "Before" is 1985; "After" is 1987 and 1988; "Diff" is after minus before; "Diff-in-diff" is diff for Tenesee min
diff for Georgia.

Table 3: Average Spending per Month

	Tennessee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Physician's Office	5.040 (0.075)	7.637 (0.115)	2.597 (0.137)	5.745 (0.104)	6.241 (0.119)	0.496 (0.158)	2.102 (0.209) [41.7%]
Clinic	7.151 (0.330)	9.358 (0.453)	2.207 (0.560)	3.055 (0.191)	3.764 (0.227)	0.710 (0.296)	1.498 (0.633) [20.9%]
Hospital Outpatient Department	8.402 (0.211)	11.50 (0.343)	3.103 (0.402)	7.014 (0.170)	9.890 (0.238)	2.876 (0.292)	0.226 (0.497) [2.69%]
Emergency Room	3.172 (0.054)	3.048 (0.054)	-0.123 (0.077)	2.454 (0.042)	2.210 (0.045)	-0.245 (0.062)	0.121 (0.098) [3.81%]
Total Outpatient	25.75 (0.464)	35.01 (0.707)	9.258 (0.845)	21.86 (0.371)	27.95 (0.501)	6.085 (0.623)	3.173 (1.050) [12.3%]
Total Inpatient	45.39 (1.346)	36.09 (1.110)	-9.299 (1.744)	45.73 (1.134)	45.19 (1.120)	-0.543 (1.593)	-8.756 (2.363) [-19.3%]
Total Dollars	71.14 (1.510)	71.10 (1.461)	-0.041 (2.101)	67.59 (1.279)	73.14 (1.352)	5.542 (1.861)	-5.583 (2.807) [7.85%]

Notes: Figures are average monthly spending at each site of care per enrollee/year. Standard errors in parentheses; DD estimates as a percentage of baseline (1985) values for Tennessee in square brackets []. "Before" is 1985; "After" is 1987 and 1988; "Diff" is after minus before; "Diff-in-diff" is diff for Tennessee minus diff for Georgia. N = 179,159 for Tennessee and 259,323 for Georgia.

Table 4: Decomposing Average Spending Per Month

	Tennessee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Fraction of Enrollees with Spending During Year at the Site							
Physician's Office	0.544 (0.004)	0.569 (0.004)	0.026 (0.005)	0.601 (0.003)	0.569 (0.003)	-0.030 (0.004)	0.058 (0.007) [10.7%]
Clinic	0.382 (0.004)	0.341 (0.004)	-0.041 (0.005)	0.193 (0.003)	0.211 (0.003)	0.017 (0.004)	-0.058 (0.006) [-15.2%]
Hospital Outpatient Department	0.412 (0.004)	0.439 (0.004)	0.027 (0.005)	0.406 (0.003)	0.402 (0.003)	-0.003 (0.004)	0.030 (0.007) [7.3%]
Emergency Room	0.356 (0.004)	0.359 (0.004)	0.002 (0.005)	0.337 (0.003)	0.288 (0.003)	-0.050 (0.004)	0.052 (0.007) [14.6%]
Total Outpatient	0.801 (0.003)	0.806 (0.003)	0.005 (0.004)	0.784 (0.003)	0.784 (0.003)	-0.001 (0.004)	0.006 (0.006) [0.75%]
Total Inpatient	0.187 (0.003)	0.156 (0.003)	-0.031 (0.004)	0.163 (0.002)	0.151 (0.002)	-0.012 (0.003)	-0.019 (0.006) [-10.2%]

Table 4, Continued

	Tennessee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Mean Spending per Month Conditional on Having Some Spending at Site During Year							
Physician's Office	31.04 (0.280)	43.38 (0.417)	12.33 (0.502)	32.70 (0.256)	38.11 (0.327)	5.416 (0.415)	6.964 (0.652) [22.4%]
Clinic	49.58 (1.097)	62.73 (1.570)	13.15 (1.916)	49.58 (1.098)	49.25 (1.231)	4.204 (1.659)	8.942 (2.535) [18.0%]
Hospital Outpatient Department	104.4 (2.130)	133.1 (2.584)	28.66 (3.349)	83.78 (1.659)	119.7 (2.105)	35.87 (2.680)	-7.205 (4.289) [-6.90%]
Emergency Room	55.36 (0.376)	52.93 (0.377)	-2.249 (0.533)	46.47 (0.465)	53.51 (1.059)	7.040 (1.157)	-9.469 (1.273) [-17.1%]
Total Outpatient	76.17 (0.872)	96.56 (1.204)	20.39 (1.486)	68.88 (0.706)	84.07 (0.897)	15.19 (1.141)	5.199 (1.874) [6.82%]
Total Inpatient	1681.4 (30.70)	1696.7 (34.67)	15.21 (46.31)	2013.7 (23.21)	2122.2 (26.95)	108.6 (35.56)	-93.35 (58.39) [5.55%]

Notes: Figures in top panel are share of enrollees who have spending at that site during the year; figures in second panel are mean spending per month conditional on having some spending at site during the year. Fractions add to more than one because enrollees have spending in multiple sites. Standard errors in parentheses; DD estimates as a percentage of baseline (1985) values for Tennessee in square brackets []. "Before" is 1985; "After" is 1987. "Diff" is after minus before; "Diff-in-diff" is diff for Tennessee minus diff for Georgia.

Table 5: Average Spending Per Month - Full Sample

	Tennesee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Physician's Office	3.480 (0.081)	6.192 (0.128)	2.712 (0.151)	4.598 (0.098)	5.599 (0.129)	1.001 (0.162)	1.711 (0.222)
Clinic	6.327 (0.174)	8.633 (0.141)	2.306 (0.224)	2.592 (0.059)	4.040 (0.139)	1.448 (0.151)	0.858 (0.270)
Hospital Outpatient Department	4.441 (0.159)	7.561 (0.151)	3.120 (0.219)	3.714 (0.073)	5.840 (0.190)	2.126 (0.204)	0.994 (0.229)
Emergency Room	3.064 (0.058)	3.700 (0.118)	0.636 (0.131)	2.374 (0.036)	2.880 (0.160)	0.506 (0.164)	0.130 (0.210)
Total Outpatient	24.71 (0.606)	38.53 (0.711)	13.83 (0.934)	20.96 (0.317)	30.75 (0.738)	9.785 (0.803)	4.042 (1.232)
Total Inpatient	53.81 (1.669)	56.07 (0.957)	2.266 (1.924)	48.55 (0.523)	63.52 (1.306)	14.97 (1.407)	-12.704 (2.383)
Total Dollars	78.52 (1.924)	94.60 (1.192)	16.08 (2.263)	69.51 (0.612)	94.27 (1.500)	24.76 (1.620)	8.680 (2.783)

Notes: Figures are average monthly spending at each site of care per enrollee/year. Standard errors in parentheses, for full sample of Medic enrollees; DD estimates as a percentage of baseline (1985) values for Tennessee in square brackets []. "Before" is 1985; "After" is 1987 1988; "Diff" is after minus before; "Diff-in-diff" is diff for Tennessee minus diff for Georgia.

Table 6: Avoidable and Non-Avoidable Spending on Inpatient Hospitalizations

	Tennesee			Georgia			Diff-in-Diff
	Before	After	Diff	Before	After	Diff	
Avoidable Dollars	3.48 (0.24)	3.47 (0.24)	-0.01 (0.34)	3.42 (0.17)	3.46 (0.17)	0.04 (0.24)	-0.05 (0.41) [1.44%]
Non-Avoidable Dollars	61.5 (1.24)	43.4 (0.93)	-18.1 (1.55)	60.3 (1.04)	53.8 (0.79)	-6.5 (1.31)	-11.6 (2.03) [18.9%]

Notes: Figures are the average amount of spending per month on each category of inpatient care; averages include those who received no hospital care. Standard errors in parentheses; DD estimates as a percentage of baseline (1985) values for Tennessee in square brackets []. "Before" is 1985; "After" is 1987. "Diff" is after minus before; "Diff-in-diff" is diff for Tennessee minus diff for Georgia.