Medicaid Reimbursement and Access to Physicians: Does Lower Reimbursement Mean Less Access to Care?

TAKE HOME POINTS

- Physicians do not appear to have been less likely to participate in the Medicaid program because of the reimbursement rate decrease; however, they do seem to have temporarily increased the number of patient visits to compensate for the lower level of reimbursement.
- Medicaid patients must drive farther for their care than the general population. In almost all counties Medicaid patients live farther from their physicians (both generalist and specialist) than do people in the general population.
- Although Medicaid beneficiaries had to travel farther in 2002 than they had in 2001 (for primary and specialty care as well as case management), by 2003 they were traveling distances similar to 2001.
- Negative impacts from the reimbursement rate decrease on access to care for Medicaid beneficiaries appear to have been temporary.
- Negative impacts on physicians’ income appear to have been compensated for by increasing the number of visits for each beneficiary.

Introduction

Mississippi is a low-income rural state that has numerous challenges and limitations in access to health care. One conventional measure of access to health care is a measure of people per provider or of people with given health care needs per specialist in those needs. This simple construct, however, is not at all simple to measure, nor does it accurately reflect how easy it is for patients to actually receive the services they need. First, it can be difficult to obtain accurate data on the number of health care professionals who are actively practicing in an area. Second, even when the number of health care professionals is known, it only indicates potential access and not actual accessible care for individuals with limited resources.

The issue of access is of particular import for Mississippi’s Medicaid program. The Medicaid program is required to provide its patients with health care access that is comparable to the access of privately insured patients. Medicaid patients and the Medicaid program, however, encounter acute access problems for a host of reasons, including concerns over malpractice; the size of the Medicaid population; and vacillating/decreasing reimbursement rates and physical proximity.
As a result of some physicians’ recent concerns over medical malpractice in Mississippi (and other U.S. states), many people, regardless of how they are insured, lack access to particular specialists who have given up practices or chosen to relocate. Because there are few data available regarding limitations to access, it is challenging to accurately estimate levels of access. This is further complicated in Mississippi, where Medicaid serves a substantial portion of state residents. Studies that investigate the impact of increasing caseloads and lowering reimbursements on physician participation in the Mississippi Medicaid program are missing, as the data needed to determine access to health care for Mississippians, particularly Mississippi’s Medicaid recipients, are lacking.

**Project Goals:** This project was designed to answer several research questions. First, did physician participation in the Mississippi Medicaid program change when reimbursement rates declined? Second, do Medicaid clients have the same level of access—as measured by physical proximity—to physicians as the general patient population? Finally, taking both physician participation and access for Medicaid clients into account, has there been change in terms of access to physicians for Medicaid patients in the aftermath of recent Medicaid reimbursement rate changes?

Mississippi has a large and rapidly growing Medicaid population. Nearly 18 percent of Mississippians receive healthcare through Medicaid, and the state has the sixth highest average annual growth rate of Medicaid enrollees. In Mississippi, the convergence of several important forces is contributing to an unhealthy medical environment for patients and physicians alike. Medicaid has been in financial crisis. Physician fees from Medicaid have been reduced in Mississippi as in many other states and are expected to continue to decline. Mississippi’s Medicaid temporarily stopped payment to physicians because resources were exhausted in March 2002. Additionally, many Mississippi physicians are limiting their Medicaid enrollment due to skyrocketing malpractice premiums and limited income from Medicaid patients. Finally, research indicates Mississippi physicians believe Medicaid patients have more medically complicated conditions and are more likely to sue, creating another possible barrier to access.
Several potentially dangerous scenarios for Mississippians are possible if physicians choose to limit their practices partially (by limiting the numbers or types of patients they see) or completely (by retiring or relocating) due to malpractice concerns. If fewer physicians accept Medicaid patients due to low payment rates, higher rates of complications, or concerns about greater liability, then the possibility of a crisis in health care access in Mississippi Medicaid also looms. This situation was exacerbated by the decrease in the Medicare reimbursement rates that occurred in 2002. By state law, Mississippi’s Medicaid payment rate is set as 90 percent of the Medicare reimbursement rate. When the federal government reduced Medicare compensation by 5.4 percent in 2002, there was a comparable reimbursement rate decrease for Mississippi Medicaid providers.

\textbf{Research Problems to be Addressed}

It is simply more difficult to provide medical services to a dispersed rural population than to a dense urban population, all else being held equal. There is also a potential future crisis in physician access resulting from premature retirements, an unwillingness to locate a practice in Mississippi and an increasing desire of Mississippi’s physicians to leave the state, as demonstrated by a related body of literature. Another body of research examines the impact of medical malpractice and tort reform on patient access, particularly for Medicaid patients. The combination of these bodies of research forms the basis for this research examining access differences for Mississippi’s Medicaid and private pay patients.

This combination of Medicaid access, the effects of rural vs. urban services, physician recruitment/retention, and malpractice issues has not been examined in a single research context nationally. There has been even less research in \textit{any} of these areas for Mississippi. The recent Medicaid reimbursement changes, paired with the malpractice struggles faced by Mississippi’s physicians, make an assessment of physician access critical. This report examines the following questions:
1. Did physician participation in the Mississippi Medicaid program change when reimbursement rates declined?
2. Do Medicaid patients have the same degree of geographic access to physicians as the general patient population?
3. Has access to physicians for Medicaid patients changed with the recent Medicaid reimbursement rate changes?

In documenting these processes for Mississippi, these results may also inform the similar health care crises being faced across the nation.

**Literature Review**

At the federal level, Medicaid is required by law to provide access to care for its beneficiaries that is comparable to that of the privately insured population. In Mississippi, equal access is an especially difficult challenge because Medicaid serves a largely rural, poverty-stricken and minority population. Mississippi physicians face lower income from capitated patients (like people covered by Medicaid) and high premiums on malpractice insurance in the state. This compounds problems of recruitment and contributes to increased interest in retirement or relocation out-of-state. The confluence of these characteristics of the health care sector, which are fairly unique to Mississippi, may contribute to an access crisis in the near future. However, without valid and reliable data on the physician workforce and the populations they serve, it is difficult to accurately characterize the current state of Medicaid access (or access for the general population) and the prospects for health care in Mississippi.

This paper describes research intended to expand our understanding of how physician shortages impact Medicaid clients. We explore how the challenges of existing physician shortages may be exacerbated by falling levels of physician participation in the Medicaid program as reimbursement rates decrease. These results can ultimately be used to inform Mississippi’s healthcare workforce policies. Understanding Mississippi’s status relative to the broader national context is also important. How do fee changes, medical malpractice and tort reform, and physician recruitment and retention combine in a rural setting to impact patients’ access to doctors within the Mississippi Medicaid program?
Access to Physicians for Medicaid Patients

Access to health care can be defined in at least five different ways:

- coverage by availability (providers per population)
- accessibility (e.g., insurance status, as discussed above)
- acceptability (a patient’s perceived gain from receiving care)
- contact (the process of obtaining care, e.g., transportation)
- effectiveness (e.g., a measure of the quality of the outcome of care).x

When taking these somewhat different aspects of access into account, and when controlling for some confounding factors, most research indicates that poor and minority individuals have lower levels of access to health care, resulting in lower utilization of care.xi,xii

As one of the largest federal government programs, the Medicaid program substantially impacts physicians’ practices throughout the Unites States. One in eight Americans and one in four children are covered under Medicaid.xiii Eighty-five percent of physicians surveyed in 2001 treated at least some Medicaid patients in their practice.xiv Although most U.S. physicians treat some Medicaid patients, more than 20 percent of those surveyed say they are accepting no new Medicaid patients.xv Those physicians whose services are limited through managed care programs are even less likely to accept new Medicaid patients than those not involved in managed care. Among physicians who receive at least 75 percent of their revenue from managed care, nearly 30 percent do not accept new Medicaid patients.xvi

Increases in Medicaid payments lagged behind the average level of inflation in the U.S. throughout most of the 1900s and also decreased relative to Medicare payments.xvii These payment reductions have increased concerns that physicians will be less likely to accept new Medicaid patients than in the past. Although federal law requires that physician fees be set high enough to insure sufficient participation in Medicaid, health policy researchers are concerned that Medicaid clients may not have access to physicians similar to that of the insured population. Cross-sectional research indicates that physicians are less likely to accept new Medicaid patients when fees are set too low and finds higher rates of physician participation where Medicaid payment schedules are more generous.xix,xx,xxi,xxii,xxiii,xxiv,xxv
Researchers estimate that it would take an average of $13 per hour increase (about 60 percent) to reach federal guidelines for half of the physicians fully participating in the Medicaid program. xxvi For some physicians, Medicaid participation is not merely an economic decision. They are committed to serving low-income populations, regardless of reimbursement. Other physicians, however, hold some negative attitudes toward Medicaid patients. xxvii In some instances, physicians appear to prefer treating uninsured patients rather than Medicaid patients. The uninsured patients require less paperwork and are regarded as more appreciative of their health care and less likely to sue for medical malpractice. xxviii

National research on physician access for Medicaid clients is mixed, particularly when exploring the impact of fee changes on physicians’ willingness to accept new Medicaid patients, although most research suggests that lower fees lead to worse access. A national survey of nearly 4,000 physicians studying the effects of Medicaid payment levels, capitation within the Medicaid program, and the level of paperwork associated with Medicaid found that each of these factors had a significant impact on physicians’ willingness to accept Medicaid clients. xxix These results reflect previous research showing the likelihood that physicians will accept new Medicaid patients is linked to higher payments. xxx Other research connects Medicaid clients’ lack of access to primary care physicians with higher rates of hospital services use (especially ER visits) and higher hospitalization rates. xxxi,xxxii,xxxiii Changes to the federal Medicaid program have allowed states to move Medicaid patients into managed care programs, which may also restrict access, particularly with respect to specialists. xxxiv With increases in managed care enrollment, payments are capitated, leaving less flexibility in physician charges and putting more pressure on physicians to pass on expenses and charge infrastructure costs to private pay patients. The bulk of the research suggests that lower Medicaid payments reduce the access of Medicaid patients to primary care physicians or specialists.
Inequalities in Access to Physicians in Rural Areas

Nationally, rural Americans represent 20 percent of the population, but only 11 percent of physicians are located in rural areas. The rural physician supply is already a problem and projections indicate that the problem may get worse. While the physician workforce grew nationally by nearly 25 percent from 1990 through 1997, in rural areas the physician workforce grew only by 11 percent. Rural areas started the 1990s with a physician shortage and this disadvantage increased through most of the decade.

In rural Mississippi, relatively high levels of poverty (20%) and large racial and ethnic minority populations (40% overall, with 36% being African American) further complicate the inequalities in health care access as rural access issues have been closely tied to these population composition variables. Rural residents also have higher risks of greater health complications compared to residents of metropolitan areas. Federal subsidies for development of rural clinics, the placement of international medical graduates (IMGs) in rural areas, and increases in non-physician providers represent one attempt to solve problems of inadequate access to health care in rural areas. However, the problems of unequal access have not been resolved by these actions. In fact, some anecdotal evidence shows that many physicians have adverse opinions about the quality of care provided by IMGs and non-physician providers.

Finally, the penetration of managed care in America’s health care system makes problems associated with inequalities in access to care in rural areas even more complex. This is particularly true in rural areas where managed care can be a more challenging delivery model as compared to urban areas where population and service density make packaging services easier. Given that most of Mississippi’s population is rural and that it has the highest concentration of African Americans in the nation, inequalities in access to care are likely to be even more intractable and extensive than in other places in the nation. They represent critical components of any analysis concerning the physician workforce in Mississippi.
Recruitment and Retention of Physicians

A critical part of recruiting and retaining physicians is in understanding the underlying processes that encourage doctors to come, stay, or leave critical areas. One study of physicians who had relocated identified decision factors including the quality and availability of hospital facilities, income potential, desirable professional partnerships, regular contact with other physicians, preferences for urban/rural location, spouse’s preferences, and community cultural advantages and prosperity. The perception that rural communities have less well-developed economies and medical infrastructure and larger elderly populations also inhibits rural communities’ abilities to recruit new physicians. Female general practitioners are less likely to choose a rural practice location, which means that recruitment challenges among the general practitioner population will increase as women represent a growing proportion of that group.

Physicians may find it harder to practice in rural areas due to professional isolation, lack of medical infrastructure, large catchment areas creating fewer chances to pool resources for expensive medical equipment, and shortages of trained professionals. This is combined with the need to provide services to a particularly challenging patient base. Rural patients are more likely to perceive their own health status as fair or poor compared to urban counterparts with similar health problems and because rural patients are also more likely to be self-employed, they are less likely to have access to employer-based health insurance. Finally, rural residents are more likely to experience travel challenges to see physicians, especially due to the general lack of public transportation.

Impacts of the Legal Climate on Access to Physicians

Historically, Mississippi’s legal climate has seemed to work against recruitment and retention of physicians for the state. Nationally, research shows that rural primary care physicians are likely to sell their private practices to non-local buyers, mainly due to concerns about managed care, constrained capacity to recruit colleagues, and increasing administrative burdens. State-specific research indicates
that many Mississippi physicians in 2002 were seriously considering relocating outside the state or early retirement due to malpractice pressures in the state. It is too early to understand how the impact of the 2003 liability reform may have affected physicians’ decisions about staying or going. Although medical malpractice seems unrelated to Medicaid at first glance, Mississippi physicians expressed concerns that most of their payments are in capitated programs (managed care, Medicare and Medicaid) and the rising costs of malpractice premiums must be absorbed by the physician through reductions in their net pay. The perception that Medicaid clients are more likely to bring suit against physicians further involves Medicaid in Mississippi’s retention/recruitment challenge.

Research Methods

Claims, eligibility and provider data files for the calendar years of 2001-2003 were provided by the Mississippi Division of Medicaid through their data intermediary. Using this data, several research questions were addressed:

1. Did physician participation in the Mississippi Medicaid program change when reimbursement rates declined? This is tested both by caseload analysis (patients/physician) and by frequency of patient visits (visits/patient).

2. Do Medicaid patients have the same degree of geographic access to physicians as the general patient population? This is tested through a spatial analysis of the location of physicians who accept Medicaid patients compared to spatial analysis of all physicians with the general population to determine whether access to generalists (and later, specialists) is comparable across the two populations.

3. Combining the first two research questions, has access to physicians for Medicaid patients changed with the recent Medicaid reimbursement rate changes? This is tested using the methods described for the previous research question, examining change over time.

Using the Medicaid data, we identified two groups of physicians, those who had any Medicaid billings and those physicians with at least 50 claims per year (defined in our study as Medicaid “active” physicians). These categories of physicians are compared at the county level to the number of licensed physicians in the particular county (calculated from the Mississippi State Board of Medical Licensure...
license renewals for each year). Results from these analyses were used to address the research question concerning how declining reimbursement may have affected physicians’ Medicaid-related practices.

The drive time analyses examine how far individuals must drive to access primary or specialty care. This analysis required six steps, named here and described in more detail in the Technical Appendix. They are (1) constructing a road network for geocoding; (2) geocoding all beneficiary and provider addresses; (3) identifying unique beneficiary-provider pairs; (4) analyzing the network of unique beneficiary-provider pairs; (5) calculating county and state average travel time to provider; and (6) calculating county and state annual travel times. Essentially, we estimated how long it took each Medicaid beneficiary to drive to each one of his or her physicians. By multiplying those times by the number of visits to a physician, we calculated an annual drive time.

Results

Research Question #1

The first research question asks whether the frequency of patient visits or physician participation in the Mississippi Medicaid program changed when reimbursement rates declined. Specifically, do physicians see patients more or less frequently since Medicaid reimbursement rates changed?

Physician Participation. The percentages of physicians in a given county who accept Medicaid are shown in Maps One and Two. In 2002, statewide, 67.4% of physicians saw at least one Medicaid patient per week (63.0% in 2003); the geographic variability in this rate can be seen in Maps 1 and 2. Most physicians in metropolitan areas treat Medicaid patients, but in surrounding counties smaller percentages of doctors treat Medicaid clientele. This suggests that Medicaid-accepting non-metropolitan doctors may be in short supply. Individuals in more rural areas may have to travel into metropolitan areas to receive care.

The expectation was that the percent of physicians treating Medicaid patients would decline between 2002 and 2003 due to decreases in reimbursement rates for Medicaid patients, although the
patterns of Medicaid service appear to be broadly similar. Aside from Clarke county, no county changes categories representing the proportion of physicians serving the Medicaid population between 2002 and 2003. For the counties with greater than 100% of physicians licensed to practice who are billing Medicaid from that county, it is thought that these physicians use their home address (in a different county) for licensing purposes and their office address for Medicaid billing purposes. Future research should attempt to address this problem.

Maps One and Two indicate the proportion of physicians in a county accepting Medicaid patients. Since these maps give no indication of the volume of Medicaid patients that are treated or whether treatment patterns or frequency changed in the aftermath of the decrease in reimbursement rates, Maps Three and Four depict the average Medicaid caseload per Medicaid billing physician at the county level. In 2002 statewide, each Medicaid billing physicians saw an average of 487 Medicaid patients; in 2003
they saw an average of 556. In both 2002 and in 2003, roughly 30 counties had average Medicaid physician patient loads ranging from 13 to 363 per year. The next group of counties had patient loads ranging from 363 to 697 Medicaid patients per year. There were fifteen counties with Medicaid patient loads between 697 and 1,368 in both years and in two counties (Humphreys and Quitman) physicians treated, on average, more than 1,368 Medicaid patients per year. There is an increase in patient load between the years of 2002 and 2003, suggesting that physicians accepting Medicaid patients are picking up additional patients from those doctors no longer accepting Medicaid patients. This may reflect an impact on Medicaid patient loads because of the reimbursement rate reduction.

Map Three. Average Number of Medicaid Patients per Medicaid Billing Physician, 2002.

Map Four. Average Number of Medicaid Patients per Medicaid Billing Physician, 2003.
Patient visits. There are also variations by year in terms of Medicaid patient visits. Primary care visits increased by nearly two visits per beneficiary per year from 2001 to 2002 and then decreased by nearly 2.5 visits per patient per year by 2003. Medicaid patient visits to specialists increased from fewer than 7 total visits per patient per year in 2001 to more than 7.5 in 2002 but returned to 2001 levels in 2003. Visits with case managers are also reported. Case managers are physicians who received a $3 per beneficiary per month fee to coordinate patients’ care.\textsuperscript{b,i} Case management visits jumped from fewer than 8 per year per patient in 2001 to nearly 10 in 2002, but declined to seven visits annually by 2003.

Generally the number of visits per patient per year between 2001 and 2002 increased. There was a comparable decrease between 2002 and 2003. The data indicate that lower reimbursement rates may have resulted in a temporary increase in the number of visits per patient per year.

| Table 1. Average Number of Visits to Providers per Client, 2001-2003 |
|-----------------|----------------|----------------|----------------|----------------|
| Provider Type Group | Year | Mean | Std. Deviation | Maximum | N |
| Primary Care     | 2001 | 9.02 | 12.31         | 807     | 119206 |
|                  | 2002 | 10.81| 17.19         | 1287    | 119182 |
|                  | 2003 | 8.51 | 15.72         | 1239    | 117834 |
|                  | 2001-2003 | 15.03 | 25.30 | 1636 | 224092 |
| Specialist       | 2001 | 6.68 | 9.69          | 494     | 164159 |
|                  | 2002 | 7.52 | 11.09         | 885     | 173720 |
|                  | 2003 | 6.97 | 10.97         | 595     | 169772 |
|                  | 2001-2003 | 10.95 | 17.16 | 1612 | 327624 |
| Case Management  | 2001 | 7.67 | 9.65          | 254     | 42617 |
|                  | 2002 | 9.82 | 11.94         | 225     | 43917 |
|                  | 2003 | 7.05 | 8.67          | 205     | 39885 |
|                  | 2001-2003 | 13.00 | 18.37 | 361  | 79914 |
| Total            | 2001 | 7.66 | 10.77         | 807     | 325982 |
|                  | 2002 | 8.98 | 13.75         | 1287    | 336819 |
|                  | 2003 | 7.54 | 12.69         | 1239    | 327491 |
|                  | 2001-2003 | 12.65 | 20.64 | 1636 | 631630 |

Research Question #2

The second research question asks whether Medicaid patients have the same physical access to physicians as compared to the general patient population. This analysis uses the travel time to an appointment as a measure of access. Drive time analyses calculated the estimated amount of time an
individual Medicaid client would have to drive to get to an appointment with his/her doctor. Access to primary care physicians for both Medicaid beneficiaries and the general population is discussed first, followed by an analysis of access to specialist care.

**Drive Time to Primary Care Physicians.** For the state as a whole (2001-2003), a Mississippi Medicaid client would drive an average of 24.5 minutes to get to a primary care physician appointment (Map Five). For counties in the lightest shade of blue (Adams, Bolivar, Grenada, Hancock, and Leflore), Medicaid clients’ drive times were 10+ minutes under the state’s 24.5-minute average. For another 16 counties, average drive times were less than the state average, but took longer than 14.5 minutes. Such counties include most that are relatively close to urban areas, such as Biloxi, Columbus, Jackson, Meridian, and Tupelo. Both these groups have travel times shorter than the state average.

In a group of 20 counties, Medicaid beneficiaries on average drive between 24.5 minutes and 34.5 minutes for primary care office visits. In those areas, beneficiaries drive up to ten minutes longer than the state drive time average to reach a primary care physician. This includes a group of counties west of Tupelo and/or south of Memphis (DeSoto, Lafayette, Panola, Tate and Yalobusha), another group located between Columbus and Tupelo (Chickasaw, Clay and Monroe), a third grouping east of Jackson, south of Meridian and/or north of Hattiesburg (e.g., Clarke, Jefferson Davis, Lauderdale, Smith, and Wayne) and two counties in the Delta (Sunflower and Carroll). Medicaid clients in these areas must travel to more densely populated areas of the state for medical care.

The final group of counties, depicted in the darkest shade of blue in Map Five, includes half of Mississippi’s counties. Patients in these counties have the longest average drive times to reach their primary care providers, spending more than 34.5 minutes to drive to a primary care physician. Patterns depicted in the maps and other data indicate that Medicaid clients in the southern part of Mississippi frequently drive down to the coast or up to Hattiesburg for primary care. For individuals in central Mississippi, many Medicaid clients drive to the Jackson metro area or Meridian for primary care. Finally, Medicaid clients in northeast Mississippi often drive to Tupelo or Memphis for their primary health care.
For the general population (non-Medicaid), the drive times are quite different (Map Six). For this comparison, we assumed that people are able to and/or interested in using the closest primary care physician—defined here as a family doctor, generalist, internist, pediatrician, or gynecologist. Using census data, we established where the population lives (census block population data). With licensure data for Mississippi’s physicians, we identified the location of the physicians’ offices. Using these locations, we calculated the driving time for each population point to reach the closest primary care physician. We know that individuals do not necessarily visit the primary care provider located nearest them, but this offers a rough approximation of how far the general population would need to travel to access care. The drive time estimates for the general population were used to calculate county-level and state-level general population average drive times to physically access health care.
Map six displays the comparison of the county-level general population average drive times to the average state drive time for Medicaid beneficiaries. In the general population, only residents of Amite, Issaquena, Lawrence, Tunica, and Wilkinson counties have to drive more than 34.5 minutes to seek primary care, whereas Medicaid beneficiaries in half of Mississippi counties are driving that distance for primary care (see Map Six). Residents in an additional fourteen counties are driving somewhat more than the average drive time for the Medicaid population—Benton, Covington, Franklin, Greene, Humphreys, Itawamba, Jasper, Jefferson Davis, Kemper, Quitman, Smith, Walthall, Webster, and Yalobusha. These are very rural counties, where primary care physicians are sparsely distributed. In the other 63 counties, drive times for general residents seeking primary care are shorter than the average Medicaid drive time. In general, Medicaid patients face longer drive times.

**Drive Time to Specialists.** Specialists, in this case, are defined as not being generalists (family doctors, general physicians, internists, obstetricians/gynecologists, and pediatricians). The average Medicaid recipient in Mississippi drives approximately 40 minutes to receive care from a specialist (Map Seven). In ten counties, Medicaid clients drive, on average, less than 30 minutes to their specialists’ offices; these counties are Alcorn, Harrison, Hinds, Jackson, Lauderdale, Leflore, Lincoln, Lowndes, Madison, and Rankin, encompassing the cities and towns of Brookhaven, Columbus, Corinth, Greenwood, Gulfport-Biloxi, Jackson, and Meridian. Medicaid beneficiaries who live in these counties have the shortest average travel for specialty care. In nineteen counties, Medicaid clients have an average drive time to specialist care between 30 and 40 minutes: Adams, Claiborne, Clay, Copiah, DeSoto, Forrest, Franklin, Hancock, Homes, Jefferson Davis, Lamar, Lee, Monroe, Oktibbeha, Pike, Prentiss, Scott, Stone, and Washington. In these two groups of counties, drive times are less than the state average travel time to specialists. Many of these counties are on the outskirts of larger cities where specialists are concentrated.
As with primary care physicians, the majority of the counties have travel time averages that are greater than the state average. Medicaid beneficiaries in 15 counties drive between 40 and 50 minutes, on average, to see a specialist. In the remaining 38 counties, the Medicaid beneficiaries’ average drive time to specialists exceeds 50 minutes. These counties tend to be more remote from population centers, in the northern central part of the state (between Jackson, Columbus, Tupelo, and Greenwood) or scattered across the bottom half of the state (in areas surrounding the coastal cities, Hattiesburg and Meridian).

In comparing the experiences of Medicaid clients who seek specialist care to the experiences of the general population, we assumed that the general population went to the closest available specialist. As with primary care access, we know that individuals do not necessarily use the closest specialist for treatment—particularly since the type of specialist they need might be much farther than the specialist who is closest to them—but this is one way to gain insight into the role travel times play in access to care.
for the Medicaid and general populations in the state. We again estimated where the population lives (at the census block level) and the specialist physician office locations. Using these locations, we calculated the drive time from each population point to the closest specialist. These drive time estimates were used to calculate county-level and state-level population average drive times.

Medicaid beneficiary drive times to a specialist (Map Seven) contrast starkly with the population’s estimated drive time (Map Eight). The vast majority of the Mississippi population can reach a specialist faster than the Medicaid population can. In fact, only 9 counties in the state fall above the state mean of nearly 40 minutes to a specialist: Claiborne, Greene, Issaquena, Sharkey, Simpson, Smith, Tishamingo, Wayne, and Wilkinson. According to the Census Bureau, together these counties hold just over 125,000 Mississippians—roughly 4% of the state’s population. Nearly all Mississippians can reach a specialist in less than 40 minutes of driving time, the average drive time for Medicaid beneficiaries.

Research Question #3:

The final research question examines whether Medicaid beneficiaries’ access to physicians, as measured through drive time, increased when reimbursement rates declined. The reimbursement rate change for which data are available went into effect January of 2002. To address this research question, we examined drive times (as detailed above) just prior to the reimbursement rate decline and for two years following the reimbursement rate decrease. The summary statistics are presented in the table below.
Table 2. Weighted Average Travel Time in Minutes from Client to Provider (weighted by number of visits), 2001-2003

<table>
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<th>Provider Type Group</th>
<th>Year</th>
<th>Mean</th>
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<td>2001</td>
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<td>2003</td>
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In 2001, Medicaid beneficiaries traveled an averaged of just less than 23 minutes per primary care physician visit. This increased to an average of 25.4 minutes in 2002 and was reduced to 24.5 minutes in 2003 (still higher than the 2001 average). Driving times to primary care physicians increased nearly three minutes per trip when reimbursement rates declined in 2002 and only rebounded slightly in 2003. As for driving to see specialists, the drive time was stable across the three-year study period, indicating the decrease in reimbursement rates did not increase the drive time for patients needing specialty care. For case management (largely completed through the HealthMACS primary care case management program, which is outlined in a separate policy brief), drive times increased substantially (from 21 minutes to 30 minutes) when reimbursement rates went down; additionally, the rebound that was noted in the primary care drive times was not as substantial for case management in 2003 (just a 3 minute decline, still 7 minutes longer than in 2001). The HealthMACS program was recently dismantled; so drive times for case management are no longer an issue. Overall, beneficiaries’ drive time increased two minutes between 2001 and 2002 (from 30.5 to 32.5 minutes) and decreased slightly (to 31.8) between 2002 and 2003.
Table 3. Weighted Total Annual Travel Time in Minutes from Client to Provider (Weighted by number of visits, 2001-2003)

<table>
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<th>Provider Type Group</th>
<th>Year</th>
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<td>55485</td>
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<td>213.86</td>
<td>516.03</td>
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<td>182.71</td>
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<td>243.79</td>
<td>599.31</td>
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<td>2002</td>
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|                     | 2003 | 233.74 | 640.52         | 55485   

Though the changes in drive times across the years might seem small, when accumulated to the annual amount of time a patient spends in the car, the differences become more substantial. Also, when accumulating to the total annual drive time, the change in the number of visits associated with each year is also taken into account. As a result, for primary care physician visits, the average drive time per year begins in 2001 at 224 minutes (just under four hours), increases to 264 minutes (four hours and 24 minutes) in 2002 and then decreases to below 2001 levels in 2003 (just under 207 minutes, or roughly 3.5 hours).

For specialty care a similar relationship is seen. Although patients drive further for specialty care, they clearly have fewer visits, as the annual total travel time is close to that of primary care; in other words, patients are only spending slightly more time per year in the car for specialty care than for primary care, despite the fact that each visit for specialty care takes longer. Also, the numbers for case management and averages for total time spent in the car for health care follow the same pattern—Medicaid beneficiaries were driving farther for their care in 2002 than they were in 2001 or in 2003. So, the reimbursement rate decrease increased the number of visits and the time spent in the car, but the effect only lasted for one year.
Limitations

One limitation of this study is its focus on physicians. The importance of other providers--particularly nurse practitioners--as sources of primary care for Medicaid patients needs to be addressed; however, that research question was outside the scope of this particular project. Future analyses on usual sources of care for Medicaid beneficiaries will include assessments of the import of nurse practitioners as sources of primary care within the Medicaid program. Although the approach we have taken to put the experiences of Mississippi Medicaid clients in a larger context is a creative way to answer research questions for which there are few obvious data available, there are several limitations to the study. The Medicaid data were not generated to support this type of research. Medicaid claims data are generated to enable the fiscal activities of the state, and their use for other research purposes is thus limited. Two other limitations to the method we used relate to issues relating to drive time calculations. First, there is a substantial amount of research regarding the “drive by” behavior of patients. That is, researchers understand that the general population does not necessarily seek care from the provider closest to home and that this may be especially true for individuals seeking specialist care. Unfortunately, there is no population level database that accurately characterizes this distance-to-access behavior, so the assumptions and comparisons we make are appropriate given the lack of more suitable data. Additionally, in real world experience, we know what type of specialist Medicaid beneficiaries see and where they are located; for the general population, we have to estimate distance to specialists by assuming the individual would simply the visit the nearest specialist, regardless of specialty. In other words, we make a disease specific estimate of specialty care for the Medicaid population and compare it to a non-specific estimate of specialty care for the comparison population.
Conclusions

We began this project with three research questions—each will be answered in turn here. First, we wanted to know if physician participation in the Mississippi Medicaid program changed when reimbursement rates declined. Contrary to our expectations, physicians do not appear to have been less likely to participate in the Medicaid program because of the reimbursement rate decrease; however, they do seem to have temporarily increased the number of patient visits to compensate for the lower level of reimbursement. That is, physicians were just as likely to participate and apparently saw their patients more frequently to maintain their income.

The second research question examined whether Medicaid patients have the same degree of geographic access to physicians as the general patient population. Although there are limitations to the existing research method (particularly the inability to focus on particular specialists for the general population), it is clear that Medicaid patients must drive farther for their care than the general population. Maps 6 and 8, in particular, indicate that in all but a handful of counties Medicaid patients live farther from their physicians than do people in the general population.

Finally, the third research question focused on combining the first two research questions: has access to physicians for Medicaid patients changed with the recent Medicaid reimbursement rate changes? Examining the final two tables, we see that although Medicaid beneficiaries had to travel farther in 2002 than they had in 2001 (for primary and specialty care as well as case management), by 2003 this increase had ebbed. That is, the reimbursement rate decrease led only to a temporary increase in travel time to physicians for Medicaid beneficiaries.
TAKE HOME POINTS

- Physicians do not appear to have been less likely to participate in the Medicaid program because of the reimbursement rate decrease; however, they do seem to have temporarily increased the number of patient visits to compensate for the lower level of reimbursement.
- Medicaid patients must drive farther for their care than the general population. In almost all counties Medicaid patients live farther from their physicians (both generalist and specialist) than do people in the general population.
- Although Medicaid beneficiaries had to travel farther in 2002 than they had in 2001 (for primary and specialty care as well as case management), by 2003 they were traveling distances similar to 2001.
- Negative impacts from the reimbursement rate decrease on access to care for Medicaid beneficiaries appear to have been temporary.
- Negative impacts on physicians’ income appear to have been compensated for by increasing the number of visits for each beneficiary.

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TECHNICAL APPENDIX

Construct Road Network. The Census 2000 Tiger/Line files provided the basic road network used for all of the drive time analysis. The Mississippi streets were combined with the streets of Alabama, Arkansas, Louisiana, and Tennessee to create a regional street network. The road segments were assigned an average speed based on road type—Freeway, Arterial or Local. This average speed and the length of the road segment were used to calculate a travel time (cost) for that segment in minutes. This cost (travel time) would be used later in calculating travel time for recipients and to find the closest provider for members of the general population.

Geocode Recipient and Provider Addresses. The recipient and provider addresses were geocoded to provide geographic coordinates for each entity. Geocoding is an address interpolation method that matches inputted addresses to an address dataset with an established geographic coordinate space. The recipient and provider addresses were first geocoded against the street network database. For those addresses that were not located, the next geocoding attempt was made using a ZIP+4 centroid (an X,Y coordinate representing the geographic center of a geographic object) database for Mississippi. For those still not geocoded, the next attempt used the ZIPCODE centroid database. The remaining unmatched addresses were matched to a city centroid database. This resulted in a recipient and a provider database where each entity has a geographic location.

Identify Unique Recipient-Provider Pairs. Using the Medicaid dataset, patient bills were matched to the provider and recipient databases to identify every unique recipient-provider combination. During this process, the numbers of billing events were also collected for use in calculating annual travel times.

Network analysis of Recipient-Provider Pairs. To calculate the travel time, we used ESRI’s ArcGIS 3.3, the Network Analyst Extension, and an avenue script for processing the network analysis. The network analysis algorithm uses a road network to calculate the least-cost travel path (in this case looking at the shortest time) for a recipient to travel to the provider. Using this method, the travel time for each unique recipient-provider pair was calculated.

County and State Travel Time to Provider Means. Using the results of the network analysis, specific provider populations were examined more closely. Primary Care Physicians, Specialists, and Case Management Providers were each selected for specific analysis. The county of residence was assigned to each recipient using the geocoded location from the recipient database (presumably their residence). This information is used to calculate mean county and state travel times of recipients to each specific type of provider.

Annual Travel Time. Using the results of the network analysis, annual travel times to specific provider populations were also calculated. During the identification of unique recipient-provider pairs, the numbers of unique billing events (visits) were also collected. The recipient travel time to the provider was multiplied by two, representing a round trip, which was then multiplied by the number of visits the recipient made to the provider. These numbers were broken out by provider type (Primary Care Physicians, Specialists, and Case Management) and used to calculate total annual recipient drive time state and county means for Medicaid recipients.


This was part of the HealthMACS primary care case management program. This program is no longer in place. It was disbanded in 2003.

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