CHAPTER 6

An alternative method to compute the wage index

RECOMMENDATIONS

6A The Congress should repeal the existing hospital wage index statute, including reclassifications and exceptions, and give the Secretary authority to establish new wage index systems.

COMMISSIONER VOTES: YES 15 • NO 0 • NOT VOTING 0 • ABSENT 2

6B The Secretary should establish a hospital compensation index that:

- uses wage data from all employers and industry-specific occupational weights,
- is adjusted for geographic differences in the ratio of benefits to wages,
- is adjusted at the county level and smooths large differences between counties, and
- is implemented so that large changes in wage index values are phased in over a transition period.

COMMISSIONER VOTES: YES 15 • NO 0 • NOT VOTING 0 • ABSENT 2

6C The Secretary should use the hospital compensation index described in recommendation 6B for the home health and skilled nursing facility prospective payment systems and evaluate its use in the other Medicare fee-for-service prospective payment systems.

COMMISSIONER VOTES: YES 15 • NO 0 • NOT VOTING 0 • ABSENT 2

CHAPTER 6

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Chapter summary

In the Tax Relief and Health Care Act of 2006 (TRHCA), the Congress mandated that MedPAC submit a report on a revision of the wage index by June 30, 2007, including Commission recommendations on alternatives for computing the wage index. The Secretary then has to consider MedPAC's recommendations and include in the fiscal year 2009 inpatient prospective payment system (IPPS) proposed rule one or more proposals to revise the wage index. The TRHCA also requires that CMS consider specific issues of concern to the Congress such as eliminating exceptions, minimizing variation in the wage index across county borders, and using the hospital wage index in other settings.

In this chapter, we explore a new method for calculating wage indexes for hospitals and other sectors that addresses the Congress's concerns. It is based on wage data from the Bureau of Labor Statistics and the Census Bureau and on benefits data from the provider cost reports submitted to CMS. The MedPAC wage index isolates differences in wage rates that are solely due to geography and is not highly influenced

In this chapter

- Current approach
- New approach
- Results
- Wage index differences across sectors
- Caveats
- Conclusion
- Additional technical information on constructing a compensation index from BLS data

by an individual hospital's choices about the type of employees to hire or the type of services to offer.

The current hospital wage index adjusts Medicare payments for differences in reported hospital wages across geographic areas in the United States. By law, CMS calculates the index using data only from hospitals paid under Medicare's IPPS. It uses self-reported data in hospital cost reports. However, it uses the index to adjust payments for other sectors such as home health and skilled nursing facilities (SNFs), even in counties without IPPS hospitals.

Over the years, the Congress and the Secretary have created exceptions to the calculated wage index that now change the calculated values for about one-third of IPPS hospitals. These exceptions can be overlapping and lead to nonintuitive results. The new method eliminates the need for the many exceptions by limiting the extent of the differences between adjacent areas. It is also less volatile from year to year than the current index and does not require a separate survey to untangle the effect of occupational mix differences from wage differences—which is an inherent problem in the current system.

The Commission recommends first that the Congress should repeal the existing hospital wage index statute, including reclassifications and exceptions, and give the Secretary authority to establish new wage index systems.

Recommendation 6A

COMMISSIONER VOTES:
YES 15 • NO 0 • NOT VOTING 0 • ABSENT 2

The Congress should repeal the existing hospital wage index statute, including reclassifications and exceptions, and give the Secretary authority to establish new wage index systems.

Second, the Commission recommends that the Secretary should use this new authority to establish a hospital compensation index that:

- uses wage data representing all employers and industry-specific occupational weights,

- is adjusted for geographic differences in the ratio of benefits to wages,
- is adjusted at the county level and smooths large differences between counties, and
- is implemented so that large changes in wage index values are phased in over a transition period.

Recommendation 6B

The Secretary should establish a hospital compensation index that:
- *uses wage data from all employers and industry-specific occupational weights,*
- *is adjusted for geographic differences in the ratio of benefits to wages,*
- *is adjusted at the county level and smooths large differences between counties, and*
- *is implemented so that large changes in wage index values are phased in over a transition period.*

COMMISSIONER VOTES:
YES 15 • NO 0 • NOT VOTING 0 • ABSENT 2

Because it uses the same underlying data for all settings, the method can easily be tailored to SNFs and home health agencies. However, we find that the SNF, home health agency, and hospital wage indexes under the new approach are highly correlated. Therefore, the Commission also recommends that the Secretary should use that hospital compensation index for the home health and SNF prospective payment systems and evaluate its use in the other Medicare fee-for-service prospective payment systems. ■

Recommendation 6C

The Secretary should use the hospital compensation index described in recommendation 6B for the home health and skilled nursing facility prospective payment systems and evaluate its use in the other Medicare fee-for-service prospective payment systems.

COMMISSIONER VOTES:
YES 15 • NO 0 • NOT VOTING 0 • ABSENT 2

Introduction

The role of the wage index in Medicare prospective payment systems is to adjust payments for the differences in wage rates across geographic areas. The basic idea is that if it costs more to hire a nurse in New York City than it does in rural Alabama, then payments should reflect that difference because area labor costs are beyond a health care provider's control. The text box shows how CMS uses the wage index to calculate payments for hospitals.

Computing a wage index requires:

- determining geographic labor market areas,
- determining the underlying wage level in those markets for the relevant occupations, and
- comparing those levels with the national average to derive an index value.

The market areas in the current system are metropolitan statistical areas (MSAs), which usually include a city and its surrounding suburbs, and a residual called the statewide rural area, which includes all counties in the state that are not in MSAs.[1] A system that adjusts for geographic differences in labor input costs should isolate differences in wage rates that are solely due to geography. An index should reflect overall market conditions and not be highly influenced by an individual hospital's choices about the types of employees to hire or the types of services to offer.

Calculation of base payment in fiscal year 2007

CMS computes the hospital base payment for inpatient prospective payment system (IPPS) hospitals by splitting the base rate into a labor-related share and a non-labor-related share and then multiplying the labor-related share by the wage index for the geographic area. In fiscal year 2007, the hospital wage index ranged from about 1.56 to 0.74. The base payment for hospitals in these areas is calculated as shown below.

Base payment

= [(base rate) × (labor share) × (wage index)]
+ [(base rate) × (1 – labor share)]

For fiscal year 2007, all hospitals paid under the IPPS have the same base rate, $4,874. The wage indexes for the areas with the highest and lowest wage indexes in the country are as shown in Table 6-1. CMS estimated the labor share to be 0.697 across the nation using Medicare cost report data, and CMS uses that figure for the area with the highest wage index. However, the Congress set the labor share at 0.62 for hospitals with wage indexes less than or equal to 1; therefore, CMS uses that amount for the area with the lowest wage index. Because areas with a wage index less than or equal to 1 have a smaller labor share, the differences in base payments do not fully reflect the differences in wage indexes. CMS calculates the labor-related base payment by multiplying the base rate, the labor share, and the wage index, and it calculates the non-labor-related base payment as (1 minus the labor share) times the base rate; the sum of those two columns is the base payment. That amount ranges from about $4,079 for hospitals with the lowest wage index to about $6,783 for hospitals with the highest wage index. ■

TABLE 6–1 How the wage index affects the base payment for hospitals, 2007

Wage index area	FY07 base rate	Labor share	Wage index	Labor-related portion	Non-labor-related portion	Base payment
Highest	$4,874	0.697	1.5617	$5,306	$1,477	$6,783
Lowest	4,874	0.620	0.7368	2,227	1,852	4,079

Note: FY (fiscal year).

Source: Final FY07 wage indexes and payment factors from *Federal Register* 71, no. 196 (October 11, 2006): 59890.

Exceptions to the current wage index

Lugar counties: Entire counties may be reclassified to an adjacent metropolitan statistical area (MSA) if they are adjacent to more than one MSA and, taken together, the commuting pattern to those MSAs would classify them to a single MSA under Office of Management and Budget (OMB) rules. For example, if 13 percent of the workers in a county commute to MSA 1 and another 13 percent commute to MSA 2, the sum of those commuting would be 26 percent. Under OMB rules, 25 percent of workers must commute to a single MSA for a county to be part of that MSA; thus, the county would qualify as a Lugar county.

Medicare geographic classification review board decisions: Hospitals may request reclassification to an adjacent labor market area if they meet conditions of geographic proximity and comparable wage costs:

- Close geographic proximity is defined as being located within 15 miles (if urban) or 35 miles (if rural) from the border of the area to which they seek to be reassigned. Proximity may also be demonstrated if at least 50 percent of the hospital's employees reside in the reassigned area.

- Comparable wage costs are defined as having an average hourly wage rate at least 108 percent (if urban) or 106 percent (if rural) of the average hourly wage in their actual labor market location, and having an average hourly wage at least 84 percent (if urban) or 82 percent (if rural) of the average wage rate in the area to which they seek to be reassigned. Comparable wage costs are based on weighted three-year average hourly wages.

Sole community hospitals and rural referral centers are not required to meet the proximity criteria. In addition, hospitals that are currently classified or have ever been classified as rural referral centers are not required to meet the 106 percent criterion (they can reclassify even if their wages are not higher than their regional average).

Hospitals that do not meet the geographic reclassification regulations have also been reclassified:

- The Section 508 reclassifications were created in the Medicare Prescription Drug, Improvement, and Modernization Act of 2003; they now expire at the end of fiscal year 2007.

Section 401: Section 401 allows hospitals to be classified for wage index purposes as rural although they are in an urban area.

Special exceptions: Special exceptions are reclassifications allowed at the discretion of the Secretary for certain providers that previously qualified under rules for group (countywide) reclassifications, where statutory changes related to other prospective payment system provisions would otherwise have disqualified these providers from reclassification. These exceptions were implemented in fiscal year 2005 (CMS 2004).

Outcommuting adjustment: The outcommuting adjustment allows wage indexes for counties in lower wage index areas to be blended with higher wage index areas in proportion to the number of county residents who are hospital workers and who commute to those higher wage index areas.

Rural floor:

- The rural floor exception requires that any MSA wage index in a state be equal to or greater than the statewide rural wage index in that state.

- The rural floor exception was extended to states without rural areas and an imputed rural floor was created for those states.

Hold harmless: Under the hold-harmless provision, hospitals now in rural but formerly in metropolitan markets are allowed to retain former metropolitan designation for three years, fiscal years 2005–2007. ■

Therefore, the sample of wages used to construct the index should come from all employers of similar workers in the market.

First, we describe the approach currently used in the hospital wage index, which is part of both hospital inpatient and outpatient prospective payment system (PPS) payment formulas; then we describe an alternative approach for computing a hospital wage index and how to extend that approach to other sectors such as skilled nursing facilities (SNFs) and home health agencies.

Current approach

The current hospital wage index adjusts payments for differences in hospital-reported average wages across geographic areas in the United States. By statute, it should adjust for area differences in hospital wage levels by a factor that reflects the relative hospital wage level in the geographic area of the hospital compared with the national average hospital wage level. It is updated on the basis of a survey conducted by the Secretary of the wages and wage-related costs of inpatient prospective payment system (IPPS) hospitals (see text box, pp. 151–152, for text of 42 U.S.C. 1395ww(d)(3)(E)). In practice, it is based on data hospitals reported four years prior in their Medicare IPPS cost reports. The reports include detailed instructions on which employees, what lines of business, and what elements of compensation—including salaries and wage-related costs—to include. Audits show the results can sometimes be inaccurate (OIG 2007). Areas with only one or two hospitals may also see volatility in the wage index if wages change suddenly—for example, because of a new labor agreement or because of errors in reporting costs and hours (OIG 2007).

Exceptions

The basic wage index system, which uses MSAs and statewide rural areas as its labor markets, can result in large differences between adjoining geographic areas. Because a hospital near a border may consider it inequitable that its wage index value is lower than that of a nearby hospital, over the years numerous exceptions to the basic calculation have been incorporated into the system that permit hospitals to have their payments adjusted by a higher wage index value. Those exceptions now increase the calculated wage index for more than one-third of IPPS hospitals (Table 6-2, p. 130). Each type of exception is explained in the text box (opposite page).

Adjudicating this exception process and maintaining a wage index system with so many exceptions is burdensome to CMS. The text box (p. 131) shows that the numerous exceptions and the interactions among them create a number of troubling anomalies in the current system. Dalton and colleagues have compiled a history of the wage index legislation and exceptions (Dalton et al. 2007).

Occupational mix

A second problem with the Medicare wage index relates to the occupational mix across hospitals. The average wage might be higher in one hospital than another not because of differences in underlying wages but because of differences in the share of higher or lower wage staff employed by one hospital relative to another. Payments to a hospital should not increase because one hospital chooses to use a mix of labor that is higher cost than another. For example, if one hospital chooses to use information technology (IT) specialists and invest in an IT system instead of employing many billing clerks, that choice should not change its wage index. In addition, if a higher skill mix is a result of caring for higher intensity patients, the additional costs should be reflected in the case mix for the hospital, not in the wage index. Medicare's diagnosis related group (DRG) system captures differences in costs—including those associated with the mix of staff. Hospitals with more high-cost DRGs (a higher case mix) receive higher payments.

Historically, the wage index reflected a hospital's average wage without adjusting for the skill level of its employees. In an attempt to correct this problem, the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 mandated that CMS remove the effect of differences in occupational mix from the index. In fiscal year 2005, CMS introduced an occupational mix adjustment to control for the effect of skill level on the wage index. Because of uncertainties about the data, the method, and the impacts on hospitals, CMS limited the adjustment to 10 percent of the wage index.

CMS introduced a new system to survey hospitals for their occupational mix in 2006 and was planning to adjust for occupational mix using data from the survey beginning in fiscal year 2008. However, a court ruling, *Bellevue Hospital Center v. Leavitt*, 443 F.3d 163 (2nd Cir. 2006), required that the wage index be adjusted 100 percent for the effect of occupational mix in fiscal year 2007 using

TABLE 6–2

Exceptions to the wage index in fiscal year 2007

	Number of hospitals			
	Urban	Rural	Total	Percent of total
Total inpatient prospective payment system hospitals	2,590	1,005	3,595	100%
Labor market reclassifications and special exceptions:				
Lugar counties ("deemed urban," since 1988)	49	N/A	49	1
MGCRB decisions, standard criteria	280	358	638	18
MGCRB decisions (MMA Section 508 special appeals)	81	27	108	3
Urban to rural (BIPA Section 401 providers)	30	N/A*	30	1
"Special exceptions" by the Secretary	13	5	18	1
Subtotal, all reclassified and special exceptions	453	390	843	23
Outcommuting adjustments (MMA Section 505)	133	91	224	6
Rural floor index				
Original: Providers in states with rural markets	216	N/A**	216	6
Imputed: Providers in "all urban" states	40	N/A	40	1
"Hold-harmless" providers from MSA-to-CBSA change	N/A	46	46	1
Total hospitals with exceptions and adjustments	842	481	1,323	37

Note: N/A (not applicable), MGCRB (Medicare Geographic Classification Review Board), MMA (Medicare Prescription Drug, Improvement, and Modernization Act of 2003), BIPA (Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000), MSA (metropolitan statistical area), CBSA (core-based statistical area). Total is number of hospitals with at least one exception; hospitals may qualify for more than one. Numbers may not sum to total due to rounding.
*Five providers in this category were identified in the hospital impact file as rural (presumed error; placed in urban column).
**Two providers in this category were identified in the hospital impact file as rural (presumed error; placed in urban column).

Source: Dalton et al. 2007.

data from the new survey. The latest survey collects salaries and hours for hospital employees and contractors but only adjusts for differences in the mix of nursing personnel.

This limited occupational mix adjustment had a small effect on most hospitals in 2007. The occupational mix adjustment differentiates between management RNs, other RNs, licensed practical nurses (LPNs), nurse aides, and medical assistants. It does not account for differences in the mix of other occupations. An occupational-mix-adjusted wage index was published in October 2006 after the final rule. The occupational mix adjustment resulted in the wage index increasing in 47 percent of the 386 urban wage index areas and decreasing in about 52 percent (4 areas had no change). The greatest urban increase was 8.4 percent and the greatest decrease was 6.0 percent. In the 47 rural areas, 70 percent saw increases and 30 percent saw decreases. The greatest rural increase was 3.2 percent and the greatest decrease was 2.7 percent.

Circularity

The current system relies solely on hospital-reported data and hence is prone to the problem of circularity. For example, hospitals that successfully moderate increases in hourly wages relative to the national average increase will see a decrease in their wage index. They will then receive lower payments, which may create pressure to exert even tighter control over costs. (The magnitude of the pressure depends on the overall financial condition of the hospital.) If hospitals succeed at keeping wage increases below the national average again, their wage index could decrease still further. This is particularly a problem in a market area with few hospitals where any idiosyncratic characteristic of the hospital (e.g., labor mix or unusual labor agreements) can

The system of wage index exceptions causes anomalies in wage index values

The current wage index system has become laden with exceptions, distorting area wage indexes. For example, the rural floor exception is built on the faulty assumption that rural wages should always be lower than urban wages. In the 2008 proposed inpatient rule, CMS stated that if two hospitals in a certain state decide to change status from critical access hospital (CAH) to prospective payment system (PPS), a rural floor would be created for all wage index values in the state (CMS 2007). Because of the high wages paid in these two rural communities, the rural floor would cause Medicare payments to urban hospitals in the state to rise by more than $220 million per year. The fact that the movement of one or two CAHs in or out of the PPS system can increase (or decrease) Medicare payments by $220 million suggests there is a flaw in the design of the wage index system.

While some exceptions have odd outcomes, others have reasonable outcomes but lack a firm theoretical foundation. The rural counties of North Dakota have a base wage index more than 10 percent below the rural wage index in all neighboring states. The Section 508 exception temporarily erased this differential (see text box, p. 128). However, the Section 508 exception assumed that all North Dakota hospitals were part of the Fargo labor market even if they were hundreds of miles away. Increasing the North Dakota wage indexes to a level similar to indexes in neighboring states (i.e., removing the cliff) was a good outcome, but other mechanisms could remove the differences between adjacent counties without distorting the concept of labor markets.

A combination of exceptions in Connecticut results in 27 of 32 hospitals reclassifying in some way to a different area's wage index in fiscal year 2007. Twelve hospitals are lifted up by the Connecticut rural floor, 10 are reclassified under the 508 provision, 3 receive special exceptions, and 2 are just reclassified. Only 5 hospitals receive a wage index based on wages paid in their own market.

The current system of multiple exceptions, distorted concepts of labor markets, and rural floors has created enough distortions to the current system to motivate a new approach to the wage index. ■

determine the wage index. About half the market areas have three or fewer reporting hospitals; 58 markets (13 percent) have only one reporting hospital. This characteristic of the current system has concerned many providers. Using data from all employers will reduce (but not eliminate) the circularity problem, with the greatest benefit for occupations—such as clerical, housekeeping, and food service—with many employers other than hospitals.

New approach

In this chapter, we present a pragmatic approach to constructing a wage index that starts from the following principles. It should:

- be theoretically sound;
- address limitations in the current approach (large numbers of exceptions, occupational mix, circularity);
- use readily available data from all employers;
- use boundaries for geographic areas that are commonly used and understood and for which data are available;
- take into account all compensation costs, both wages and benefits;
- not create greater data-reporting burdens on hospitals; and
- be seen as fair by providers in other sectors as well as by hospitals.

A system for adjusting for geographic differences in labor input costs should isolate the labor-related costs of doing business that differ solely because of geography. The goal is an index that is more reflective of overall market conditions and less reflective of individual hospitals' market power and their choices about the type of

employees hired and the types of services offered. Because all employers participate in the labor market, the sample of wages used to construct the index should come from all employers of similar workers. Hospitals must compete with all other potential employers for workers, not just with other hospitals.

One could argue that many separate labor pools may exist for each occupation. For example, if nurses at IPPS hospitals represent one labor pool and nurses in doctors' offices represent a different labor pool, there may be imperfect competition across these pools when employers hire nurses. However, because we are interested in the relative wages across areas, this would be a disadvantage only if a market had a disproportionate share of nurses working for hospitals and if wages for nurses varied substantially by industry. This does not appear to be a significant problem because, at the national level, wages for RNs working in hospitals average $27.80, while wages for those working in physicians' offices average $27.03. (Physicians' offices are the second largest employer of RNs.) For the most part, relative wages between areas are usually well represented by treating each occupation as one labor pool in a market area.

The new approach starts with readily available all-employer wage data and then uses a fixed-weight (Laspeyres) wage index approach to construct the index. A Laspeyres index reflects wage variation and not variation caused by occupational mix (Pope 1989). Because of its advantages, a Laspeyres index was chosen to construct the geographic practice cost index used in the physician payment system (Zuckerman et al. 1990). The Government Accountability Office found that approach to be valid in its design, although the data and methods need some refinement (GAO 2005). RTI found that the fixed-weight Laspeyres form is reasonable for creating a hospital wage index and that it is simple, widely used, accepted, and understood (Dalton et al. 2007).

We start with Bureau of Labor Statistics (BLS) survey data that provide wages for specific occupations by MSA and for the balance of each state across all industries. These data meet our criteria because they are from a sample of all employers, are readily available, are credible, and are aggregated by useful geographic areas.[2] We then create occupational weights for each industry (hospital, nursing facility, home health agency) using BLS-reported industry-specific national average employment and wages by occupation. For example, if RNs represent 37 percent of employee wages in hospitals nationwide, we weight RN wages 37 percent in each labor market area when calculating the area's average hospital wage. This approach (detailed in the section on additional technical information, p. 145) automatically adjusts for occupational mix; thus, CMS would not have to conduct an additional survey, calculate an adjustment, and recalculate the wage indexes as required in the current approach. For each area, the occupation weights are multiplied by the ratio of wages for that occupation compared with the national average wage paid to that occupation and then summed to create a wage index value for the area. (Physicians providing patient care are not included as an occupation because Medicare pays them through the physician fee schedule. Physicians who are managers and classified as such by their employer are included as managers.)

We then use county-level, occupation-specific wage data from the census to further refine the MSA and statewide rural wage indexes. We do this because statewide rural areas may contain distinct labor markets within them, areas within an MSA may have differing wage levels, and there could still be large differences in wage indexes between adjoining areas.[3] This step produces county-level wage indexes. As a last step, we smooth differences between county-level wage indexes to reach a target level of tolerable difference between adjoining counties.

We do not use the county-level wage data from the census directly to create a county-level index for two reasons. First, MSAs are constructed based on commuting patterns and hence roughly represent a labor market. Therefore, we want to preserve the information at that level. Second, census wage data have limitations. They have gaps for some occupations in sparsely populated counties, are self-reported, and are difficult to use alone; also, they are not updated as frequently as the BLS data. The most current census data are from 2000. Because of the limitations of the census data, we limit their impact on the wage index to a 5 percent deviation from the wage index based on BLS data.

In addition to the wage data from BLS and the Census Bureau, we have also developed data on benefits such as health insurance, pensions, and mandatory payroll taxes from hospital, SNF, and home health provider cost reports submitted to CMS. We included an adjustment for benefits because they differ as a percent of wages across geographic regions (Dalton et al. 2007, BLS 2006). We incorporated those data into our wage index algorithm to create a compensation index, which can be compared more directly with the CMS hospital wage index because

the CMS index also includes benefits. We used the same cost report benefit data that CMS used in the current wage index; the only difference is that we used benefit data from hospitals, SNFs, and home health agencies while CMS used only hospital data.

There are no perfect definitions of labor market areas, and wage and benefit data are also imperfect. This new method represents a pragmatic compromise in many respects. Recognizing that current market area definitions (MSA and statewide rural) can be too large and counties can be too small to represent labor market areas, we created a hybrid that allows variation by county within a market area, but within limits. Because too great a difference between adjoining areas can seem arbitrary, we introduced county-level indexes and smoothing to reduce differences. Because data on benefits at the market level are not available from BLS, we introduced data gathered from provider cost reports to adjust for differences in benefits across market areas, knowing those data have limitations. This alternative balances the limitations of some data sources with the strengths of others to create an index with some desirable properties—less year-to-year volatility, smaller differences between adjoining areas, and automatic adjustment for occupation mix. These results are described in detail in the following section.

Results

In this analysis we use data from BLS, including a calculation of each MSA's and rural rest-of-state's MedPAC wage index. We also add benefit data from hospital, SNF, and home health agency cost reports to compute a MedPAC compensation index (described in the section on additional technical information). The MedPAC wage and compensation indexes have a fairly high correlation with the index Medicare currently uses (correlation coefficient (R^2) of about 0.90). Nonetheless, there are some systematic differences. Compared with Medicare's hospital wage index, MedPAC's wage and compensation indexes:

- have smaller differences between adjoining geographic areas,
- are less volatile from year to year,
- have lower wage index values in the (currently) highest wage index areas and higher values in the (currently) lowest wage index areas,
- explain slightly less of the variation in hospital costs (R^2 of 0.823 versus 0.836),
- automatically take into account occupational mix rather than requiring additional adjustments, and
- would lessen the burden on hospitals to collect data.

Table 6-3 (p. 134) summarizes some important points of comparison between the current (fiscal year 2007) CMS hospital wage index and the two alternatives we studied. This analysis of our two alternatives is at the hospital level, using the current CMS post-reclassification wage index values for each hospital as the reference point. (It does not include the Section 508 additions to the wage index because those adjustments use additional money (are not budget neutral) and expire at the end of fiscal year 2007.) We show the MedPAC wage index and the MedPAC compensation index. The latter includes an adjustment for benefits.

Another way of evaluating the results is to consider how each system treats the hospitals that are exceptions under the current system. Table 6-4 (p. 135) uses as its reference point the basic (prefloor pre-reclassification) wage index that CMS calculates and shows the percentage change in the wage index from it to the final CMS system and to the new MedPAC compensation index. Table 6-4 shows that, if the current exceptions were created to meet a need, the new system might meet that need better and do so automatically without resorting to an exception process:

- The 2,096 hospitals with no exceptions experience no change moving to the final CMS wage index and have a small increase of 1.7 percent moving to the MedPAC index. These hospitals see an increase in part because they no longer have to pay for the reclassification of other hospitals through a budget-neutrality adjustment.
- The 224 hospitals in counties receiving an outcommuting exception (often located in counties bordering higher wage index markets) would receive a 5.8 percent increase above the pre-reclassification wage index compared with the 4.8 percent they receive under the current set of CMS exceptions.
- For hospitals with geographic reclassification, which arguably are overrewarded under the current system and can now receive very large increases (some hospitals have a wage index increase of more than 20 percent), there would still be an increase under the

TABLE 6–3

Comparison of CMS hospital wage index and two alternatives

	Current CMS wage index (without Section 508)	MedPAC wage index	MedPAC compensation index
Unit of analysis	Each hospital's average hourly wage	Each occupation's average wage in the market	Each occupation's average wage in the market
Occupational mix	Separate survey used in an attempt to correct for occupational mix differences	Fixed weights for each occupation, equal to that occupation's share of national hospital wages	Fixed weights for each occupation, equal to that occupation's share of national hospital wages
Employers surveyed	Hospitals only	All employers of hospital-type workers (e.g., include SNF RNs)	All employers of hospital-type workers (e.g., include SNF RNs)
Source of wage data	Hospital cost report	BLS/Census surveys	BLS/Census surveys
Source of benefits	Reported on hospital cost reports	None	Estimated for all employees from hospital, SNF, and home health cost reports
Market definition	MSA/statewide rural	MSA/statewide rural and county blend	MSA/statewide rural and county blend
Lowest index value	0.7368	0.7659	0.7535
Highest index value	1.5617	1.4734	1.5028
Largest difference in index values between hospitals in neighboring counties	28%	10%*	10%*
Ability to explain hospital costs (R^2 value)**	0.836	0.819	0.823

Note: SNF (skilled nursing facility), BLS (Bureau of Labor Statistics), MSA (metropolitan statistical area). The second column is the 2007 CMS wage index without the Section 508 reclassifications.
*Difference is constrained to be no more than 10 percent by algorithm in MedPAC indexes.
**Percentage of the variation in hospital costs explained in a regression using the specified wage index.

new system, but it would be smaller. The adjustment would be, on average, similar to the adjustment for the previous category. Those 758 hospitals would receive an increase of 4.8 percent, which is less than the 8.3 percent increase under the current system.

- Finally, hospitals with special exceptions, which by definition meet none of the other criteria, would receive a very small increase instead of a 7.9 percent increase under the current system.

Arguably, the new system would remove the need for exceptions by automatically adjusting the market area (MSA and statewide rural) index values to remove large differences between adjoining areas. It does so by calculating county-level index values and then smoothing any remaining large differences. The new system would automatically target those adjustments to where they are most needed. Under the new system, a similar increase would result for other providers in the same counties, such as SNFs and home health agencies. Currently, other providers receive no adjustment when hospitals reclassify to another geographic area.

Wage index cliffs

If there are large differences between the wage indexes of adjoining market areas—for example, between a statewide rural area and an adjoining MSA—hospitals near the border may object if they receive the lower wage index. In reaction to these objections, geographic reclassification was instituted so that hospitals that are near other hospitals with higher wage indexes can seek a higher wage index. (The text box (p. 128) specifies when reclassification is allowed.) We refer to large differences in wage index values between adjoining geographic areas as wage index cliffs.

We compute our alternative wage and compensation indexes in three steps. The first step in the alternative method is to calculate market area wage indexes at the MSA and statewide rural areas using BLS area wage data and BLS industry-specific occupational weights. For the compensation index, benefit data are also incorporated at this step. (The section on additional technical information provides details on constructing the alternative compensation index, p. 145.)

To lower wage index cliffs, in the next step, we vary the wage index within market areas—that is, within MSAs and within the statewide rural areas. We use county-level census data to vary the market area wage index and create a county-level wage index. As discussed in the section on additional technical information, we set limits on the extent to which counties within a market area can vary from the market wage index. In the current model, we restrict each county to be within 5 percent of the MSA or statewide wage index. Given that some counties may have a wage index up to 5 percent below their MSA's mean wage index and some may have a wage index 5 percent above their MSA's mean wage index, the maximum difference in wage indexes between counties in the same MSA would be 10 percent.[4]

The last step further lowers the remaining differences between adjoining counties. We call this step smoothing. It is accomplished by:

- comparing all counties with each of their neighbors;
- finding the greatest difference between each county and its neighbors;
- if that difference is greater than an acceptable threshold, reducing it to the threshold (10 percent in this example) by increasing the lower wage index; and
- revaluing the entire set of wage index values to be budget neutral to the original set of wage index values, which is necessary because the previous steps would have increased some wage index values and not reduced any others.

The algorithm is then repeated until no difference greater than the specified threshold remains. The section on additional technical information discusses the smoothing algorithm and limits in more detail.

For example, in the Atlanta MSA, the calculation using BLS data yields a market level wage index of 0.99. Adjusting for county-level census wage data, we would calculate wage indexes for the 28 counties in that MSA ranging from 0.93 to 1.01.[5] Similarly, within the statewide rural area, we would calculate a wage index of 0.88 from BLS data with the county-level wage index varying from 0.83 to 0.93 when we use census data.

The results of these steps are shown in the maps in Figure 6-1 (p. 136).

TABLE 6–4

MedPAC compensation index is higher than the current pre-reclassification index for many hospitals benefitting from exceptions

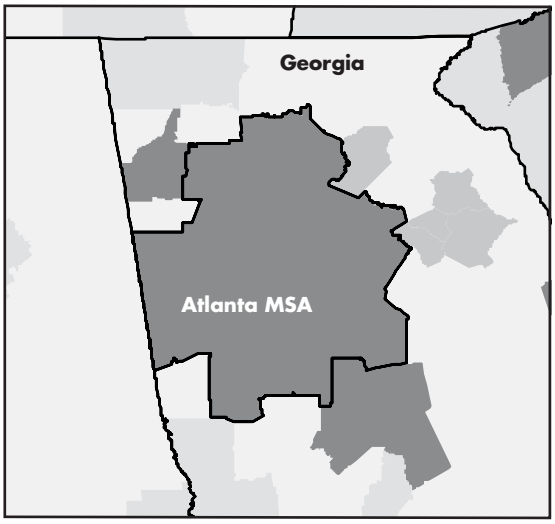
Exception status	Number of hospitals	Percent increase from pre-reclassification index value to: Current system with exceptions	MedPAC compensation index
No exception	2,096	0.0%	1.7%
Outcommuting only	224	4.8	5.8
Reclassification	758	8.3	4.8
Special exception	18	7.9	0.3
Other hospitals	429	3.9	4.9

Note: Some hospitals were eliminated from this table because their reported pre-reclassification wage index appeared to be in error; therefore, this table includes only 2,096 rather than 2,135 hospitals without exceptions. Changes are all positive because the budget-neutrality adjustment in the current system is made to the base payment amount, not to the wage index values. However, the MedPAC compensation index is constructed to be budget neutral to the CMS wage index with exceptions, so values in the two columns are comparable. Other hospitals include Lugar counties, Section 401, rural floor, and hold-harmless exceptions. For details, see text box on p. 128.

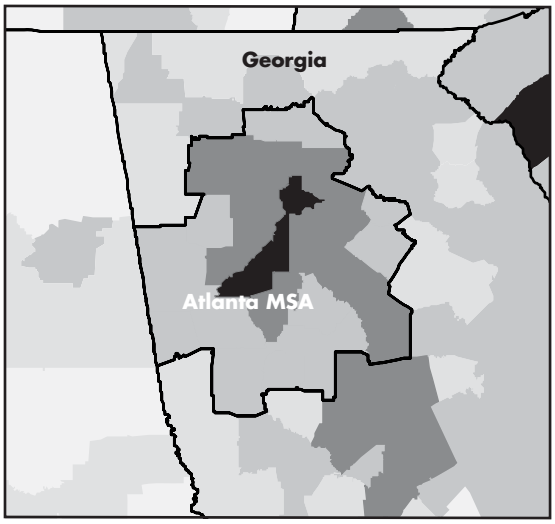
Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey, 2000 census data, and fiscal year 2007 CMS impact file.

FIGURE 6–1 **MedPAC compensation index reduces wage index differences between adjacent counties**

6-1A: Current wage index:
Sharp differences between adjoining areas



6-1B: MedPAC county-level compensation index:
No sharp differences remain



Wage index: 1.00 to 1.10 | 0.95 to 1.00 | 0.90 to 0.95 | 0.85 to 0.90 | 0.75 to 0.85

Source: MedPAC analysis of the 2005 Bureau of Labor Statistics Occupational Employment Survey and 2000 census data.

For a portion of Georgia, Figure 6-1A shows the CMS pre-reclassification wage indexes for the CMS MSA and statewide rural market areas. The darkest area is the Atlanta MSA, which has the highest CMS wage index value (0.98). It borders directly on the Georgia statewide rural area, which has an index value of 0.78. The difference, or cliff, is 0.20, which a provider in the statewide rural area just across the MSA border may consider inequitable.

Figure 6-1B shows the result of our county-level wage index calculation and smoothing. Differences now appear among counties inside the Atlanta MSA, with those at the center having higher wage indexes than those farther out. Variation also appears in the statewide rural area, with higher values appearing nearer the MSAs. As a result, differences among adjoining counties decrease. Very light areas do not often adjoin very dark areas, and no differences among adjacent counties exceed 10 percent.

Year-to-year volatility

Large changes in an area's wage index from one year to the next cause concerns among providers. Theoretically, it seems unlikely that relative wage rates would change substantially from year to year other than to reflect very unusual circumstances.

Volatility in the wage indexes

Wage index values for hospitals showed some large changes from 2006 to 2007. Comparing Medicare's post-reclassification hospital wage index values, the median absolute change was 1.4 percent, with a 4.0 percent change at the 90th percentile and a 5.4 percent change at the 95th percentile. The top 1 percent of hospitals experienced changes of more than 13 percent. In 100 hospitals wage indexes decreased by more than 5 percent. This is noteworthy because, assuming a labor share of around 70 percent, that amount would have more than offset the hospital update, which was 3.4 percent for 2007.

The MedPAC compensation index reflecting the same time period was slightly less volatile. The median change was 1.0 percent, with a 2.4 percent change at the 90th percentile, and a 3.9 percent change at the 95th percentile. The top 1 percent of hospitals saw changes of more than 6.0 percent. Only 21 hospitals had decreases of more than 5 percent.

We expect the index using BLS data to be less volatile for two reasons. First, the BLS wage data are an average of the last three years of wage surveys for the region and should be less volatile than the CMS data, which are from a single year's cost reports. (For example, to compute the fiscal year 2004 wage index, 2001 BLS data—which incorporate data from 2001, 2000, and 1999—would be used. In contrast, CMS would use data from fiscal year 2000 hospital cost reports.) Second, the BLS surveys a sample of all employers rather than a single industry. Changes in the wages paid by all employers in an area should be less volatile than wages in a single industry. Averaging three years of CMS data would also reduce year-to-year volatility by about the same magnitude as our new approach, so the averaging process alone probably accounts for most of the improvement. However, averaging three years of cost report data would mean using cost report data with as much as a six-year lag.

Volatility in the underlying data

Our contractor, RTI, analyzed changes in the underlying data over six years and found that, in addition to being less volatile over the entire period, the BLS data were less volatile for all but one year-to-year change.

RTI also analyzed the underlying hospital cost report data and found that benefits were more volatile than wages, but total compensation (benefits plus wages) was not. RTI also found that benefits as a percentage of total hourly compensation have been increasing and they differ by region, being lower in the South. Therefore, it is important to include benefits when adjusting for labor costs across geographic areas (Dalton et al. 2007).

Impact analysis

Next we examine the impact of moving from the CMS wage index to the MedPAC compensation index. The MedPAC compensation index is highly correlated with the CMS index (0.92). This analysis is at the hospital level, using the CMS post-reclassification wage index values for each hospital. It excludes the Section 508 additions to the wage index because those adjustments use additional funds (are not budget neutral) and expire at the end of fiscal year 2007.

Table 6-5 compares the MedPAC compensation index and the CMS post-reclassification wage index by hospital group. The wage index for all hospitals as a group would increase by 0.5 percent on the basis of an unweighted average across hospitals under the alternative wage index system. (It is unweighted in the sense that all hospitals count equally regardless of their size or payments.) By definition, there is no change overall on a dollar-weighted basis because the MedPAC compensation index is

TABLE 6–5

Most hospital groups would have a slightly higher wage index under MedPAC's compensation index

Hospital group	Number of hospitals	Mean percent change from current (post-reclassification) index to MedPAC compensation index: Inpatient payments (dollar weighted)	Wage index value (hospital weighted)
Total	3,586	0.0%	0.5%
Exception status			
No exception	2,135	0.4	1.6
Outcommuting only	227	0.1	1.2
Reclassification	777	–1.3	–2.8
Special exception	18	–4.2	–6.9
Other hospitals	429	0.1	1.1
Rural	1,010	–0.7	0.7
<100 beds	722	0.2	1.6
100+ beds	288	–1.3	–1.6
Urban	2,576	0.1	0.5
<300 beds	1,988	–0.2	0.3
300+ beds	588	0.3	1.0
Teaching status			
Major teaching	298	0.2	0.9
Other teaching	786	0.2	0.6
Nonteaching	2,502	–0.2	0.5
Ownership			
Not for profit	2,114	0.0	0.5
Proprietary	873	0.0	0.1
Government	596	0.1	1.1

Note: Outcommuting only includes Section 505 hospitals. Reclassifications are geographic reclassifications under the Medicare Geographic Classification Review Board standard criteria. Special exceptions are as defined in the text box, p.128. Other hospitals include Lugar counties, Section 401, rural floor, and hold-harmless exceptions. Post-reclassification refers to the 2007 CMS wage index with all adjustments except Section 508 reclassifications.

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey, 2000 census data, and fiscal year 2007 CMS impact file.

TABLE 6–6

Contribution of different parts of methodology to total impact of MedPAC compensation index

		Percent change in wage index			
		Parts of methodology			
Hospital group	**Number of hospitals**	**BLS data**	**Adjusting for benefits**	**County level with smoothing**	**Total**
Total	3,586	0.5%	–0.2%	0.2%	0.5%
Exception status					
No exception	2,135	2.1	–0.4	0.0	1.6
Outcommuting only	227	–0.7	0.5	1.4	1.2
Reclassification	777	–3.6	0.3	0.5	–2.8
Special exception	18	–8.3	1.4	0.0	–6.9
Other hospitals	429	1.0	–0.1	0.2	1.1
Rural	1,010	–0.2	0.3	0.6	0.7
<100 beds	722	0.7	0.2	0.6	1.6
100 + beds	288	–2.6	0.5	0.6	–1.6
Urban	2,576	0.7	–0.4	0.1	0.5
<300 beds	1,988	0.5	–0.4	0.1	0.3
300+ beds	588	1.4	–0.3	0.0	1.0
Census region					
New England	147	–2.0	0.3	0.8	–0.9
Mid-Atlantic	429	–1.5	1.2	0.2	–0.2
South Atlantic	610	2.7	–0.8	0.0	2.0
East North Central	520	–0.3	1.0	–0.1	0.7
West North Central	272	0.3	–0.6	0.3	0.1
East South Central	344	3.1	–0.6	0.2	2.7
West South Central	567	1.9	–1.9	0.0	0.0
Mountain	230	–0.8	–1.2	0.6	–1.4
Pacific	467	–2.0	1.0	0.9	–0.2

Note: BLS (Bureau of Labor Statistics). All changes are calculated relative to the post-reclassification index. Post-reclassification refers to the 2007 CMS wage index with all adjustments except Section 508 reclassifications. All entries are hospital weighted not dollar weighted, so average percent change in wage index does not sum to zero. Outcommuting includes only Section 505 hospitals. Reclassifications are geographic reclassifications under the Medicare Geographic Classification Review Board standard criteria. Special exceptions are as defined in the text box, p. 128. Other hospitals include Lugar counties, Section 401, rural floor, and hold-harmless exceptions.

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey, 2000 census data, and fiscal year 2007 CMS impact file.

constructed to be budget neutral to the CMS index. The change in wage index is often greater than the dollar-weighted change because the labor share of the base payment is less than 1 (either 0.62 or 0.69).

As we discussed earlier, the new system would eliminate the need for the current exception process. For the 2,135 hospitals with no exception, both the dollar- and the hospital-weighted average wage index values increase. The 227 hospitals with an outcommuting adjustment to their wage index on average would see more of an increase in their wage index under the new system. Those hospitals now being reclassified would see a decrease of 1.3 percent dollar weighted and 2.8 percent hospital weighted.

Hospitals granted a special exception would see an even larger decrease.

Urban and rural hospitals would gain about the same percentage hospital weighted. However, because some large rural hospitals reclassify under special provisions, rural hospitals have a 0.7 percent decrease dollar weighted. If the MedPAC approach were also used for SNF and home health providers, rural SNF and home health providers on average would see payment increases. Aggregating across all sectors, total rural payments would increase slightly.

Most categories of hospitals would see fairly small percentage changes in their wage index as a group, although some individual hospitals would see large percentage changes. Some hospitals that currently receive large benefits from reclassification could experience a significant decline in their wage index, and some hospitals in counties next to high-wage-index areas—but that have not been able to reclassify—will see significant increases because of county-level data and smoothing.

Table 6-6 shows the effect of each step in the new system relative to the current CMS hospital wage index. For each hospital group, we look first at the change resulting from using BLS wage data, next at the effect of adding benefits to our calculation, and then at the effect of county-level wage indexes and smoothing.

For example, using BLS data increases the average wage index of hospitals with no exception by 2.1 percent, adding benefits reduces that increase by 0.4 percent, and moving to a county-level index with smoothing adds a small amount. Using the BLS data noticeably reduces the wage index for hospitals that reclassify and receive special exceptions. The effect of adding benefits to the calculation is most noticeable regionally. The wage indexes in the Mid-Atlantic, East North Central, and Pacific census regions increase by 1 percent or more, and those in the West South Central and Mountain regions decrease by more than 1 percent. The direction of this effect accords well with differences BLS reported in all-employer benefits across census regions (BLS 2006). The county-level data and smoothing step increase the wage index for hospitals now receiving an outcommuting exception, which makes sense because they are in counties adjacent to a market area with a higher wage index. Otherwise, this step does not have a large systematic effect on these hospital groups.

Even though the change in wage index is budget neutral, slightly more hospitals would see their wage index go up rather than down, because small rural hospitals tend to benefit from the MedPAC index. Figure 6-2 (p. 140) shows the distribution and magnitude of these changes.

For example, almost all hospitals in North Dakota would see their wage index values increase and become similar to the South Dakota values. In the CMS system, there are only seven rural hospitals in North Dakota because wage data from critical access hospitals (CAHs) are not included in the calculation. (Sixteen states have 10 or fewer IPPS hospitals in their statewide rural area.) Our new approach uses data from all employers so CAHs are included as well as all other employers with workers in the occupations considered. This addresses a concern of IPPS hospitals in areas where their competitors are principally CAHs. Those hospitals argue that they are competing with CAHs for employees, yet the CAH wages are not in the wage index for the area. If the CAHs offer higher wages, the IPPS hospitals think they are at a disadvantage.

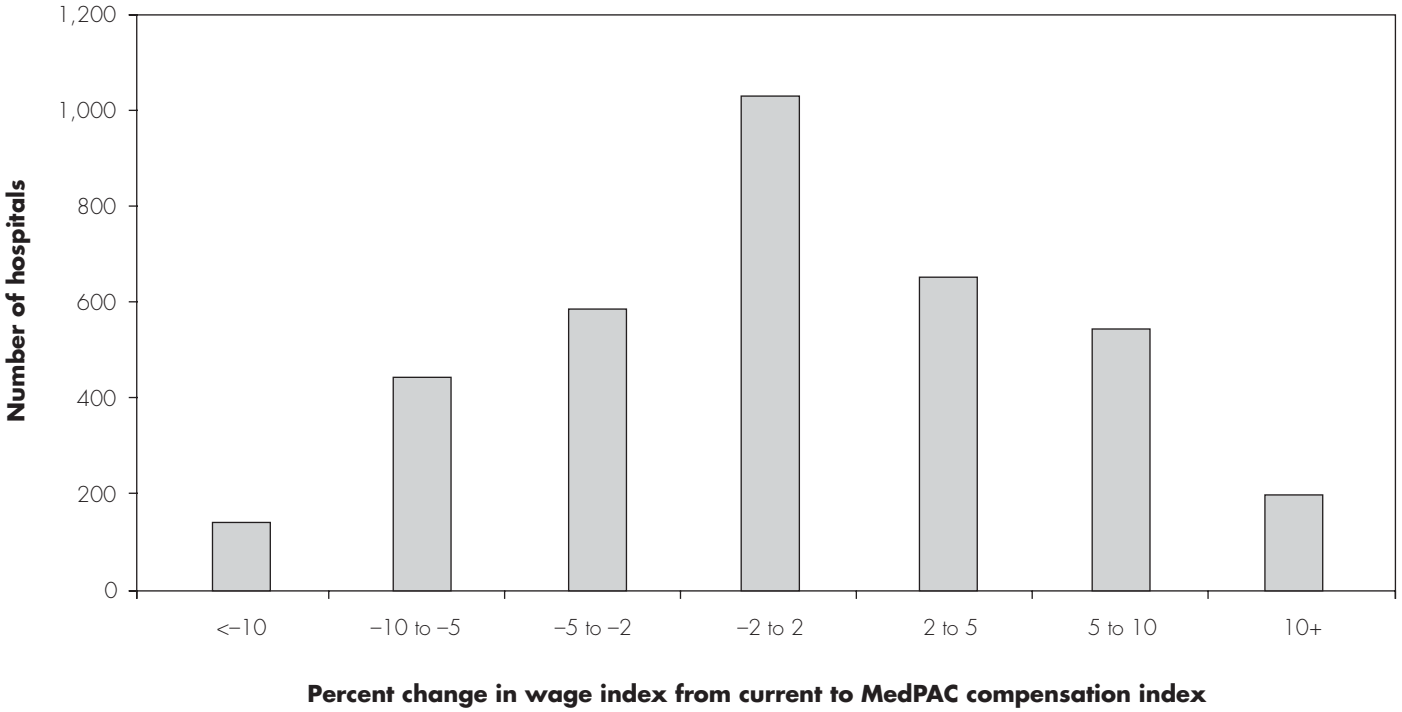
Figure 6-3 (p. 141) shows the changes in inpatient payments moving to the new MedPAC compensation index from the current post-reclassification hospital index. There are fewer large changes in payments because the wage index adjusts less than 70 percent of the total payment. (In other words, the labor share is about 0.7 for areas with wage indexes above 1 and 0.62 for areas with wage indexes below 1.)

One would find a similar result for outpatient payments. However, the result would not be exactly the same because the labor share in the outpatient PPS is lower (0.6) and because of other differences in the payment systems.

Nonetheless, some hospitals would see a large change in their payments. Therefore, a transition period may be warranted; abrupt, large changes could be avoided by phasing in the change for providers with a large change in their wage index value. One option is to scale changes in the wage index to the update in a way that considers the joint effect of the update and the change in the wage index. Other options include phasing in large changes proportionally over three or four years and specifying a maximum permissible change per year. The MedPAC compensation indexes for each county, computed with the data available in January 2008, are available on the MedPAC website at www.medpac.gov.

FIGURE 6–2

Slightly more hospitals would see an increase than a decrease in their wage index value under the MedPAC compensation index



Note: Percent change in wage index value from current post-reclassification hospital wage index (not including Section 508 reclassifications) to MedPAC compensation index.

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey, 2000 census data, and fiscal year 2007 CMS impact file.

Explaining inpatient hospital costs

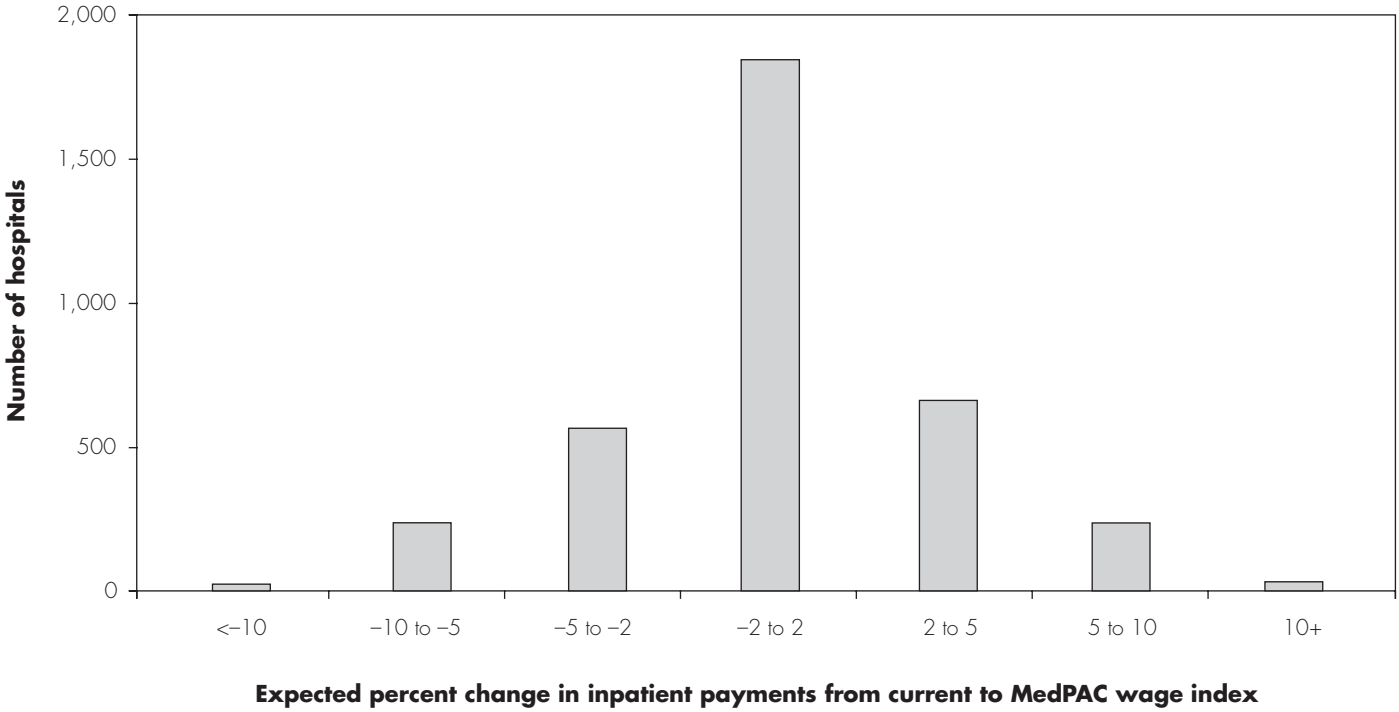
We used a regression model to evaluate the degree to which Medicare payment variables—including a wage index—can explain variation in hospital costs per discharge. The question was whether Medicare payments would more closely match hospital costs if we switched from the current Medicare wage index to our alternative index. Our regression results show that the current wage index explains slightly more of the variation in hospital costs than the MedPAC compensation index. The R^2 value is 0.836 using the CMS post-reclassification index in our model and 0.823 for the MedPAC index. The CMS wage index may be more closely related to hospital costs than the alternative because of the circularity of the present system. If hospitals report high labor costs, their wage index increases either directly or because they are allowed to reclassify. In addition, if a hospital is reclassified into a higher wage index area, it may spend the additional income it receives. To the degree that this is true, any existing wage index will be biased toward fitting hospital costs better than new alternative wage indexes.

Wage index differences across sectors

Medicare uses average hospital wages as reported on Medicare cost reports for hospitals to determine the wage indexes used in the PPSs for many of the provider types in Medicare (e.g., long-term care hospitals, inpatient rehabilitation facilities, SNFs, home health agencies, hospices, dialysis facilities). This assumes that relative wages for hospital workers are representative of relative wages for all other types of providers and that labor market areas are the same for all provider types. Using only IPPS hospital data means that almost half of the counties in the country do not have data for the wage index calculation. For example, a home health agency in Martha's Vineyard recently objected because it was assigned last year's rural wage index in Massachusetts, even though there were no rural hospitals to base it on and the old value was for a distant hospital.

FIGURE 6–3

Changes in hospital payments are smaller than changes in wage index values



Note: Percent change in Medicare inpatient payments is from current post-reclassification hospital wage index (not including Section 508 reclassifications) to MedPAC wage index.

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey, 2000 census data, fiscal year 2007 CMS impact file, and MedPAC payment model simulations.

Constructing sector-specific compensation indexes

With the alternative method, provider sector-specific indexes can be constructed using the same multiprovider data and varying the occupational weights. For example, the proportion of RNs used by home health agencies nationwide would be used to compute the weight for RNs in the home health agency index. Those sector-specific weights would then be multiplied by the occupation-specific wages for each area (used for all sectors) to compute the home health agency average wage for each area. This average would then be compared with the product of the weights and national average wages for these occupations to create a compensation index value.

We have constructed compensation indexes for hospitals, nursing facilities, and home health agencies. We used BLS national-level data to determine the share of occupations represented in each industry. Table 6-7 (p. 142) shows the share of wages the top 10 occupations represent in each sector. RNs account for about 37 percent of wages in hospitals, followed by office workers with 10 percent. Health care support workers account for about 32 percent of wages in nursing homes, followed by LPNs with about 16 percent. RNs account for about 26 percent of wages in home health agencies, followed by health care support workers with about 21 percent.

As an example, we created a nursing facilities index using our technique and the occupational weights for nursing facilities and compared it with the current pre-reclassification hospital wage index, which is used for SNF payment. (SNFs do not receive any exceptions to the wage index, even when hospitals near them do.) We found that SNFs seeing increases over the current wage index tended to be in counties adjacent to MSAs with higher wage indexes. On average, payments for SNFs in

TABLE 6–7

Top 10 occupation categories by sector, share of wages

Occupation	Hospitals	Nursing facilities	Home health agencies
Registered nurses	36.8%	13.8%	25.9%
Office and administrative support occupations	10.0	4.5	7.6
Health care support occupations	7.3	32.4	21.1
Management occupations	6.4	6.5	7.8
Licensed practical and licensed vocational nurses	2.8	15.7	8.1
Radiologic technologists and technicians	2.4		
Medical and clinical laboratory technologists	2.2		
Pharmacists	2.1		0.6
Building and grounds cleaning and maintenance occupations	1.8	4.8	
Respiratory therapists	1.6		
Food preparation and serving related occupations		7.8	
Personal care and service occupations		2.2	12.9
Physical therapists		1.4	4.8
Occupational therapists		1.9	1.6
Speech–language pathologists			0.8
Total of top 10 occupations	73.3	90.0	91.1

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey.

rural areas increased by 1.6 percent, with 1,961 SNFs gaining and 1,551 SNFs losing. In urban areas, the average decrease was 0.3 percent, with 4,250 SNFs gaining and 4,330 SNFs losing.

Using the same technique to construct compensation indexes for each sector, while accounting for the differences in occupational weights, we find that the compensation indexes for all three sectors are highly correlated. The correlation between the hospital and the home health agency indexes is 0.96, the correlation between the nursing facility and the hospital indexes is 0.94, and the correlation between the nursing facility and the home health agency indexes is 0.97.

One argument for using separate compensation indexes for each sector despite the high correlation is that the administrative burden of developing unique sector indexes would be fairly low. All compensation indexes use the same raw BLS and census data and the same benefit information from provider cost reports.[6] Differences in sector compensation indexes would result only from differing occupational weights, the level of benefits, and the subsequent adjustments to market area values in the county refinements and smoothing. Providers would experience no additional burden.

On the other hand, we cannot be sure that a "nursing facility" or "home health" compensation index would be a better compensation index for Medicare skilled nursing facilities or Medicare home health services than the hospital compensation index. One problem with the nursing facility index is that these facilities have two distinct products. One is long-term care, often for Medicaid recipients. The second is post-acute care of Medicare beneficiaries. We have data on the wages of workers in nursing facilities that provide both services combined. However, the mix of workers serving Medicare patients may be more likely to be therapists, RNs, and LPNs, while the mix of people serving the long-term residents of the nursing facility will be weighted more toward nursing aides and other lower wage workers. The compensation index we calculated for nursing facilities is already highly correlated with the compensation index calculated for hospitals (0.94). Because the mix of workers providing post-acute care to Medicare beneficiaries is often more highly paid than the average nursing facility employee, a true SNF compensation index for Medicare services would probably be even more highly correlated

with the hospital index than the nursing facility index we computed.

A similar argument holds for home health agencies. The compensation index calculated for home health agencies already has a 0.96 correlation with the hospital index. If a Medicare-specific occupation mix for home health agencies were defined, with more therapy and less personal aide services, the correlation would be even higher.

Using one compensation index for all sectors

Given the high correlations between the compensation indexes and the imperfect occupational mix data for Medicare nursing facility services and Medicare home health services, one compensation index may be roughly as accurate as three compensation indexes. One index would not mean that average wages in hospitals, SNFs, and home health agencies are the same in a geographic area. Rather, it would mean that relative wages among geographic areas are similar for the three types of providers. For example, the ratio of SNF wages in county A to SNF wages in county B would be similar to the ratio of hospital wages in the same counties, although hospital wages might be higher than SNF wages in each county.

One index may seem more equitable as well. All providers in the same county would have the same compensation index; no one could reclassify out. The compensation index would also be based on all-employer wage data and all-provider benefit data. Thus, even if the hospital occupational weights were used, it would no longer be a hospital-only compensation index as is the current one. This might make it more acceptable to other providers.

If SNFs and home health agencies were paid based on the MedPAC compensation index, rural SNF payments would increase on average by roughly 2.4 percent and urban SNF payments would decline on average by 0.5 percent. There would be roughly 2,412 rural SNFs with increasing payments, 1,100 rural SNFs with decreasing payments, 4,223 urban SNFs with increasing payments, and 4,353 urban SNFs with decreasing payments if the MedPAC compensation index were used for all providers. Because home health payments are based on the location of the beneficiary, and not the location of the agency, we cannot easily categorize home health agencies as rural or urban. However, we can examine how payments change for the care of rural and urban beneficiaries. Payments to home health agencies for care for rural beneficiaries would increase on average by about 2.6 percent; in urban counties, they would decrease on average by about 0.6 percent. In general, the rural and urban impacts using the MedPAC compensation index for all providers are similar to the impacts we showed earlier using sector-specific compensation indexes for SNFs and home health agencies.

Caveats

We have demonstrated that it is possible to construct compensation indexes for each provider sector from available BLS and census data. The resulting compensation index has several advantages over the current hospital wage index. However, our compensation index requires deciding how to handle missing data, how much variation to allow between counties in a market area, and what limit to choose when smoothing between adjacent geographic areas. Making different decisions on these points would result in different index values. The sensitivity of the compensation index to these decisions could be further investigated by CMS—but our analysis indicates that the results appear fairly robust in the variations we have investigated.

Data limitations should also be recognized. BLS data are gathered in surveys of employers but do not include data on self-employed persons. An occupation with many self-employed people would be underrepresented in the national and local data. However, unless wages for the self-employed differ significantly from wages for employees in the same occupation, and the propensity for self-employment varies significantly by region, the effect on relative wages for that occupation would be minimal. Such a situation might happen if there were shortages of workers who tend to be self-employed in some markets and not others. (However, to noticeably affect the compensation index values, these occupations would also have to have a significant weight within the index.)

The BLS data also refer only to wages, not to wages and benefits. Because the ratio of wages to benefits differs across markets, we introduced an adjustment for benefits to address this limitation. The adjustment uses the benefit data in hospital, SNF, and home health agency cost reports submitted to CMS and shares the limitations of those data. CMS would have to audit worksheet A of the cost reports to ensure that providers report all their benefit expenses on worksheet A on the benefit line of the cost report in accordance with Medicare accounting rules.

The wage data we used for county-specific adjustments are from the 2000 decennial census. However, the age might not be a major limitation because we use the census data only to adjust (within a 10 percent corridor) the underlying BLS data, which are gathered semiannually. In addition, the American Community Survey is replacing the long-form census data and should provide more timely data in the future, particularly for more populous areas. Finally, the census data do not include wages for some occupations in some geographic areas because not enough people are in the sample. We use two techniques to correct for this problem. For the initial computation from BLS data, we compare those occupations for which we have data in an area with the same occupations at the national level, leaving out the local and national values for those occupations for which data are missing.[7] The magnitude of this problem is modest; we have data on occupations representing more than 95 percent of all wages in all markets. In the next step of the computation, we use county-level wage data from the census. If data for certain occupations are missing, we make the county wage equal to the market area (MSA or statewide rural) wage for that occupation. Other methods could be used or less-detailed occupational breakouts could be made to overcome this limitation.

Conclusion

There are no perfect definitions of labor market areas, and wage and benefit data are also imperfect. Our new method represents a pragmatic compromise in many respects. Recognizing that current market area definitions (MSA and statewide rural) can be too large and counties can be too small to represent labor market areas, we created a hybrid that allows variation by county within a market area, but within limits. Because too great a difference between adjoining areas can seem arbitrary, we introduced county-level indexes and smoothing to reduce differences. Because data on benefits at the market level are not available from BLS, we introduced data gathered from provider cost reports to adjust for differences in benefits across market areas, aware that those data have their limitations and that this method would require CMS to make some additional calculations. This alternative balances the limitations of some data sources with the strengths of others to create an index that represents a major improvement over the current wage index system. The MedPAC index approach:

- more fully reflects true labor input costs in the market by using occupational-level data that represent all employers and reduce circularity,
- automatically captures occupational mix without any burden on providers or CMS,
- reduces year-to-year volatility and wage index cliffs, and
- eliminates the need for exceptions.

Some providers in other sectors think the system is inequitable if the wage index they are assigned is less than that assigned to a nearby hospital, because the hospital is able to reclassify and they are not. At the same time, there are providers in parts of the country without any nearby IPPS hospitals. Providing a compensation index based on information from a sample of all employers in every area of the country and creating adjustments within the compensation index that obviate the need for exceptions solve both of these problems.

RECOMMENDATION 6A

The Congress should repeal the existing hospital wage index statute, including reclassifications and exceptions, and give the Secretary authority to establish new wage index systems.

RATIONALE 6A

The current law is prescriptive; CMS must use hospital-specific wage data and updates based on a survey of hospital costs (see text box, pp. 151–152, for the hospital wage index statute). The Secretary cannot make the changes to the wage index we have discussed administratively; the recommended change to the statute will give the Secretary that power. This expanded authority would include the ability to implement the new wage index and to refine it as necessary in the future under the normal notice and comment rule-making process.

IMPLICATIONS 6A

Spending

- The change is budget neutral.

Beneficiary and provider

- Granting this authority has no impact on providers or beneficiaries.

RECOMMENDATION 6B

The Secretary should establish a hospital compensation index that:

- **uses wage data from all employers and industry-specific occupational weights,**
- **is adjusted for geographic differences in the ratio of benefits to wages,**
- **is adjusted at the county level and smooths large differences between counties, and**
- **is implemented so that large changes in wage index values are phased in over a transition period.**

RATIONALE 6B

The current wage index calculation produces large differences between neighboring areas, which are modified through a complex exceptions process, but that process in turn creates new inequities. The new approach results in smaller differences between areas and thus lessens the need for exceptions. To protect providers from abrupt, large changes in their wage index value, we recommend a transition period. One option is to scale changes in the wage index to the update in a way that takes into account the joint effects of the update and the change in the wage index. Other options include phasing in large changes proportionally over three or four years and specifying a maximum permissible change per year.

The compensation index should be used for both hospital inpatient and hospital outpatient PPSs.

IMPLICATIONS 6B

Spending

- The change is budget neutral.

Beneficiary and provider

- Redistributes payments and has no impact on beneficiaries.

A wage index calculated as described will more fully reflect input prices, automatically adjust for occupational mix, reduce circularity, and reduce large differences between adjoining areas compared with the current system. It will also reduce the administrative burden on providers.

RECOMMENDATION 6C

The Secretary should use the hospital compensation index described in recommendation 6B for the home health and skilled nursing facility prospective payment systems and evaluate its use in the other Medicare fee-for-service prospective payment systems.

RATIONALE 6C

All providers in these sectors in the same county will have the same wage index because no reclassification will be allowed; this would be more consistent across providers. Separate indexes would add complexity without necessarily improving accuracy.

IMPLICATIONS 6C

Spending

- The change is budget neutral.

Beneficiary and provider

- Redistributes payments and has no impact on beneficiaries.

We did not evaluate use of the calculated index for long-term care hospitals, inpatient psychiatric facilities, inpatient rehabilitation facilities, facilities that treat patients with end-stage renal disease, ambulatory surgical centers, and hospices, but CMS should do so.

This recommendation would not be used for the physician fee schedule.

Additional technical information on constructing a compensation index from BLS data

We constructed wage indexes and compensation indexes using three sources of data: the BLS Occupational Employment Statistics (OES) survey, the 2000 decennial census data, and data from provider cost reports submitted to CMS.

We start with data from the BLS OES survey, which is published each May. For each MSA, state, and the nation, BLS staff estimate hourly wages by occupation across all employers in the geographic area. At the national level, they also provide for each industry an estimate of the share of employment in that industry for each occupation. They construct the estimates from a sample of 1.2 million

TABLE 6–8

Top 10 occupation categories by sector, share of employees

Occupation	Hospitals	Nursing facilities	Home health agencies
Registered nurses	28.1%	7.6%	14.5%
Office and administrative support occupations	15.5	4.5	8.0
Health care support occupations	12.9	42.3	33.0
Building and grounds cleaning and maintenance occupations	3.8	6.9	0.4
Licensed practical and licensed vocational nurses	3.6	11.8	6.5
Management occupations	3.4	2.8	3.1
Food preparation and serving related occupations	2.9	11.2	
Radiologic technologists and technicians	2.3		
Medical and clinical laboratory technologists	2.0		
Respiratory therapists	1.5		
Medical records and health information technicians		0.8	0.5
Physical therapists		0.6	2.0
Occupational therapists			0.7
Personal care and service occupations		2.8	25.0
Total of top 10 occupations	75.7	91.4	93.8

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey.

establishments drawn over three years. Hourly wages in the OES survey do not include benefits, and the sample does not include self-employed workers.

At the national level, the share of each of the top 10 occupations employed in hospitals, nursing homes, and home health agencies is shown in Table 6-8. The analysis does not include occupations that typically bill Part B for their services, such as physicians.

The occupation accounting for the greatest share of workers differs by industry. For example, RNs are the most common in hospitals, and health care support occupations are most common in nursing homes and home health agencies. However, there is significant overlap in the occupations all three industries employ, which implies that they compete for those types of workers. Nonmedical workers—for example, office workers—account for a large share of hospital payrolls. Presumably, hospitals compete with many industries to hire those workers.

To construct the occupational weights used in our hospital analysis, we limited our fixed-weight index to the 30 occupations shown in Table 6-9, which differs from Table 6-8 in that the occupations are weighted by the share of wages in the industry rather than by the share of employees. Higher paid occupations will have a wage share higher than their employment share. Further, we express the wage share as the percentage of wages that occupation accounts for relative to the total wage share these 30 occupations represent. For example, RNs have higher than average wages and account for 43.22 percent of the wages in the hospital industry represented by these 30 occupations. However, they represent only 28.1 percent of hospital employees. Conversely, health care support occupations have a wage share of 8.54 percent and an employment share of 12.9 percent because their wages are lower than the average hospital wage.

Computing relative compensation for each MSA and statewide rural wage area

In our first step, we compute compensation index values for each market area—the MSA (or divisions of MSAs) and the balance of state areas, which are the non-MSA counties in the state. We start by finding the relative wage for each occupation in each MSA. The relative wage for an occupation is the ratio of the mean wage for that occupation in the MSA to the mean wage for the same occupation nationally. The wages are for all employers of the occupation (as stated previously, this reduces the circularity of the wage index). In each market, the relative wages are then multiplied by the wage share weights for the set of 30 occupations shown in Table 6-9. The result

is the compensation index for the market (wages only, no benefits).

BLS computed the MSA and balance of state (statewide rural in CMS parlance) wage indexes for us. In some areas, the BLS data do not have a value for every occupation. In those cases, we asked BLS to compare those occupations for which they had data in an area with the same occupations at the national level to compute the wage index. This is equivalent to the assumption that the missing occupations have the same relative wages in that area as the occupations with data. In every market, BLS has wages for occupations representing more than 95 percent of hospital payrolls; hence, these missing data have little effect on the computed wage indexes. BLS does not report some occupation-specific data in markets where one dominant employer could be identified. By computing the index value and thus combining data for all the occupations, BLS was able to include those data and preserve confidentiality.

BLS uses New England city and town areas (NECTAs) rather than MSAs in some New England areas. Some argue that NECTAs better represent labor markets than MSAs or counties in New England. In these cases, we use the NECTA as the market and attempt to map it to a county. In some cases, counties and NECTAs do not match exactly, and we had to assign a county to a particular NECTA or an average of two NECTAs that are both in the county. If our recommendations are implemented, CMS could consider the option of using smoothed NECTAs rather than counties.

Source of benefit data

The hospital, SNF, and home health cost reports provide data on total wages and total benefit costs for each facility. The benefits (wage-related costs) and wages are currently reported in two places on cost reports: on worksheet S-3 (which is used for the wage index) and on worksheet A. Wage-related costs include the employers' share of the Federal Insurance Contributions Act (FICA) tax, Medicare taxes, unemployment insurance, health insurance, employer 401k contributions, pension costs for defined benefit plans, and other smaller categories of wage-related costs. Because benefits include payroll taxes (FICA, Medicare, unemployment), we know hospitals should be reporting benefit costs that are more than 7 percent of wages. Wage-related costs are reported on line 5 column 2 of worksheet A. Total wages are also reported on worksheet A on line 101. We computed benefits as a share of wages using worksheet A, excluding outliers (greater than 35 percent or less than 15 percent). When the worksheet A data were outliers, we used worksheet S-3. To eliminate the need for hospitals to file worksheet S-3 in the future, CMS should require that all hospitals state all their benefits' costs on worksheet A. In most cases, worksheet A data are exactly or approximately equal to worksheet S-3 data. In some cases, they may differ because hospitals use generally

TABLE 6–9

Share of hospital wages by occupation

Key hospital occupations	Share of wages
Registered nurses	43.22%
Office and administrative support occupations	11.73
Health care support occupations	8.54
Management occupations	7.45
Licensed practical and licensed vocational nurses	3.27
Radiologic technologists and technicians	2.83
Medical and clinical laboratory technologists	2.54
Pharmacists	2.48
Building and grounds cleaning and maintenance occupations	2.14
Respiratory therapists	1.88
Food preparation and serving related occupations	1.65
Physical therapists	1.55
Medical and clinical laboratory technicians	1.18
Surgical technologists	1.13
Medical records and health information technicians	0.99
Diagnostic medical sonographers	0.76
Occupational therapists	0.74
Pharmacy technicians	0.73
Cardiovascular technologists and technicians	0.72
Health technologists and technicians, all other	0.72
Emergency medical technicians and paramedics	0.61
Protective service occupations	0.58
Dietitians and nutritionists	0.43
Nuclear medicine technologists	0.41
Respiratory therapy technicians	0.41
Radiation therapists	0.35
Speech–language pathologists	0.34
Personal care and service occupations	0.28
Dietetic technicians	0.17
Psychiatric technicians	0.17

Note: Share of wages as percent of share represented by these 30 occupations.

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey.

TABLE 6–10 **Applying BLS data to hospital industry at a national and MSA level, 2005**

Occupation code	Job title	Hospital industry national: Mean hourly wage	Hospital industry national: Share of wages	Mean hourly wage for MSA
11–1000	Manager	$39.36	7.45%	$57.12
29–1111	Registered nurse	27.80	43.22	33.72

Note: BLS (Bureau of Labor Statistics), MSA (metropolitan statistical area). Data shown are for MSA code 35644 (NY, NY).

Source: MedPAC analysis of Bureau of Labor Statistics May 2005 Occupational Employment Statistics Survey.

accepted accounting principles for worksheet S-3 and Medicare accounting for worksheet A. However, Office of Inspector General (OIG) auditors informed us that they believe the data should match and that hospitals are required to follow Medicare accounting even on worksheet S-3. OIG reported cases in which this difference of opinion about accounting standards had a material impact on reported benefit expense (OIG 2007). Clarifying the reporting rules should resolve this problem. We did not obtain CAH benefit information for this analysis; however, in the future CMS may want to include it.

Computation of area benefit-to-wage ratios

The 2005 BLS survey data are based on surveys of establishments in 2003, 2004, and 2005. Therefore, to match the data as closely as possible with benefits, we compute the mean level of benefits over the same three years. We first create three-year averages of the benefit-to-wage ratios for hospitals, SNFs, and home health agencies in each market area. Because BLS wage data come from all employers, we create a weighted average of benefits to wages for each occupation in the region based on the national share of employment in that occupation across hospitals, SNFs, and home health agencies. We then create a weighted average benefit-to-wage ratio for the type of workers hospitals employ, the type of workers home health agencies employ, and the type of workers SNFs employ by multiplying the estimated benefit-to-wage ratio for each occupation by the national wage share of that occupation in each industry. The result is that every MSA and statewide rural area has its own benefit share for hospital-type workers, home-health-type workers, and SNF-type workers. On average, across all markets, hospital-type workers have a benefit-to-wage ratio of 24 percent, SNF-type workers have a ratio of 22 percent, and home-health-type employees have a ratio of 23 percent. Benefits tend to be slightly higher in high-wage areas and slightly lower in the South.[8]

Computation of the benefit-adjusted compensation index

The MSA-level compensation index is computed as follows.

We start with the national occupation weights from BLS, national mean hourly wages by occupation for the 30 occupations we examine, and an MSA's hourly wages by occupation. The data for two occupations are shown in Table 6-10.

For simplification, assume that data were available only for these two occupations (in reality BLS provided us with data on occupations representing more than 95 percent of wages in every market). Also assume that the ratio of benefits to wages was 27 percent in the market shown compared with a national average of 24 percent. The MSA-level benefits' adjusted wage index (before budget-neutrality adjustments) would then be equal to:

Wage index without benefits

$$= [(7.45\% \times 57.12/39.36) + (43.22\% \times 33.72/27.80)]/(7.45\% + 43.22\%)$$
$$= 0.6325/0.5066$$
$$= 1.2485$$

Compensation index with benefits

$$= (\text{wage index without benefits}) \times (1 + 0.27)/(1 + 0.24)$$
$$= 1.2787$$

The value of 1.2787 would not be the final value for the MSA-level compensation index. It is adjusted for budget neutrality to make the total payments provided to all hospitals under the current wage index (without the Section 508 adjustment) equal total payments under the new compensation index. Total payments are computed with an inpatient payment model that takes into account hospital-specific factors such as indirect medical

education payments, disproportionate share payments, sole community hospital status, outlier payments, and Medicare-dependent hospital status. Instead of modeling outpatient effects for budget neutrality, we assumed that outpatient shifts would be proportional to inpatient shifts.

Creating county-specific compensation indexes

As a second step, we used data from the 2000 census to adjust the wages within market areas by county. For each county, the Census Bureau provided data on wages by occupation and place of employment. The key occupations were RNs (census occupation 313), LPNs and licensed vocational nurses (census occupation 350), management (census occupations 001 to 043), and office and administrative support (census occupations 500 to 593). All the occupations in Table 6-9 (p. 147) were matched to census categories. We then aggregated county-level employment and wages from census data to create data for MSAs and statewide rural areas.

Next we screened and cleaned the county-level data. For all occupations except RNs, if there were 30 or fewer observations for an occupation in a county we replaced the county data with the census MSA or statewide rural average wage for that occupation. For RNs, we required that 50 respondents reported working in the county in the 2000 census. We set a higher threshold for RNs because of their high weighting in the compensation index. After replacing data in counties where the sample size was small, we screened for outliers. The purpose of the sample size and outlier screens was to acknowledge that the census data are imperfect (as are CMS and BLS data) and we did not want one or two errant responses to distort a county's compensation index. Because of this replacement, the county-level adjustment has a significant effect only for counties with a significant number of health care workers. Counties with few health care workers will be assigned the market-area wage level for most occupations. The county-level wages are then weighted based on the weights in Table 6-9 to create a weighted average wage for each county and for each MSA or statewide rural area.

Next, the ratio of the county-level weighted average wage to the market-level (i.e., MSA, statewide rural area) weighted average wage was computed. For example, if the weighted county wage was 110 percent of the average for the counties in the MSA, the ratio would be 1.1. We then took the compensation index for that market area computed from BLS data and adjusted it by the county wage ratio computed above. This is the county-specific portion of the compensation index. To compute the compensation index for a county, we weighted the county-specific wage by 50 percent and the original market-level compensation index by 50 percent. (If some of the county-level data were replaced with MSA-level data as part of our screening of the county-level data, then the MSA-level data have a weight of more than 50 percent.) For example, if the census indicates that county A has wages 10 percent above the average for the market area (after replacing missing data), we elevated that county's compensation index 5 percent above the compensation index for the market area.

We are implicitly saying that MSA-wide conditions affect the wages a hospital has to pay its workers, but county-specific conditions also affect those wages. We used a weighting of 50 percent at the MSA level and 50 percent at the county level, although other weightings could be used. In computing county-specific compensation indexes, we limited the total adjustment to a maximum of 5 percent above or below the market-area value. An example is that Manhattan wages will affect overall wage patterns in the MSA, but counties on the fringe of the New York MSA may be able to pay a slightly lower wage than Manhattan hospitals because their workers have lower commuting costs. The difference between Manhattan and the county with the lowest compensation index in the MSA could be up to 10 percent, with the lowest wage index county being up to 5 percent below the mean, and the Manhattan compensation index being 5 percent above the mean. One may have to pay workers up to a 10 percent premium ($20 per day for a worker at $25 per hour) to commute from the lower wage counties of an MSA to the core of the city.

The compensation index for a high-wage county in an MSA would be computed as follows:

County-to-MSA ratio

= (census-weighted county wage)/
(census-weighted MSA wage)
= 1.1

County-specific portion of compensation index

= (BLS index) × (county-to-MSA ratio)
= BLS index × 1.1

Blended county/MSA compensation index

= 0.5 (BLS compensation index) +
0.5 (county-specific compensation index)
= (0.5 × BLS index) + (0.55 × BLS index)
= 1.05 times the BLS compensation index for the MSA.

Smoothing

After blending the BLS and census data, the third step in our calculation is to smooth the county-level blended compensation index values to eliminate large differences between adjoining counties. We created a data set of county pairs. The data set pairs each county with each county that adjoins it. The difference in compensation indexes for each county pair is then computed and the pair with the greatest difference for each county is chosen. If that difference is greater than 10 percent of the larger compensation index, the county with the lower compensation index value is assigned a compensation index equal to 90 percent of its highest neighbor. This process is followed for each county pair, resulting in a new set of compensation indexes. The same algorithm is repeated with the new set of compensation indexes until no difference greater than 10 percent remains. Because compensation indexes are only increased in this process, the entire set of compensation indexes must be revalued to keep it budget neutral with the original set.

If we had selected a smoothing threshold other than 10 percent, results would differ and the number of iterations required to satisfy the condition could differ as well. We chose 10 percent to illustrate the mechanism and because differences of that magnitude between neighbors might be tolerable to providers while still accounting for regional differences. In addition, a 10 percent differential is in the ballpark of what a hospital would have to pay if it were recruiting workers from neighboring counties. For example, a 10 percent difference for a worker making the national mean RN wage of $25.00 an hour would be $2.50 per hour, or $20.00 for an eight-hour day. A lower or a higher bound could be chosen. However a lower bound, such as 5 percent, would cause the smoothing effect to ripple out long distances, especially in California due to the large size of counties. A smoothing bound significantly larger than 10 percent may become large enough to give the hospital in the higher wage county an opportunity to recruit workers from the lower wage county by offering them a wage differential that exceeds the financial and time costs of commuting.

The end result of smoothing and limits on differences within MSAs is that the compensation indexes for any provider will always be at least 90 percent of its neighboring provider's compensation index and 90 percent of the highest compensation index in its MSA.

Adjusting for budget neutrality

After each of the three steps, we adjusted the compensation index for budget neutrality. To do this, we excluded Maryland hospitals because they are not paid under the IPPS system. We estimated inpatient payments with our hospital payment simulation model and altered compensation index values until the estimated payments with the new compensation index differed by less than 0.1 percent from simulated payments using the CMS compensation index (without Section 508 adjustments). The payment model takes into account hospital-specific factors such as indirect medical education payments, disproportionate share payments, sole community hospital status, outlier payments, and Medicare-dependent hospital status. Instead of modeling outpatient effects for budget neutrality, we assumed outpatient shifts would be proportional to inpatient shifts.

Limitations

One limitation is that the BLS survey is voluntary. When data are missing, BLS imputes data for the missing provider. The end result is that BLS provided us with data representing occupations that receive at least 95 percent of hospital payrolls in every MSA, NECTA, and statewide rural area. There is a concern that some providers would not respond to the survey if it were used for payment purposes. However, the incentive to do this will be mitigated by the fact that BLS imputes the wages for nonresponders. The provider would not know if the imputed value would be slightly above or slightly below actual wages. To check for accuracy of survey responses, BLS uses data screens and can cross-check the OES data with other sources of employment and payroll data. ■

Mandate from the Tax Relief and Health Care Act of 2006 and wage index statute

SEC. 106. HOSPITAL MEDICARE REPORTS AND CLARIFICATIONS.

(b) REVISION OF THE MEDICARE WAGE INDEX

CLASSIFICATION SYSTEM.—

(1) MEDPAC REPORT.—

IN GENERAL.—The Medicare Payment Advisory Commission shall submit to Congress, by not later than June 30, 2007, a report on its study of the wage index classification system applied under Medicare prospective payment systems, including under section 1886(d)(3)(E)10 of the Social Security Act (42 U.S.C.1395ww(d)(3)(E)). Such report shall include any alternatives the Commission recommends to the method to compute the wage index under such section.

(2) PROPOSAL TO REVISE THE HOSPITAL WAGE INDEX CLASSIFICATION SYSTEM.—The Secretary of Health and Human Services, taking into account the recommendations described in the report under paragraph (1), shall include in the proposed rule published under section 1886(e)(5)(A) of the Social Security Act (42 U.S.C. 1395ww(e)(5)(A)) for fiscal year 2009 one or more proposals to revise the wage index adjustment applied under section 1886(d)(3)(E) of such Act (42 U.S.C. 1395ww(d)(3)(E)) for purposes of the Medicare prospective payment system for inpatient hospital services. Such proposal (or proposals) shall consider each of the following:

(A) Problems associated with the definition of labor markets for purposes of such wage index adjustment.

(B) The modification or elimination of geographic reclassifications and other adjustments.

(C) The use of Bureau of Labor Statistics data, or other data or methodologies, to calculate relative wages for each geographic area involved.

(D) Minimizing variations in wage index adjustments between and within Metropolitan Statistical Areas and Statewide rural areas.

(E) The feasibility of applying all components of the proposal to other settings, including home health agencies and skilled nursing facilities.

(F) Methods to minimize the volatility of wage index adjustments, while maintaining the principle of budget neutrality in applying such adjustments.

(G) The effect that the implementation of the proposal would have on health care providers and on each region of the country.

(H) Methods for implementing the proposal, including methods to phase-in such implementation.

(I) Issues relating to occupational mix, such as staffing practices and any evidence on the effect on quality of care and patient safety and any recommendations for alternative calculations.

(continued next page)

Mandate from the Tax Relief and Health Care Act of 2006 and wage index statute (cont.)

42 U.S.C. § 1395ww. Payments to hospitals for inpatient hospital services ww(d)(3)(E)

(E) Adjusting for different area wage levels.—

(i) IN GENERAL.— Except as provided in clause (ii), the Secretary shall adjust the proportion (as estimated by the Secretary from time to time) of hospitals' costs which are attributable to wages and wage-related costs, of the DRG prospective payment rates computed under subparagraph (D) for area differences in hospital wage levels by a factor (established by the Secretary) reflecting the relative hospital wage level in the geographic area of the hospital compared to the national average hospital wage level. Not later than October 1, 1990, and October 1, 1993 (and at least every 12 months thereafter), the Secretary shall update the factor under the preceding sentence on the basis of a survey conducted by the Secretary (and updated as appropriate) of the wages and wage-related costs of subsection (d) hospitals in the United States. Not less often than once every 3 years the Secretary (through such survey or otherwise) shall measure the earnings and paid hours of employment by occupational category and shall exclude data with respect to the wages and wage-related costs incurred in furnishing skilled nursing facility services. Any adjustments or updates made under this subparagraph for a fiscal year (beginning with fiscal year 1991) shall be made in a manner that assures that the aggregate payments under this subsection in the fiscal year are not greater or less than those that would have been made in the year without such adjustment. The Secretary shall apply the previous sentence for any period as if the amendments made by section 403(a)(1) of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 had not been enacted.

(ii) Alternative proportion to be adjusted beginning in fiscal year 2005.— For discharges occurring on or after October 1, 2004, the Secretary shall substitute "62 percent" for the proportion described in the first sentence of clause (i), unless the application of this clause would result in lower payments to a hospital than would otherwise be made. ■

Endnotes

1 To be specific, CMS defines as market areas MSAs and metropolitan divisions within those MSAs. The Office of Management and Budget defines 370 MSAs and 29 metropolitan divisions within 11 of those MSAs (OMB 2003). CMS also defines 47 statewide rural areas. Three states have no counties defined as rural. In some cases where MSAs contain parts of several states, CMS defines separate wage indexes for each state, which yields 397 urban market areas. Altogether CMS has 444 pre-reclassification market areas. In this analysis we do not include Puerto Rico and its eight MSAs, but the same methodology could be used for Puerto Rico. We use the 362 MSAs in the United States and the 47 statewide rural areas. There are 3,142 counties in the United States; 1,090 of them in the 362 MSAs, leaving 2,052 in the statewide rural areas (OMB 2003).

2 The wage data are from the BLS Occupational Employment Statistics (OES) survey, which is published each May. For each MSA, state, and the nation they provide an estimate of hourly wages by occupation across all employers in the geographic area. At the national level, they also provide for each industry an estimate of the share of employment in that industry for each occupation. The estimates are constructed from a sample of 1.2 million establishments drawn over three years. The data are carefully collected, edited, and verified. Employment benchmarks for the survey are derived from employment data tabulated from the reports of the unemployment insurance program, and the sample is designed to yield reliable occupation employment estimates by industry. Nonsampling errors are addressed through quality control tools. BLS reduces errors through reviewing and editing and, if necessary, through contact with respondents whose data are internally inconsistent or appear to involve errors (BLS 1997). States supply data on the number of employees and total wages of each employer, which BLS can use to verify the reasonableness of provider responses. Hourly wages on the OES survey do not include benefits and the sample does not include self-employed workers.

3 In some states, such as California, the counties may be so large that they contain distinct labor markets. It might be possible to aggregate census data at a subcounty level but we did not ask the Census Bureau to do so. The large county size also means that smoothing across county boundaries can extend the effects of a high wage index area many miles. This limitation informs the choice of a tolerance level for smoothing; if the allowed difference is too small, many areas' wage indexes could be increased by the existence of one high wage index MSA.

4 Limiting a county's wage index to within 5 percent of the MSA's (or statewide rural area's) wage index generally results in a maximum difference of 10 percent among hospitals in the same market area. In the case of an MSA with a wage index of 1.0 and the national mean hospital RN wage of $27.80 per hour, the highest wage index for a county in the MSA would be 1.05 and the lowest would be 0.95. The implied RN wage in the county with the highest wage in the MSA would be $29.19 (1.05 × $27.80), and implied RN wage in the county with the lowest wage would be $26.41. The maximum differential would be $2.78 an hour or $22.24 a day. This can be thought of as the cost, in terms of time and transportation cost, of commuting from the far reaches of an MSA to the central core. Because this is less than one hour's wage, it seems to be a fairly conservative assumption and does not allow for exaggerated differences to arise between counties in an MSA or statewide rural area. While we believe the 10 percent differential is reasonable, an 8 percent or 12 percent maximum differential among counties in the same MSA may also be reasonable.

5 The county-level wages average slightly less than the MSA-level wage due to the cost of smoothing. Smoothing, which raises some hospitals' wage indexes, is paid for with a slight budget-neutrality adjustment (less than 0.5 percent) applied to all hospitals.

6 The benefit adjustment varies by occupation to reflect the proportion of workers in that occupation employed in each sector. Thus, using the same data, in each market area, the benefit adjustment will automatically differ from sector to sector, reflecting the differing mix of workers employed in each sector. See the section on additional technical information for details (p. 145).

7 This technique is mathematically equivalent to estimating the area wages for the missing occupations to be the national wage for that occupation times the estimated wage index for that area.

8 Our estimates of hospital benefits relative to hospital wages had a national mean almost exactly equal to the national ratio of hospital benefits to hospital wages that BLS reported. We had to use cost report benefit data because the industry-level BLS benefit data are available only on a national basis and not on a market-by-market basis.

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