

# Rural hospital wages

by Ann M. Hendricks

*Average fiscal year 1982 wages from 2,302 rural American hospitals were used to test for a gradient descending from hospitals in counties adjacent to metropolitan areas to those not adjacent. Considerable variation in the ratios of adjacent to nonadjacent averages existed. No statistically significant difference was found, however. Of greater*

*importance in explaining relative wages within States were occupational mix, mix of part-time and full-time workers, case mix, presence of medical residencies, and location in a high-rent county within the State. Medicare already adjusts payments for only two of these variables.*

## Introduction

Under the Medicare prospective payment system (PPS), the labor-related portion of the payment rates is adjusted for differences in wages and benefits across areas. This adjustment is made using a wage index defined for designated urban and rural labor markets. The Health Care Financing Administration (HCFA) defines an entire metropolitan statistical area (MSA) to be a single urban labor market. For rural hospitals, all rural counties in a single State are defined to be competing in one labor market. For each of these urban and labor markets, an areawide weighted average wage per hour is calculated and converted into an index for which the national weighted average is 1.0.

Executives of rural hospitals located near urban areas claim that their wages are higher than those in rural hospitals not adjacent to an MSA. The reason given is that workers living near the MSA can commute to an urban hospital and receive higher urban wages. The adjacent rural hospitals must consequently pay wages that are competitive with the higher urban wages. The executives argue that their PPS payments should not be adjusted using the lower statewide rural wage index. In this article, a test of this hypothesis of different wages is presented. The analysis uses relative wages from the HCFA survey of 1982 hospital wages and occupational mix and employment data from the American Hospital Association (AHA) annual survey of hospitals for 1982.

## A model of hospital wages

The hypothesis addressed in this article concerns the tradeoffs that hospital workers may make between wages and other aspects of their jobs. Rural hospitals proximate to urban areas claim that they compete for workers with hospitals offering urban-area wages. If the urban-rural wage difference is great enough, workers may be willing to trade a longer commute to

the big city for more income. Therefore, the adjacent rural hospitals supposedly raise their wages above those of other rural hospitals in their States to compete with urban hospitals for workers.

Within each rural labor market, however, there is a wide variation in average gross hospital wages that is attributable to other characteristics of each hospital and its workers, compared with the characteristics of the average hospital in its State. Workers may trade off wages for other desirable job aspects. For example, people may accept lower wages if they foresee rapid promotion or the opportunity to learn new skills. Similarly, a lower risk of being a victim of crime might be preferred, even if the wage is a little lower. Other aspects for which compensating differentials may be paid include:

- The training and experience required by the hospital (e.g., teaching hospitals may employ only nurses with bachelor's degrees).
- The availability of jobs outside the hospital sector in the area.
- The cost of living in an area, compared with the State's average.
- Opportunities for advancement.
- The costs of working, including commuting costs.

To test the rural administrators' claim concerning wages in adjacent counties, this wage differential study must control for interstate variation in average wages and the explanatory variables to focus only on differences within the State rural labor markets.<sup>1</sup> One method of doing this is to enter dummy variables for all but one of the States being analyzed. If this is done, the wage values should be converted to logarithms so that intra-area wage differences can be interpreted as percentage differences for each State average.

An alternative approach to using State dummy variables is employed here. Hospital wages and the relevant explanatory variables are indexed by dividing each hospital's specific values by the State averages:

$$\bar{W}_j/\bar{W}_m = \bar{W}_o + (\bar{X}_j/\bar{X}_m)\alpha + (\bar{Z}_j/\bar{Z}_m)\phi_1 + \mu' \quad (1)$$

Support for the research on which this article draws was provided by the Health Care Financing Administration (HCFA) Contract No. 500-85-0015.

Reprint requests: Ann Hendricks, Ph.D., Department of Health Policy and Management, Harvard School of Public Health, 677 Huntington Avenue, Boston, Massachusetts 02115.

<sup>1</sup>To illustrate the importance of this, suppose that rural hospitals in Alaska paid the highest rural wages and were all nonadjacent to the Anchorage MSA, and the low-wage Alabama rural facilities were all adjacent to urban areas in that State. If the study did not control for the State, the differences between Alaska and Alabama could be ascribed to adjacent-nonadjacent location.

where

$\bar{W}_j/\bar{W}_m$  = the average gross wage index of the  $j$ th hospital in the  $i$ th city of the  $m$ th labor market area, divided by the average gross wage index across all hospitals in the labor market area.

$\bar{W}_o$  = a constant.  
 $\bar{X}_j/\bar{X}_m$  = a vector of the ratios of hospital-specific characteristics (such as the mix of occupations, the proportion of part-time employees) to the average, across the  $m$ th labor market area.

$\bar{Z}_i/\bar{Z}_m$  = a vector of the ratios of community-specific characteristics (e.g., the cost of living) to the average, across the  $m$ th labor market area.

$\mu$  = an error term, reflecting unexplained interhospital differences.

Analyses that follow compare rural wage differentials within each State (as HCFA currently defines rural labor markets) and also within the rural subset of each Bureau of Economic Analysis (BEA) economic activity area. (The Bureau of Economic Analysis has defined 183 economic areas that group urban counties with their economically related rural counties, without regard for State boundaries. These areas are potentially an alternative basis for defining labor markets.) The hypothesis to be tested is whether rural hospitals adjacent to urban areas pay significantly higher wages than those distant from urban areas. In each case, when significant differences are found, explanations for them are sought in hospital-specific characteristics in the model.

## Data sources and variable definitions

Four data sources were merged to construct an analytic file:

- 1984 HCFA Hospital Wage Survey (1982 data).
- HCFA Impact File (1981) for case mix and residents per bed.
- American Hospital Association 1983 Annual Survey of Hospitals (1982 data).
- Area Resource File (1985).

Hospitals not covered by PPS, such as psychiatric, rehabilitation, alcohol or drug treatment, children's, and long-term care hospitals, were excluded from the file.

Two dependent variables were constructed from the gross total salaries and paid hours for 1982 for hospitals in the 1984 HCFA wage survey. The first variable was the ratio of each hospital's average hourly wage to the statewide rural average. The second was the ratio of each hospital's average to the average for the BEA economic area in which the hospital was located.

The average indexes for nonadjacent counties are lower than those in adjacent counties in a majority of

States. In fact, the mean ratio of the adjacent index to nonadjacent index across States is 1.03. However, the standard deviation is 0.12, and the range is from 0.78 in Colorado to 1.58 in Massachusetts. Although, on average, adjacent wage indexes are higher than those for nonadjacent areas, this is not the case for 16 States (Table 1). Further, the ratios vary widely within the 27 States for which it exceeds 1.0.

High wages in hospitals that are not adjacent to urban areas may be explained by the mix of employees (by occupation and by part-time status) in those hospitals. This is especially plausible if an urbanized area that does not qualify as an MSA contains a large hospital with teaching activity and/or severe cases. Similarly, some nonadjacent hospitals may be located in resort areas and may have to pay higher wages because of the inflated costs of living in those towns. Examples of this include the ski regions of Colorado and certain oceanfront communities in South Carolina.

A variable was created that separated adjacent rural hospitals from those not adjacent to an MSA according to the Area Resource File. These distinctions were verified by inspection of maps for the 50 States. Rural hospitals in counties bordering an MSA were coded as "adjacent-rural," and the remaining ones were labeled "nonadjacent."

One problem with the classification is that the adjacent-nonadjacent designations do not capture the actual distance from an MSA border or the nearest city hospital, which are better measures of competition with an urban hospital labor market. Some hospitals in "adjacent" rural counties may be farther from urban areas (because the county is very large) than hospitals in some "nonadjacent" counties. Although counties in the West tend to be much larger in area than those east of the Rocky Mountains, within most States they are more uniform. Analyses for two States in which road miles to an MSA border were used to measure wage competition gave results consistent with those presented here. This is a greater issue across States than it is within most States, however.

The AHA annual survey contains counts of full-time and part-time workers. Hospitals in counties adjacent to MSAs rely somewhat less on part-time employees (18 percent versus 20 percent), implying that compensation for full-time workers is a larger percentage of adjacent hospitals' total costs. Because full-time employees are compensated with more fringe benefits and perhaps higher hourly wages, greater dependence on full-time workers should raise the hourly average for adjacent rural hospitals.

One explanation of the higher salaries in counties proximate to MSAs is the mix of employee skills. The proportion of higher paid employees was proxied using a number of job categories reported in the 1982 AHA hospital survey. These included all administrators, registered nurses (RNs) (not licensed practical nurses), pharmacists, medical technologists, dietitians, radiology technologists, occupational therapists, and physician therapists, but not their

**Table 1**  
**Ratios of adjacent rural wage indexes to nonadjacent wage indexes, by State:**  
**United States, 1982**

States in which wage index of adjacent rural counties is greater than that in nonadjacent counties				States in which wage index of adjacent rural counties is less than or equal to that in nonadjacent counties			
State	Ratio of wage indexes	Number of adjacent hospitals	Number of nonadjacent hospitals	State	Ratio of wage indexes	Number of adjacent hospitals	Number of nonadjacent hospitals
Alabama	1.06	57	20	Arizona	0.92	19	8
California	1.06	54	7	Arkansas	0.98	29	48
Delaware	1.18	1	3	Colorado	0.78	13	35
Florida	1.24	35	5	Kansas	0.98	28	97
Georgia	1.01	47	50	Michigan	0.96	29	53
Idaho	1.09	7	36	Mississippi	0.99	24	77
Illinois	1.05	55	35	Missouri	0.93	32	46
Indiana	1.10	54	6	New York	0.95	53	7
Iowa	1.01	38	65	North Dakota	0.96	15	29
Kentucky	1.01	24	52	Oregon	0.98	27	15
Louisiana	1.19	66	9	South Carolina	0.89	35	5
Maryland	1.02	4	3	South Dakota	0.93	4	48
Massachusetts	1.58	4	2	Washington	0.98	34	15
Minnesota	1.02	58	58	West Virginia	0.93	21	26
Montana	1.01	9	48	Wisconsin	0.97	58	19
Nebraska	1.02	14	71	Wyoming	0.98	9	17
Nevada	1.01	9	2				
New Mexico	1.09	7	24				
North Carolina	1.04	44	36				
Ohio	1.16	63	5				
Oklahoma	1.06	55	31				
Pennsylvania	1.06	40	9				
Tennessee	1.03	40	38				
Texas	1.09	138	89				
Utah	1.04	4	10				
Virginia	1.04	28	19				

NOTES: Ratio of wage indexes is the wage index of adjacent hospitals divided by the wage index of nonadjacent hospitals. New Jersey and Rhode Island have no rural hospitals by the Health Care Financing Administration definition. Connecticut and Hawaii have no rural areas that are not adjacent to a metropolitan statistical area (MSA) by our definition. Alaska, Maine, and New Hampshire have no hospitals in rural areas that are adjacent to MSAs in this data set.

SOURCE: Health Care Financing Administration (HCFA), Bureau of Policy Development: Data from the 1984 HCFA Hospital Wage Survey.

assistants or aides. Speech pathologists, audiologists, medical social workers, and psychologists were also included in the numerator of the occupational-mix variable. Division of nonmedical personnel into high- and low-wage categories was not possible. The variable measuring the relative mix of the previously mentioned highly paid full-time equivalents (FTEs) to the total hospital FTEs was a ratio varying from zero to one. This proportion was only slightly higher on average (0.26 versus 0.25) for adjacent hospitals and so does not appear to offer an easy explanation of the salary differences. Nevertheless, both of these factors are held constant in the regressions reported later.

### Explaining differences in rural wages

Equation (1) was estimated for rural hospitals using the following explanatory variables:

- The hospital's proportion of highly skilled FTEs (AHA data).
- The hospital's proportion of part-time FTEs (AHA data).
- The hospital's ratio of medical residents to beds (HCFA Impact File).
- The hospital's case-mix index (HCFA Impact File).
- The median gross rent of the county in which the hospital was located (Area Resource File).

These five variables were indexed by dividing each hospital's value by the average value for the statewide rural labor market (using the HCFA current definition) or for the rural hospitals within the hospital's BEA economic area.

Two sets of regressions were estimated. The dependent variable was the ratio of each hospital's gross average wage to the gross average of either its current HCFA rural labor market (the non-MSA counties within each State) or an alternative using the rural counties of each BEA-defined economic area. The regressions were run on all rural hospitals except those in Alaska, Hawaii, Connecticut, Maine, and New Hampshire. These five States were excluded because they have either no adjacent or no nonadjacent hospitals.

Five stepwise regressions explaining wage differentials within the HCFA current rural labor markets are presented in Table 2. The first uses only the hospital's location in a county adjacent or nonadjacent to an MSA to explain wage variation within each rural area. The constant term is 0.956, indicating that, on average, rural hospitals not adjacent to MSAs have wages that are 96 percent of the statewide rural average. The coefficient for adjacent hospitals is 0.004, indicating an average wage that is 0.4 percent higher than that in nonadjacent

Table 2

**Coefficients in the regression of the ratio of each hospital's gross average wage to statewide rural average wage against various explanatory variables, using current Health Care Financing Administration labor markets: United States, 1982**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5 <sup>1</sup>
Constant	*0.956	*0.796	*0.512	*0.415	*0.460
Location in a county adjacent to an MSA <sup>2</sup>	0.004	0.003	0.002	-0.001	-0.001
Proportion of high-pay FTEs <sup>3</sup> to average proportion		*0.186	*0.165	*0.131	*0.129
Proportion of FTEs that are part time to average proportion		*-0.026	*-0.022	*-0.022	*-0.019
Hospital case-mix index to average case mix			*0.301	*0.218	*0.211
Residents per bed to average			*0.001	*0.001	*0.002
Median gross rent of county to average median gross rent				*0.217	*0.219
R <sup>2</sup>	.001	0.09	0.11	0.15	0.08

\* Significant at 1-percent level.

<sup>1</sup>This model was constrained so that the sum of the coefficients plus the intercept summed to one. This constraint was imposed for consistent estimation, because the error terms are not linearly independent.

<sup>2</sup>MSA is metropolitan statistical area.

<sup>3</sup>FTE is full-time equivalent.

NOTES: Nonadjacent hospitals are in the constant. For adjacent hospitals, the dummy value of 1.0 is divided by the proportion of the State rural hospitals that are adjacent to MSAs. Thus, in Mississippi, adjacent hospitals are given a value of 4 (being near an MSA is a rare event), but in Wisconsin, they have a value of about 1.3 (being far from an MSA is the rare event). Number of hospitals used is 2,302.

SOURCE: Health Care Financing Administration, Bureau of Policy Development: Data from the 1984 HCFA Hospital Wage Survey; American Hospital Association: Data from the 1983 Annual Survey of Hospitals.

counties. This difference is not statistically significant. It may seem paradoxical that the constant terms plus the adjacent-hospital dummy coefficient do not exceed 1.0, implying that all rural wage rates are below the statewide average. The seeming discrepancy arises because the PPS wage index is weighted by hours worked in each hospital, but the mean values represented by the constant and coefficient in Table 2 weight each hospital equally, regardless of the number of FTEs or hours worked. Low-wage hospitals tend to have fewer FTEs; therefore, a hospital-weighted average is lower than an hour-weighted one.

The second column controls for the hospital's occupation mix and the proportion of part-time employees. A hospital's location may proxy these worker characteristics: Being near an urban area is associated with having more workers in the high-wage categories and a lower proportion of part-time employees. Both of these staff characteristics have highly significant effects on relative wage levels within State rural areas. An increase in the relative proportion of highly paid FTEs from 1.0 (the State average) to 1.1 would raise the relative within-State wage index by 0.0186 percentage points, say from 0.98 to 1.00, the statewide average wage. A similar increase in the relative proportion of FTEs employed part time would lower the hospital's average hourly wage by 0.0026 relative to the State average. The *R*-square is low (0.09), but it should be kept in mind that this is the additional variation explained within each State rural area. Because roughly one-half of the variance in wages is explained by State-specific factors (being in Mississippi rather than Massachusetts), the *R*-square of 0.09 for the model in Table 2 is

equivalent to about 0.6 in a model that includes cross-state variation.

In column 3, one can see the effects of controlling for the relative case-mix index and teaching activity of each hospital. This model was estimated to see if teaching or the mix of cases had effects on wages separate from that of the employee occupational mix. Although a hospital treating more complex cases may require a higher proportion of highly skilled labor, it may also use workers at every level who are more experienced or have more education. This would contribute to higher relative wages within occupation. Indeed, the measure of relative case mix had a large (0.301) and highly significant effect on hospitals' relative wages, even holding occupational mix constant. This measure was correlated with the employee occupational mix and the hospital's teaching status, however. The latter had a small but highly significant effect on wages separate from the mix of occupational groups and case mix.

The only community-level variable included was the relative county median gross rent. Per capita incomes and population density were too highly correlated with rents and lacked the theoretical justification to be included in the model. Relative rents have a large and highly significant effect on wages. Controlling for relative rent levels also changed the sign of the coefficient for the location variable but did not make it statistically significant.

In model 5, the regression coefficients are constrained to add to one by the SAS regression estimation procedure. This constraint was added because the disturbance terms in equation (1) are not linearly independent. If the dependent variables ( $W_j/W_m$ ) are summed across all rural hospitals in a

State, the result is 1.0. Consistent estimation requires that this restriction be imposed prior to estimation (Theil, 1971). Only the last model is so constrained, because there is no logical reason for a subset of the explanatory variables to equal 1.0.

Variable by variable, there is no significant difference between the constrained model (5) and the unconstrained model (4). Differences occur in the third decimal point. The *R*-square is reduced by one-half, however.

What do these results indicate about the wages of adjacent rural hospitals compared with their rural neighbors? Within the current HCFA rural labor markets, hospitals in counties adjacent to urban areas pay wages that are statistically the same as those in nonadjacent hospitals.

This result is unchanged when several hospital-specific differences are accounted for. However, the combination of adjusting wages for occupational mix and the use of part-time employees should significantly ameliorate the HCFA relative wage adjustment after the next wage survey. A State-level rural wage index adjusted for occupational mix and part-time workers will likely address more than 60 percent of the variance in wage costs among rural hospitals. In addition, the case-mix and teaching adjustments appear to be directly correlated with wages. Therefore, a corrected wage measure should reduce those adjustments somewhat.

What would happen to rural PPS payments if wage indexes were calculated separately for adjacent and nonadjacent counties within each State? In general, for the high-wage hospitals, very little would change. High-wage hospitals are usually big hospitals. Therefore, the current PPS rural wage indexes, which are weighted by total salaried hours, are already generally close to the separate wage index (either adjacent or nonadjacent) that includes these high-wage hospitals. For example, in Alabama, Florida, or Virginia, where adjacent wages are higher than nonadjacent wages, a separate wage index for adjacent-only hospitals would raise their per case payments by \$14.21 to \$18.63 (for a case with a diagnosis-related group weight of 1.0 in 1985), or only 0.7 to 0.9 percent of the total payment. In Massachusetts, adjacent hospitals would gain 3.9 percent. In Colorado, where nonadjacent wages are higher, a separate wage index would raise their payments by 3.8 percent (\$84 in 1983 dollars for a case weighted 1.0).

For the rural group with the lower wage index, generally made up of smaller hospitals, the change would be more marked. In Alabama and Virginia, for instance, the nonadjacent hospitals would lose 2.1 to 2.4 percent per payment. However, a nonadjacent wage index in Florida would reduce those hospitals' payments by 14.6 percent; in Colorado, there would be a 10.9-percent drop; and in Massachusetts, a 25.4-percent reduction per case.

Any change in the index will cause some hospitals to gain and others to lose. These percentages illustrate the size of the effect of a wage index change on

groups of hospitals. The gains or losses for individual hospitals will vary more.

This stage of the analysis confirms that there is a significant difference in wages within the rural hospital market according to a hospital's location. However, it is partly explained by hospital staffing practices and by the relative costs of living faced by workers. Perhaps a labor market definition that captures differences in living costs or other economic activity may correct this possible cause of wage variation. One such candidate to effect a correction is a labor market defined as the rural area within a BEA economic activity area. These markets may be more homogeneous with respect to living costs and wages than the HCFA current rural labor markets.

There are 183 BEA economic activity areas. The question to be answered by this analysis is: Do adjacent hospitals pay significantly higher wages than nonadjacent rural hospitals even within the same BEA-defined labor market? As indicated in Table 3, the answer appears to be no.

In Table 3, one can see the regression coefficients for the same five models as in Table 2, but the wages are defined for BEA economic areas instead of the current HCFA rural labor markets. Hospitals in counties adjacent to MSAs pay wages that are not significantly higher than the other rural counties in their economic areas. Holding other hospital or community characteristics constant, in models 2 through 4, does not change this result. In addition, most of the coefficients are similar to those found in Table 2. The coefficient for rent was greatly reduced compared with the results for current labor markets (although it was still highly significant).

These results and the lower *R*-square may be the result of the greater homogeneity of hospitals and their locations within BEA economic areas. For example, one-quarter of the areas contain either no counties adjacent to MSAs or none that are not adjacent. The wage variation in those areas cannot be explained by location relative to urban areas. Furthermore, nonadjacent rural hospitals are smaller, on average, with a lower case-mix index and are less likely to have teaching residencies.

The conclusion drawn from Table 3 must be that a redefinition of rural hospital labor markets using BEA economic areas will not reduce the adjacent-nonadjacent rural wage differential for the 135 BEA areas with both adjacent and nonadjacent rural counties in them. However, that concern may be misplaced, because those nonadjacent hospitals are much fewer in number, are smaller in size, and do not affect the BEA-based wage index as greatly as do the large adjacent hospitals. Therefore, the BEA-based indexes reflect the higher adjacent wages more and will generally increase the PPS adjustments for those hospitals, compared with an index for all adjacent counties in the State, and will, at the same time, give a boost to low-wage hospitals in the same BEA areas.

For example, in Florida, the majority of the adjacent areas are in the south; the nonadjacent areas are primarily in the western part of the State. The

**Table 3**

**Coefficients in the regression of the ratio of each hospital's gross average wage to areawide rural average wage against various explanatory variables, using Bureau of Economic Analysis economic activity areas: United States, 1982**

Variable	Model 1	Model 2	Model 3	Model 4	Model 5 <sup>1</sup>
Constant	*0.963	*0.829	*0.616	*0.557	*0.594
Location in a county adjacent to an MSA <sup>2</sup>	0.004	0.003	0.003	0.001	0.001
Proportion of high-pay FTEs <sup>3</sup> to average proportion		*0.159	*0.142	*0.122	*0.120
Proportion of FTEs that are part time to average proportion		*-0.024	*-0.021	*-0.021	*-0.019
Hospital case-mix index to average case mix			*0.226	*0.176	*0.170
Residents per bed to average			*0.001	**0.001	*0.001
Median gross rent of county to average median gross rent				*0.131	*0.132
R <sup>2</sup>	0.001	0.07	0.08	0.10	0.04

\* Significant at 1-percent level.

\*\* Significant at 5-percent level.

<sup>1</sup>This model was constrained so that the sum of the coefficients plus the intercept summed to one. This constraint was imposed for consistent estimation, because the error terms are not linearly independent.

<sup>2</sup>MSA is metropolitan statistical area.

<sup>3</sup>FTE is full-time equivalent.

NOTES: Nonadjacent hospitals are in the constant. For adjacent hospitals, the dummy value of 1.0 is divided by the proportion of the State rural hospitals that are adjacent to MSAs. Thus, in Mississippi, adjacent hospitals are given a value of 4 (being near an MSA is a rare event), but in Wisconsin, they have a value of about 1.3 (being far from an MSA is the rare event). Number of hospitals used is 2,302.

SOURCE: Health Care Financing Administration, Bureau of Policy Development: Data from the 1984 HCFA Hospital Wage Survey; American Hospital Association: Data from the 1983 Annual Survey of Hospitals.

BEA-based indexes capture this difference: The indexes for the peninsula are 0.91 and 0.95 (compared with a current wage index of 0.88); the westernmost counties are indexed at 0.63. If the average hourly wages represented by each of the three rural wage indexes (current, adjacent-nonadjacent, or BEA-based) are compared with each hospital's own average hourly wage, the net effects are surprisingly similar across the three indexes. The BEA-based index is perhaps the most egalitarian. Seventy-five more hospitals gained or lost less than 5 percent from this wage index compared with the other two wage indexes (current definition or an adjacent-nonadjacent division). Further, the average amount of the gain or loss was not much affected by which index was used, except for the group gaining or losing only 5 percent or less. Here, the average gain was cut to one-fourth the size of the average under either the current wage index or an adjacent-nonadjacent one.

## Conclusions

The previous analyses have confirmed that there is no statistically significant higher wage paid in adjacent rural hospitals compared with those not adjacent to urban areas. However, defining a wage index for each BEA area does somewhat better than either currently defined rural areas or an adjacent-nonadjacent split in reducing the number of big winners and losers, with respect to wage adjustments.

These are not, in themselves, reasons for choosing one of these wage indexes over another in an attempt to more accurately distinguish the labor markets faced by adjacent and nonadjacent rural hospitals. Redefinition would not produce a large gain for high-wage hospitals, but it could significantly reduce

payments to small, rural, low-wage facilities. Because we do not thoroughly understand the causes of the wage differentials, we may be overlooking better alternatives for PPS wage adjustments than any of these tried to date.

The characteristics of some of the communities of high-wage hospitals suggest that they should be considered urban. For example, for the BEA areas with no MSA in them, consideration should be given to designating the largest city in each as a separate labor market and to computing wage indexes for each of these cities separate from the indexes for the rest of the area. Although this would increase these hospitals' ability to pass through their labor costs, it would more accurately reflect labor differences that are not adequately captured by BEA or adjacent-nonadjacent designations.

## Acknowledgments

The author appreciates helpful comments from Philip Cotterill, Jerry Cromwell, Martin Gaynor, Greg Pope, and several anonymous reviewers on earlier drafts.

## References

- Health Care Financing Administration, Office of Research and Demonstrations: Data from the HCFA Impact File, 1981.
- Health Resources and Services Administration: Area Resource File. HRP-09-06618. Rockville, Md. Public Health Service, Aug. 1985.
- Theil, H.: *Principles of Econometrics*. Santa Barbara, Calif. John Wiley and Sons Inc., 1971.