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Comparing Urban And Rural Physicians
by Mark E. Miller and Stephen Zuckerman

Policymakers assume that higher relative fees for physicians in rural areas will help assure access to health care and may increase physician supply. For example, the Omnibus Budget Reconciliation Acts (OBRA) of 1987 and 1989 provided bonus payments to physicians practicing in health manpower shortage areas (HMSAs). For Medicare, the federal insurance program for the nation’s elderly, Congress is attempting to reduce geographic fee differentials as part of the recently enacted Medicare physician payment reform. Under the reform, Medicare will recognize only one-quarter of the difference in the cost of physician time in computing geographic adjustment factors. This will increase the redistribution in Medicare revenues from urban to rural physicians relative to an adjustment that fully recognizes these cost differences.

In this DataWatch, we provide a descriptive analysis of the differences between urban and rural physicians. Among other characteristics, we compare physicians in terms of specialization, utilization, practice expenses, income, and Medicare involvement. We also identify aspects of physician behavior that are of particular concern to Medicare policymakers. For example, we compare current differences in participation and balance billing behavior. If assignment is less prevalent in rural areas, then the new limits on balance billing could offset rural areas’ favorable treatment under the new fee schedule’s geographic adjustment factors.

Data And Methods

The data for this analysis are drawn from the 1986 American Medical Association’s (AMA’s) Socioeconomic Monitoring System (SMS) survey. For this study, we classified physicians by location using the 1980 Human Resource Profile County (HRPC) codes established by the Office of Management and Budget. After assigning a county code to each

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physician in our sample, we then collapsed the nine HRPC categories into three broad categories: metropolitan statistical area (MSA), nonmetropolitan adjacent to an MSA, and nonmetropolitan nonadjacent to an MSA. Of our sample, 3,358 physicians are in metropolitan counties, 260 are in nonmetropolitan adjacent, and 393 are in nonmetropolitan nonadjacent counties. For expository purposes, we term the three county classifications “urban,” “adjacent,” and “outlying,” respectively. Physicians in adjacent and outlying counties are referred to as “rural.”

The sample for adjacent and outlying counties is small, and our significance tests are sensitive to sample size. Small sample sizes reduce the probability of rejecting the null hypothesis. Thus, the statistically significant results reported below are conservative. However, the combination of a single year of data and small sample size leads us to argue that the results should be treated as suggestive rather than definitive. Future comparisons between these categories of rural physicians can be improved through oversampling or combining multiple years of data.

### Results

**Location and specialty.** Exhibit 1 shows significant differences in specialty across county types. Rural physicians—in both adjacent and
outlying counties—are less likely than urban physicians to specialize in medical specialties or other surgical subspecialties. Rural physicians are much more likely to be in general practice (over 30 percent) than their urban peers (13 percent). Among surgeons, the greatest difference is between urban and outlying counties. Although physician populations in these areas contain the same proportion of surgeons (20 percent), urban counties are more frequently served by ophthalmologists, orthopedists, and other surgical subspecialties than are outlying counties. Outlying counties have a higher proportion of general surgeons.

From these results, it is clear that location and specialty are strongly related. Because of this relationship, simple displays of physician characteristics presented by location may also reflect the influence of specialty, as well as other variables correlated with location. To explore geographic differences while controlling for potentially confounding factors, we regress each physician characteristic on location, specialty, and a set of other relevant control variables (age, sex, board certification, solo practice, and type of medical school attended). Our purpose in estimating these regression equations is to determine whether our descriptive results are altered when the influence of other variables, primarily specialty, is controlled. If the location variables are significant in the regression equations, we conclude that there are significant geographic differences beyond those related to specialty. We could adjust sample means for differences in specialty composition. However, in a background study of this type, we have chosen to display the unadjusted data.

Board certification, type of practice, and employment status variations are also documented in Exhibit 1. In urban counties, 70 percent of physicians are board certified, compared with about 60 percent in rural counties. The board certification differential is not due solely to variations in specialty composition. Even after controlling for specialty, board certification is still less prevalent in rural areas. Although the descriptive analysis finds that physicians in adjacent counties are significantly more likely to be organized in solo practice (47 percent) than are urban physicians (40 percent), controlling for specialty, there is no difference in rates of solo practice across location.

Patient visits. We found significant differences in the average number of Medicare patient visits. Exhibit 2 compares the average number of patient visits for Medicare and non-Medicare patients by county type and place of service. Both categories of rural physicians have more Medicare patient visits per week (forty-eight visits per week) than their urban counterparts (thirty-three visits per week). In addition, the greater volume of Medicare patient visits among rural county physicians is largely true across all nonsurgery service settings (such as office and hospital).
## Exhibit 2
**Weekly Medicare And Non-Medicare Utilization Per Physician, By County Type**

<table>
<thead>
<tr>
<th></th>
<th>Rural Medicare</th>
<th>Non-Medicare</th>
<th>Rural Medicare</th>
<th>Non-Medicare</th>
<th>Rural Medicare</th>
<th>Non-Medicare</th>
<th>Total Medicare</th>
<th>Non-Medicare</th>
<th>Total Medicare</th>
<th>Non-Medicare</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surgery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operations</td>
<td>0.84</td>
<td>2.02</td>
<td>0.95</td>
<td>1.81</td>
<td>0.95</td>
<td>1.95</td>
<td>0.86</td>
<td>2.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assists</td>
<td>0.18</td>
<td>0.38</td>
<td>0.26</td>
<td>0.29</td>
<td>0.24</td>
<td>0.37</td>
<td>0.19</td>
<td>0.38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total surgeries</td>
<td>1.02</td>
<td>2.40</td>
<td>1.21</td>
<td>2.10</td>
<td>1.19</td>
<td>2.32</td>
<td>1.05</td>
<td>2.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nonsurgery</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient visits in office</td>
<td>17.88^a</td>
<td>57.66^b</td>
<td>26.02^c</td>
<td>63.65</td>
<td>26.85^c</td>
<td>65.72^c</td>
<td>19.43</td>
<td>58.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient visits on hospital rounds</td>
<td>9.86^b</td>
<td>15.11</td>
<td>12.51</td>
<td>12.69</td>
<td>13.23^c</td>
<td>16.27</td>
<td>10.41</td>
<td>15.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient visits in emergency room</td>
<td>3.11^d</td>
<td>8.82</td>
<td>5.44^c</td>
<td>12.88^b</td>
<td>3.88</td>
<td>6.97^d</td>
<td>3.36</td>
<td>8.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient visits in other locations</td>
<td>1.82^a</td>
<td>0.59</td>
<td>3.74^c</td>
<td>0.73</td>
<td>4.02^c</td>
<td>0.92</td>
<td>2.19</td>
<td>0.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total patient visits, all nonsurgical settings</td>
<td>32.67^a</td>
<td>82.15</td>
<td>47.71^c</td>
<td>89.95</td>
<td>47.98^c</td>
<td>89.88</td>
<td>35.40</td>
<td>83.55</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: American Medical Association (AMA) 1986 Socioeconomic Monitoring System survey.

Note: Total surgery and nonsurgery category components do not necessarily add to category totals due to rounding.

^aMean is statistically different from “adjacent” and “outlying” means at 95 percent confidence level.

^bMean is statistically different from “outlying” mean at 95 percent confidence level.

^cMean is statistically different from “urban” mean at 95 percent confidence level.

^dMean is statistically different from “adjacent” mean at 95 percent confidence level.

These utilization differences are also observed in the regression analyses.

**Fees, income, and expenses.** We examined fee differentials by looking at average fees for three types of visits: follow-up hospital visits and office visits with new and established patients (Exhibit 3). For all three visits, fees charged by urban physicians are significantly higher than those charged by rural physicians. Fees charged by adjacent and outlying county
physicians are not significantly different from each other. However, the only statistically significant difference in average annual net income is between urban and outlying county physicians. Our regression analysis also finds that incomes of urban county physicians are higher (significant at the 90 percent confidence level) than are those of outlying county physicians, even after controlling for specialty. Finally, the data indicate no significant difference in average total practice expenses between urban and rural locations, again even after controlling for specialty.

**Medicare and other payers.** The 1984 AMA SMS survey indicates that 46 percent of physicians nationwide participate in Medicare. This number is considerably higher than that reported by the Health Care Financing Administration (HCFA) for 1986. HCFA, which defines participation as physicians who have signed a participation agreement, reports participation rates of 28 percent in 1986 and 37 percent in 1988. The wording of the AMA’s questionnaire apparently resulted in a higher estimate of participation because it did not explicitly refer to a signed agreement. However, this error in defining participation is not likely to be correlated with county type and therefore should not alter our conclusions about participation differentials.

The AMA data indicate that urban county physicians have significantly higher participation rates than physicians in rural counties (Exhibit 4). Medicare participation rates in urban counties are 47 percent, compared with rates of 38–39 percent in rural counties. Holding specialty constant, our regressions indicate that rural physicians have significantly

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**Exhibit 4**

Characteristics Of Third-Party Payment For Physician Services, By County Type

<table>
<thead>
<tr>
<th>Source of Revenue</th>
<th>Urban</th>
<th>Rural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare participation rates</td>
<td>47.0%</td>
<td>38.7%</td>
<td>37.5%</td>
</tr>
<tr>
<td>Average percentage of Medicare services assigned</td>
<td>28.4</td>
<td>25.0</td>
<td>23.9</td>
</tr>
<tr>
<td>Average percentage of office visit fee covered by Medicare</td>
<td>69.8</td>
<td>71.1</td>
<td>70.8</td>
</tr>
<tr>
<td>Sources of revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare</td>
<td>23.4</td>
<td>27.0</td>
<td>27.3</td>
</tr>
<tr>
<td>Medicaid</td>
<td>8.4</td>
<td>10.9</td>
<td>11.9</td>
</tr>
<tr>
<td>Blue Cross/Blue Shield</td>
<td>20.3</td>
<td>19.5</td>
<td>18.7</td>
</tr>
<tr>
<td>Other private third-party payers</td>
<td>24.7</td>
<td>18.4</td>
<td>20.4</td>
</tr>
<tr>
<td>Not reimbursed by third-party payers</td>
<td>23.2</td>
<td>25.2</td>
<td>21.5</td>
</tr>
</tbody>
</table>

Sources: American Medical Association (AMA) 1986 Socioeconomic Monitoring System survey.

Note: Assignment rates are for nonparticipating physicians.

*Mean is statistically different from “adjacent” and “outlying” mean at 95 percent confidence level.

*Mean is statistically different from “urban” mean at 95 percent confidence level.
lower participation rates than urban physicians (for adjacent physicians this difference is significant at the 90 percent confidence level).

Physicians who choose not to participate in Medicare have the option of accepting assignment case by case. Although the descriptive analysis indicates no significant difference in assignment rates across location, our regressions show that location does play a role in explaining differences in assignment. After controlling for specialty, nonparticipating outlying county physicians are less likely than nonparticipating urban county physicians to accept assignment (this finding is significant at the 90 percent confidence level). We find no difference in the percentage of the physician fee covered by Medicare across locations. These findings are consistent with considerable evidence indicating that participation and assignment rates are lower in rural areas.\(^6\)

Exhibit 4 also shows that rural county physicians are more dependent on public insurers for revenue. Both categories of rural county physicians receive a statistically greater percentage of their revenue from Medicare than urban county physicians receive. In urban counties, physicians report that 23 percent of their revenue comes from Medicare, compared with 27 percent in rural counties. Physicians in both rural county categories also receive statistically greater proportions of their revenue (11–12 percent) from Medicaid than physicians in urban counties receive (8 percent). Our regression analysis controlling for specialty supports these conclusions.

Conversely, urban county physicians receive a greater proportion of their revenues from Blue Cross/Blue Shield and other private third-party payers than rural county physicians receive. However, this difference is not due to variations in Blue Cross/Blue Shield coverage; physicians in all three county types receive about the same amount of revenue from the Blues (19–20 percent). Urban physicians receive a significantly greater proportion of revenue (25 percent) from other private third-party payers (such as commercial insurers and health maintenance organizations) than do either category of rural physicians (18–20 percent). There are no statistical differences in the proportion of revenues received directly from the patient across county types. Our regression results support these conclusions, with one qualification. Physicians in remote counties receive slightly less revenue from patients than do urban physicians, controlling for specialty and other factors.

We chose to reexamine selected variables to determine whether differences between urban and rural physicians vary with the degree of Medicare involvement. There are two reasons to examine differences by degree of Medicare dependency. First, physicians who have caseloads composed largely of the elderly may have fundamentally different practices.
Medicare policymakers may regard differences between urban and rural physicians who treat large numbers of Medicare patients as more relevant. The degree of Medicare dependency is measured by the percentage of revenues obtained from Medicare. Just over 78 percent (3,135) of the sample physicians reported the percentage of revenues received from Medicare. To facilitate analysis, the sample was divided based on Medicare revenue. In the first group (30 percent of physicians), Medicare accounts for 9 percent or less of revenues; in the second group (30 percent of physicians), Medicare accounts for between 10 and 29 percent of revenues; and in the last group (40 percent of physicians), Medicare accounts for 30 percent or more of revenues.

Exhibit 5 suggests that Medicare dependency affects some of the relationships observed above, but not others. The average fees indicate that regardless of the level of Medicare dependency, urban physicians charge higher fees than rural physicians. (This is also true of other fees not reported in the exhibit.) Medicare dependency is associated with income in two ways. Among high-dependency physicians, outlying county physicians earn less than urban county physicians, but it also appears that high-dependency physicians earn more than low-dependency physicians, regardless of location. The level of Medicare dependency

<table>
<thead>
<tr>
<th></th>
<th>High dependency</th>
<th>Low dependency</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td></td>
<td>Rural</td>
</tr>
<tr>
<td></td>
<td>Urban</td>
<td>Adjacent</td>
<td>Outlying</td>
</tr>
<tr>
<td>Medicare partici-pation rates</td>
<td>48.0%</td>
<td>41.7%</td>
<td>44.1%</td>
</tr>
<tr>
<td>Assignment rates</td>
<td>32.1%</td>
<td>30.5%</td>
<td>23.5%</td>
</tr>
<tr>
<td>Office visit, new patient</td>
<td>$66.56</td>
<td>$41.70</td>
<td>$41.94</td>
</tr>
<tr>
<td>Average annual total expenses</td>
<td>90,935</td>
<td>84,078</td>
<td>113,202</td>
</tr>
</tbody>
</table>

Source: American Medical Association (AMA) 1986 Socioeconomic Monitoring System survey.

Note: Medicare dependency is defined by percentage of revenues from Medicare. High dependency denotes 30–100 percent of funds from Medicare; low dependency, 0–9 percent. Because there is no practical way to report statistical differences between means for both location and Medicare dependency in the same exhibit, the Medicare dependency significance tests are not reported. Measures of statistical difference between Medicare dependency category means are used to inform the discussion. Assignment rates reflect average percentage of Medicare services and are for nonparticipating physicians.

a Mean is statistically different from “adjacent” and “outlying” means at 95 percent confidence level.

b Mean is statistically different from “urban” mean at 95 percent confidence level.

c Mean is statistically different from “outlying” mean at 95 percent confidence level.
does not affect average annual expenses; we still find no differences between urban and rural locations.

Medicare dependency also plays a role in altering geographic patterns of Medicare participation and assignment. Among all physicians, Exhibit 4 showed that participation rates were about ten percentage points lower in rural counties than they are in urban counties. Once Medicare dependency is introduced, the difference is only present for low-dependency physicians. This suggests that the differences in participation rates across areas are driven by low-dependency physicians. The data indicate that participation rates are higher for high-dependency physicians, and there are no statistical differences across areas. This suggests that physicians with heavy Medicare caseloads are more likely to choose payment certainty, regardless of location. However, among high-dependency nonparticipants, there are significant differences in assignment behavior. In particular, nonparticipating outlying county physicians with heavy Medicare dependency are more likely to balance bill than to accept Medicare-allowed amounts as payment in full.

Policy Implications

We urge caution in drawing definitive conclusions from this study, which is primarily descriptive and based on one year of data. Instead, these findings suggest a number of issues that may arise in the face of Medicare physician payment reform. Also, the relative importance of our results will depend on readers’ perspectives. Rural advocates might highlight the fact that lower fees in outlying rural areas are associated with lower physician earnings, despite the fact that these rural providers have more Medicare patient visits than urban physicians. Medicare policymakers, alternatively, might view the comparable participation rates among high-dependency Medicare providers as evidence that historical fee differentials have not imposed insurmountable barriers to access and that high Medicare dependency appears to be associated with higher incomes.

One can view the Medicare physician payment reform package as a three-part policy. First, it contains a resource-based relative value scale fee schedule designed to raise fees for evaluation and management services and lower those for surgeries and procedures. This fee schedule will recognize at least some of the geographical differences in practice costs. Second, there will be volume performance standards intended to slow this rate of increase in expenditures by linking annual updates in the fee schedule to the rate of growth in service volume. Third, to ensure that reductions in Medicare payment rates do not increase beneficiaries’ financial burdens, there will be limits on the amount that physicians can...
balance bill patients above the fee schedule amounts.

In light of the specialty distribution, the fee schedule will raise average fees in rural areas. As others have noted, this occurs because of the greater prevalence of general and family practitioners, whose fees will be increased. As the difference in fees is reduced, other things being equal, the observed differences in income between urban and rural areas are likely to fall. This could improve physician availability in underserved rural communities. However, the ultimate impact on physicians’ incomes will also depend on how the fee schedule affects Medicare volume.

Rural physicians now have lower fees but a higher volume of Medicare services, as measured by patient visits, than urban physicians have. This higher volume could be composed of either more patients or more visits per patient. Dor and Holahan found that volume per beneficiary was lower in rural areas. Thus we believe that the higher Medicare volume per rural physician is the result of each physician’s seeing more patients, not providing more services per patient.

A conventional supply response among rural physicians would be for fee increases to yield a greater level of output. However, volume could fall if rural physicians reduce the numbers of “induced” services—to the extent that some are currently provided. If higher rural fees under the Medicare fee schedule lead to a reduction in rural Medicare volume per provider, the policy may not close the gap in income by as much as might be expected. On the beneficiary side, the higher copayments that will be required as a result of the higher fees may cause patients to respond by demanding less care. Some of this could be offset by the new limits on balance billing and, possibly, rural physicians’ increased willingness to accept assignment. However, recent evidence shows that the dual impact of fee increases and balance billing limits will disproportionately increase the liability of rural beneficiaries. Sixteen percent of rural beneficiaries will experience increases in out-of-pocket liability of 20 percent or more, compared with 7 percent of urban beneficiaries.

Even if there is a relatively small volume response to the fee schedule, the present difference in Medicare visits and revenues between urban and rural physicians suggests that the volume performance standards may be of greater concern in rural areas. This is because a larger share of rural physicians’ patients and revenues come from Medicare, and thus they will be subject to these potential fee adjustments more than will urban physicians. All things being equal, any overrun of a national volume performance standard that results in fee reductions will affect a greater proportion of rural physicians’ revenues.

Our findings of higher volume per rural physician, taken together with Dor and Holahan’s result of lower volume per rural beneficiary, suggest a
potential dilemma for rural physicians and their Medicare patients. If the volume performance standards are effective and all physicians try to reduce their provision of Medicare services, all providers will have to either reduce the care provided to each patient or see fewer patients. It may be difficult for rural providers to reduce services per patient below current levels. If they control volume by treating fewer patients, then the volume performance standards could exacerbate the access problems perceived in many rural areas.

Applying a uniform volume performance standard to all physicians may not be a problem if volume growth is similar in both urban and rural areas. On the other hand, if evidence shows that volume growth varies by area, variation in the uniform national standard might be equitable. Other analyses show, however, that volume growth appears to be much more systematically related to specialty or type of service. Little evidence now exists on variation in volume growth between urban and rural areas.

The effect of the limits on balance billing included in the reform package are difficult to predict. By making balance billing less attractive, the limits could increase participation and assignment in all geographic areas; physicians will no longer gain much by charging more than Medicare’s allowed amount. Some providers, however, may view these limits as reason to simply treat fewer of these “lower-priced” Medicare patients. Patients are likely to respond to the reductions in balance billing by demanding more services; from the perspective of many patients, prices will have been reduced. Increases in demand may be difficult for rural physicians to satisfy as they try to conform to volume performance standards. However, fee increases in rural areas should dampen some of this new beneficiary demand. Again, recent evidence suggests that rural beneficiaries’ demand would be dampened because of their increased out-of-pocket liability.

While conclusions from a descriptive study must be viewed cautiously, it seems that differences among urban and rural areas in Medicare volume, participation, and assignment may affect physicians’ responses to payment reform. In some cases, our analysis reveals potentially contradictory effects. For example, will the uniform volume performance standards neutralize any gains in access for rural beneficiaries that might be associated with higher fees? In addition, will the reduction in balance billing increase demand in rural areas, making it more difficult for physicians there to limit the growth in volume? These questions should be considered as further research is undertaken and payment reform policy evolves.
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NOTES


2. Because of space limitations, the full methodology, sample sizes, and regression results are not presented here. The complete methods and results are available from the authors at The Urban Institute, 2100 M Street, N.W., Washington, D.C. 20037.

3. “Patient visits” refers to the number of encounters a physician had during the last complete week of practice by setting. The survey does not elicit the number of unique patients. If the same patient returns twice to a physician’s office during the week, two patient visits have occurred. In the office setting, the number of patient visits during the week is likely to represent individual patients, whereas in the hospital, patient visits are more likely to represent multiple visits.

4. A Medicare participating physician agrees to accept assignment on all Medicare claims. Assignment refers to the beneficiary’s assignment of right to payment by Medicare to the physician. In accepting assignment, the physician is paid by Medicare and agrees not to collect from the patient more than applicable deductibles and coinsurance.


