

**A Primer on the Occupational Mix Adjustment to the  
Medicare Hospital Wage Index**

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# **A Primer on the Occupational Mix Adjustment to the Medicare Hospital Wage Index**

WORKING PAPER SERIES

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This Primer focuses on the occupational mix adjustment (OMA) to the labor-related share in the hospital inpatient prospective payment system. The Primer explains what the OMA is, why it is needed and how it has been calculated (note that as of publication date, legislation has been introduced that would change how the OMA is applied). In addition, reasons why the effect of the OMA has been less than some rural advocates anticipated are discussed.

## **How Does Inpatient PPS Payment Account for the Cost of Labor?**

The hospital inpatient prospective payment system (IPPS) is designed to standardize payments for inpatient care. Under this system, hospitals receive a base operating payment and a capital payment for each Medicare case. The base operating payment rate for each Medicare discharge is split into two components, a labor-related amount and a non-labor related amount. The labor-related amount is the share that is considered to be related to labor costs.

The intention of the wage index adjustment is to capture differences in hospital costs arising from the market-driven cost of labor, which is beyond the manager's control. The adjustment is made based on labor markets, which for hospitals located in non-metropolitan counties is defined as a single market that is the aggregate of all non-metropolitan counties in a given state. After adjustment by the wage index, a second adjustment is made to account for the diagnosis related group (DRG). A more complete explanation of the calculation of IPPS payments can be found in "PPS Inpatient Payment and the Area Wage Index" available at [http://www.shepscenter.unc.edu/research\\_programs/rural\\_program/find.html](http://www.shepscenter.unc.edu/research_programs/rural_program/find.html) (Findings Brief #67, Dalton K, and Slifkin, R).

Theoretically, variation across hospitals in the cost of care that is due to efficiency differences (such as decisions about the mix of professionals used to provide care to similar patients) should not result in payment differences, as these factors are assumed to be under management's control and provide the financial incentive to maximize efficiency. However, as originally calculated, the wage index was capturing not only differences in the price of labor, but also differences in the type of labor used. A market's average hourly wage (AHW) was calculated by dividing total wages paid by all hospitals in the market by total hours worked. Markets with high AHW relative to the national average received greater payment from the Centers for Medicare and Medicaid Services (CMS) for the same DRG. With this method, hospitals in a given market may have a wage index that results in increased payment because (1) the prices for labor (i.e., wage rates) are higher than the national average, which the wage index should compensate for, (2) the hospitals in the market use a more expensive mix of employees, which the wage index should not compensate for, or (3) a combination of both factors.<sup>1</sup>

For example, consider two labor markets A and B, where the hospitals in both markets have the same case mix and face the same rates for all categories of labor. Suppose that for identical tasks, hospitals in Market A use RNs and hospitals in Market B use LPNs. Further assume that RNs have a higher wage than LPNs. Because of the difference in skill mix, the

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<sup>1</sup> For more detail on the calculation of the wage index prior to the occupation mix adjustment, see Wellever A, "Calculating and Using the Area Wage Index of the Medicare Inpatient Hospital Prospective Payment System", available at <http://www.rupri.org/publications/archive/pbriefs/PB2000-5/pb2000-5.pdf>.

AHW in Market A will be higher than in Market B, and hospitals in A will receive more payment for a given DRG, even though they are treating the same type of case, which was not the intent of IPPS.

### **What is the Occupational Mix Adjustment (OMA), and Why is it Needed?**

Because the wage index adjusted IPPS payment for both the cost of labor and the mix of skills used, hospitals located in markets that had below-average hourly wages due to use of a less skilled labor mix received a lower payment than warranted under the intent of the PPS system.<sup>2</sup> Rural advocates have raised concerns about this aspect of the wage index calculation, believing that rural hospitals use a less-skilled labor mix and therefore would see an increase in payments if the effect of occupation skill mix were removed from the wage index.<sup>3</sup> In response to these concerns, CMS developed the occupational mix adjustment (OMA), an adjustment to the calculation of a market's wage index, to remove the impact of variation in skill mix. Simply stated, the goal of the OMA is to standardize skill mix across markets so that the wage index reflects only the pure price difference between a *market* and the nation, assuming all hospitals were using the national average mix of labor inputs within the covered occupations. Markets with an expensive occupational mix have their AHW adjusted downward; those with a cheaper occupational mix have their AHW increased.

### **How Does Occupational Mix Adjustment Adjust the Average Hourly Wage?**

Occupational Mix Surveys determine the proportion of hours worked by nineteen specific occupations and an "all other" classification. The nineteen occupations are grouped into seven clinical occupation "classes"<sup>4</sup> that are included in the OMA: Nursing, Physical Therapy, Occupational Therapy, Respiratory Therapy, Pharmacy, Dietary, and Medical and Clinical Laboratory. Results of the occupational mix survey showed that for the 2006 Fiscal Year, these

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<sup>2</sup> In theory any differences in skill mix of employees that are a result of differences in case mix are already captured by DRG weights; therefore, any differences in labor costs caused by skill mix not related to acuity of patients should be removed from the wage index.

<sup>3</sup> There are some data to support these conclusions, but they are old. Analysis of data from 1992 show that in hospitals in nonmetropolitan counties, RNs account for 21.5% and LPNs 8.0% of employees, compared to 25.7% and 4.8% respectively for hospitals in metropolitan counties. Wootton BH and Ross LT. "Hospital staffing patterns in urban and nonurban areas". *Monthly Labor Review*, March 1995, 23-33.

<sup>4</sup> The language used to refer to the occupations (RN, LPN) and the groups of occupations (Nursing, Physical Therapy) has not yet been universally accepted. The Federal Register refers to the 19 occupations (e.g. RN, LPN) as "standard occupational classifications" and the seven groups of occupations (e.g., Nursing, Physical Therapy) as "general service categories." Centers for Medicare and Medicaid Services. Medicare Program: Changes to the Hospital Inpatient Prospective Payment Systems and Fiscal Year 2006 Rates. (DHHS Pub. No. CMS-1500-F.) 70 FR 47278. August 12, 2005. However, a spreadsheet calculator posted on the CMS website refers to the occupations as "categories." The proposed rule for the Fiscal Year 2007 Occupational Mix Adjustment to the Wage Index refers to the groups of occupations (e.g., Nursing, All Other) as "categories," the occupations (e.g., RN, LPN) as "subcategories," and specific occupations within the RN subcategory (e.g., Management Personnel, Staff Nurses) as "functional subcategories." Centers for Medicare and Medicaid Services. Medicare Program: Hospital Inpatient Prospective Payment Systems Implementation of the Fiscal Year 2007 Occupational Mix Adjustment to the Wage Index. (DHHS Pub. No. CMS-1488-P2). We refer to the specific occupations as "categories" and groups of occupations as "classes."

seven classes accounted for 48.35% of all paid hours in hospitals nationally (37.89%, 1.38%, 0.45%, 1.97%, 2.15%, 0.84%, and 3.68%, respectively),<sup>5</sup> but they may account for more or less in any given hospital. The OMA adjusts the total wages assigned to each class for the proportion of hours worked by each category of workers within the class (Table 1). It does not adjust for workers in the “all other” class, which includes any physicians on salary at the hospital and management, as well as non-clinical staff such as clerical and administrative support and service occupations. The basis for the adjustment derives from market-level aggregation of the differences within each clinical occupation class between each hospital’s proportion of paid hours by job category and the national average proportion of paid hours by job category.

Wages are allocated across classes according to the hours worked, but, unlike the within class adjustment, there is no adjustment to reflect the national distribution across classes. Therefore, while the OMA does recognize hospital-level differences in labor use across classes, it does not adjust wages to reflect what they would have been had a hospital used the national labor mix *across* classes in the same way that it does *within* classes.

**Table 1: Clinical Categories of Workers Included in the OMA**

<b>Clinical Occupation Class</b>	<b>Included Categories of Workers</b>
Nursing	RNs, LPNs, Nurse Aides, Medical Assistants
Physical Therapy	Physical therapists, PT assistants, PT aides
Occupational Therapy	Occupational therapists, OT assistants, OT aides
Respiratory Therapy	Respiratory therapists, RT technicians
Pharmacy	Pharmacists, Pharmacist technicians, Pharmacist assistants
Dietary	Dietician, Diet technician
Medical and Clinical Laboratory	Lab technologist, Lab technician

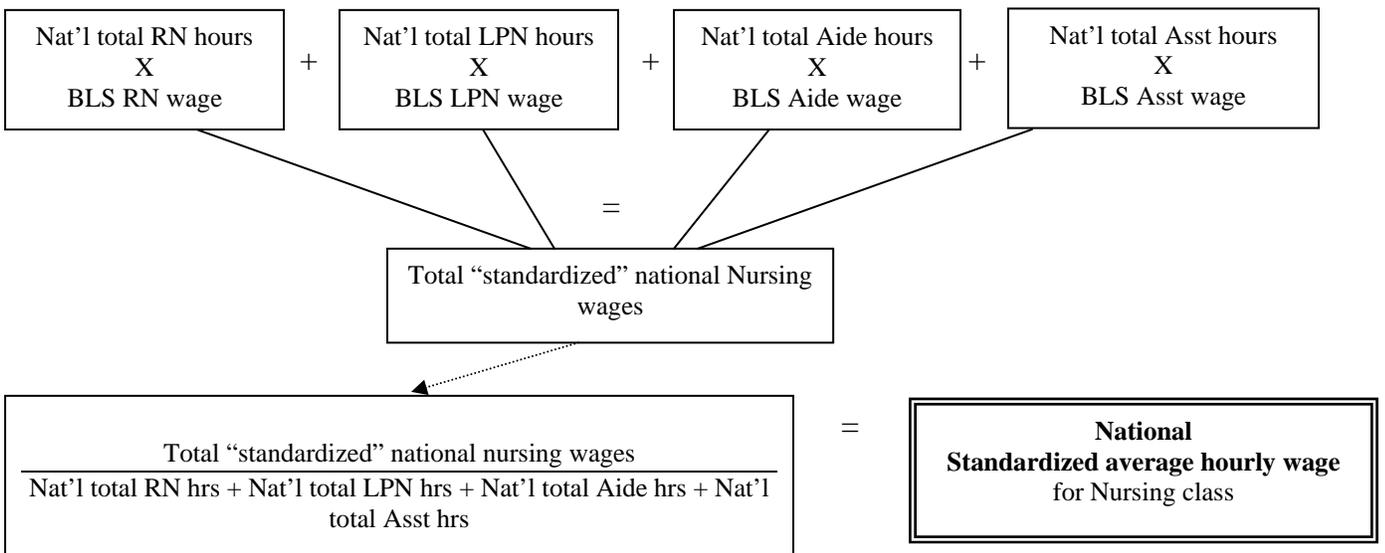
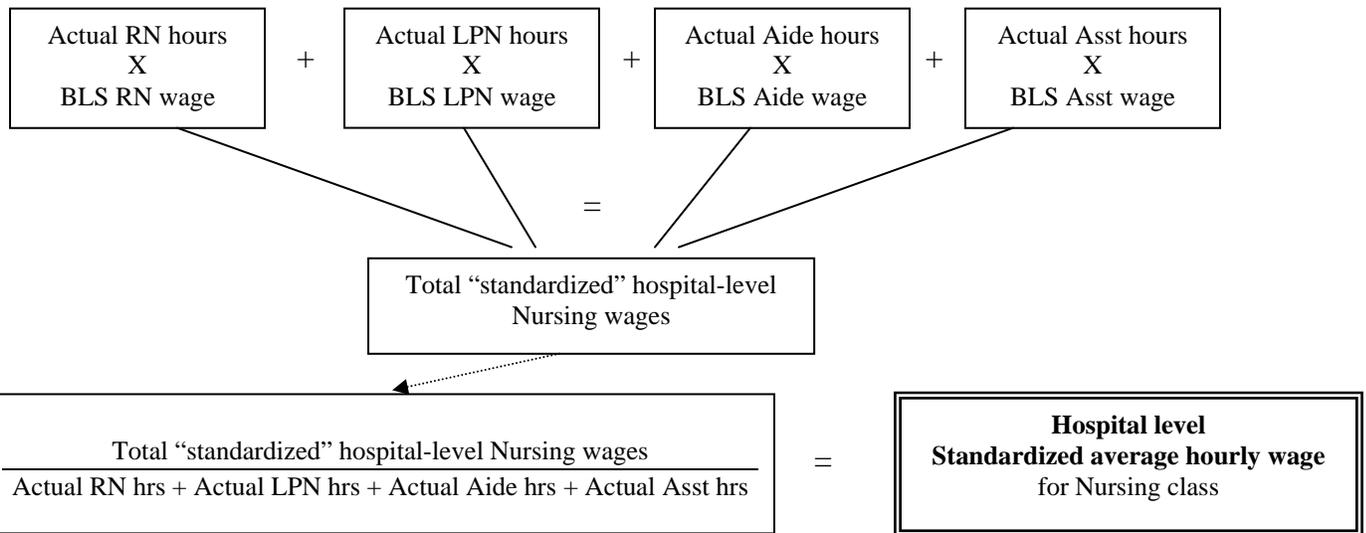
Although initial computations are performed for each hospital, the results are aggregated to the *market-level*, and it is at the *market-level* that the adjustment is made to the wage index. When the data from all hospitals in a market are aggregated, they are hours-weighted. Rather than each hospital in the market contributing equally to the final computation, the calculation uses the sum of adjusted total wage bills in the market, so hospitals with more employees influence the final adjustment more than those with fewer employees. The fact that the calculation is hours-weighted means that a large hospital’s skill mix will have much more of an impact on the final market-level adjustment than a smaller one will. The final adjustment to the payment that an individual hospital receives reflects the skill mix used across the entire market, *not the skill mix at that hospital*.

The occupational mix adjustment is calculated through a series of steps, utilizing hospital-level hours data reported on the occupational mix survey, hospital-level wage data

<sup>5</sup> Centers for Medicare and Medicaid Services. Medicare Program: Changes to the Hospital Inpatient Prospective Payment Systems and Fiscal Year 2006 Rates. (DHHS Pub. No. CMS-1500-F.) 70 FR 47278. August 12, 2005.

reported on the Medicare cost reports, standard wage rates for the occupational categories reported by the Bureau of Labor Statistics, and the national average occupational mix as determined by aggregating the results of all hospitals' occupational mix surveys. The calculation of the occupational mix adjustment factors and adjusted wage index is described below. The calculation is complex, and, although it begins at the hospital-level, the final adjustment is calculated for, and applied to, the entire market.

**Step 1: Calculation of Standardized Average Hourly Wages.** For each hospital and for the nation, calculate an hours-weighted standard AHW for each of the seven classes listed in Table 1. For each hospital, the standardized average hourly wage is calculated using the hospital's actual occupational mix, but using the BLS standard wage rates for each job category. The basic formulae are shown below using the Nursing category as an example.

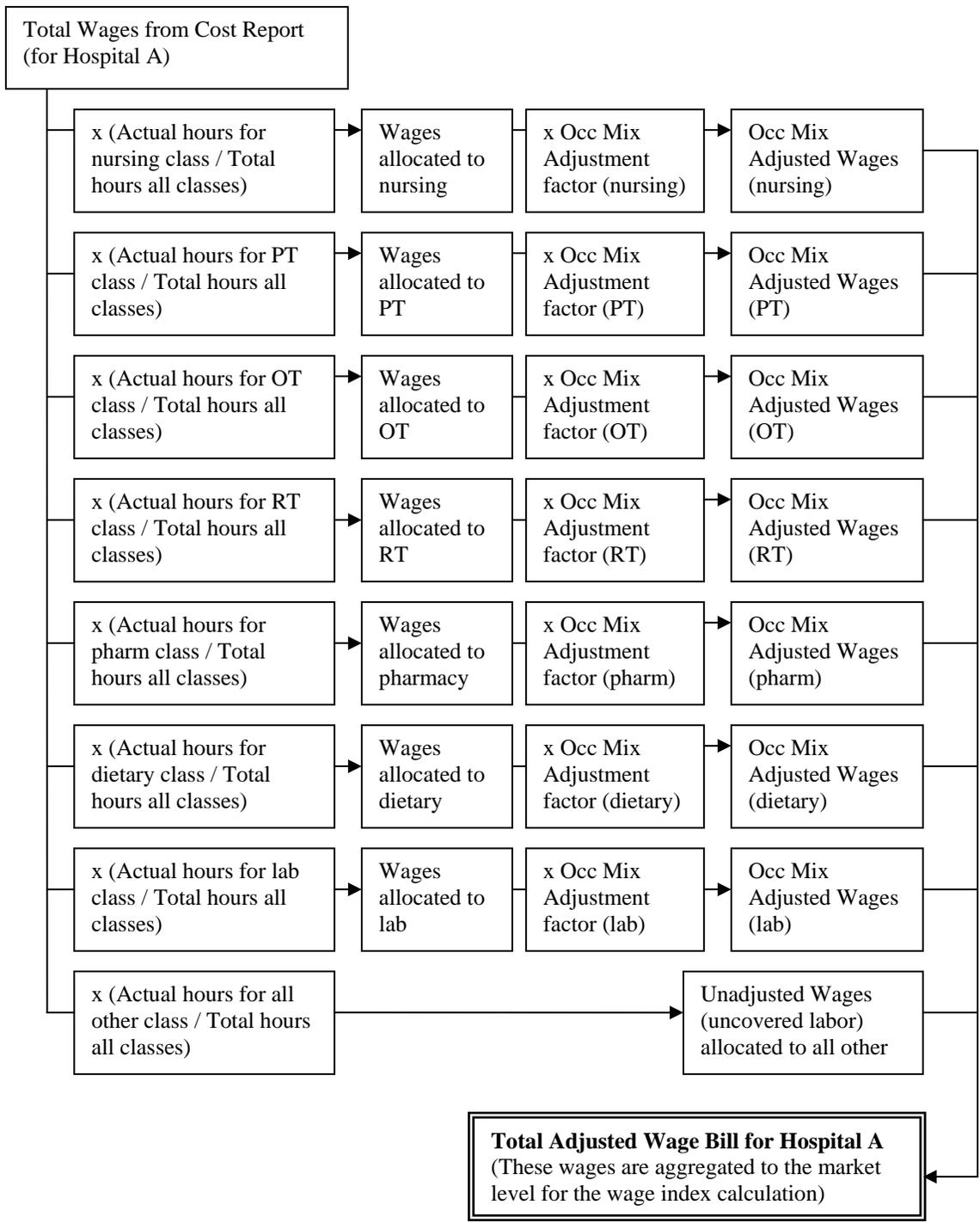


The resulting standardized AHW incorporates the proportion of total hours in each class that is accounted for by each occupation category in the class. So, if a given hospital uses proportionally more skilled nurses than the national average, their nursing standardized AHW will be higher than the national average. The resulting hospital level Standardized average hourly wage for Nursing class is the average hourly wage the hospital would pay for Nursing *if* it had the hospital’s actual occupational mix (within nursing) but faced national wage rates for those occupations.

**Step 2: Calculation of Hospital-Specific Occupational Mix Adjustment Factors for Each of the Seven Clinical Classes.** For each class, the standardized average hourly wage for the nation (from Step 1) is divided by the standardized average hourly wage for the hospital (from Step 1). If the occupational mix adjustment factor exceeds 1.0 for a clinical class, this means that the hospital employs a less skilled mix of labor than the national average and, thus, the hospital’s expected wage bill would increase if it faced its own wage rates but employed the national average skill mix.

$$\frac{\text{National standardized average hourly wage (for Nursing class)}}{\text{Hospital standardized average hourly wage (for Nursing class)}} = \boxed{\text{Hospital specific occupational skill mix adjustment factor (for Nursing class)}}$$

**Step 3: Calculate Total Adjusted Wages for Each Hospital.** Each hospital’s total hospital wage bill from the Medicare Cost Report is allocated to the seven classes covered by the OMA and the “all other” class, using weights equal to the proportion of the paid hours for employees in a class divided by the total paid hours reported on the occupational mix survey. After the wages are allocated, in each of the seven covered classes they are multiplied by the hospital’s class occupational mix adjustment factor, resulting in a total adjusted wage calculation for each class. These are then summed, along with the unadjusted wages from the “all other” class, to create the total adjusted wages for the hospital.



**Step 4: Calculate Market Adjusted Average Hourly Wage.**<sup>6</sup> For each market, sum the total adjusted wage bills (AWB) from Step 3 and total paid hours (PH) from cost reports for all hospitals in the market. Divide the total market adjusted wages by total market paid hours to get the market adjusted average hourly wage.

$$\frac{\text{Hosp 1 AWB} + \text{Hosp 2 AWB} + \dots + \text{Hosp n AWB}}{\text{Hosp 1 PH} + \text{Hosp 2 PH} + \dots + \text{Hosp n PH}} = \boxed{\text{Market adjusted average hourly wage}}$$

**Step 5: Calculate the National Adjusted Average Hourly Wage.** For the nation, sum the adjusted wage bills from Step 4 and the total paid hours from the cost reports for all hospitals in the nation. Divide the total national adjusted wages by total national paid hours to get the national adjusted average hourly wage.

$$\frac{\text{Sum of AWB of all IPPS hospitals in nation}}{\text{Sum of PH of all IPPS hospitals in nation}} = \boxed{\text{National adjusted average hourly wage}}$$

**Step 6: Calculate Market Wage Index.** The market occupational mix adjusted average hourly wage is divided by the national adjusted average hourly wage to get the adjusted wage index for the market. This index value is used to adjust the labor-related share of IPPS payments for all hospitals in the market.

$$\frac{\text{Market adjusted average hourly wage}}{\text{National adjusted average hourly wage}} = \boxed{\text{Market adjusted wage index}}$$

### How Does the Occupational Mix Adjustment Affect the IPPS Payment to Individual Hospitals?

The OMA affects all hospitals in a given market in the same way. If the market has a below-average skill mix, the adjusted average hourly wages will be greater than the unadjusted average hourly wages, so the adjusted wage index will be higher, and the IPPS payment will increase for every hospital in the market. Because the OMA is only used to calculate the market wage index and does not adjust payment to individual hospitals, it will affect the payment to a given hospital *only to the extent* that it affects the market wage index.

<sup>6</sup> Prior to this step, during phase in of the OMA, a blended wage bill was calculated by multiplying the total adjusted wage bill from Step 3 by 10%, multiplying the unadjusted wage bill from the Medicare Cost Report by 90%, and adding these together. As of federal fiscal year 2007, this step will no longer be used.

Because the average hourly wages are hours-weighted when computing the market average hourly wage, the size of the total wage bill is proportionately related to the hospital's "effect" on the market average hourly wage. In labor markets that include both small and large hospitals, the small hospitals contribute little to the final market adjustment. A hospital that is large relative to the market contributes a great deal to the adjustment.

If a small hospital uses a markedly less skilled labor mix than the national average but is in a market with a much larger hospital that uses a mix of clinicians similar to the national average, the market level occupational mix adjustment factor will be close to 1, and the unadjusted wage index (the wage index used prior to OMA) will be similar to the adjusted wage index (the wage index used after OMA implementation). Thus, the small hospital may not see any difference in Medicare reimbursement relative to OMA implementation. This also means that if the small hospital alters its occupational mix, there may not be any notable adjustment to IPPS payments to hospitals in that market. This feature is consistent with the design of the IPPS system; a hospital that can create cost-efficiency by altering its occupational mix is incentivized to do so since the change in the mix does not alter the IPPS payment. It is also consistent with the central motivation of a market having a given wage level facing all hospitals in the market. The OMA merely attempts to identify that wage level relative to other markets using reported wage data.

### **When Was the Occupational Mix Adjustment Implemented?**

The OMA began to be applied to the wage index in federal fiscal year 2005 (beginning October 2004), as mandated by the Medicare, Medicaid, and State Children's Health Insurance Program Benefits Improvement and Protection Act of 2000 (BIPA). Because of concerns about the quality and validity of the data used to calculate the adjustment, CMS began phasing in the OMA, and in the first and second years it only implemented 10% of the adjustment. However, as a result of a court order issued April 3, 2006 in Bellevue Hosp. Ctr. v. Leavitt, CMS will begin applying the full (100%) OMA in federal fiscal year 2007.<sup>7</sup>

### **What Data are Used in the Calculations?**

Hospitals are required to submit data on paid hours by occupational category every three years beginning in 2003. The 2006 survey was revised to collect hospital-specific data on both paid hours and wages for four occupational categories within only the nursing class. The four categories include (1) RNs, (2) LPNs, (3) aides, orderlies, and attendants, and (4) medical assistants. In the 2006 survey, the RN category is further broken down into (a) management personnel and (b) staff nurses or clinicians. Paid hours in the remaining labor classes included on the 2003 survey (e.g., physical therapy, occupational therapy, etc.) were rolled into the "All Other" class on the 2006 survey because, individually, they represented less than four percent of

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<sup>7</sup> Centers for Medicare and Medicaid Services. Medicare Program: Hospital Inpatient Prospective Payment Systems Implementation of the Fiscal Year 2007 Occupational Mix Adjustment to the Wage Index. (DHHS Pub. No. CMS-1488-P2).

total paid hours for hospitals. The most recent reporting period is a 6-month period beginning on or after December 25, 2005, and ending before July 9, 2006. For Fiscal Years 2005 and 2006, national data for the standard occupation mix come from aggregated data from the occupational mix survey. National wage rates come from the Bureau of Labor Statistics surveys. For Fiscal Year 2007, it is proposed that national data for both the standard occupation mix and average hourly wage rates will come from the 2006 occupational mix survey.

### **Why Could the Effect of this Adjustment be Less than Many Rural Advocates Expected?**

There are a number of reasons why the impact of the OMA is smaller than many rural hospital administrators expected. The most important factor is that the adjustment happens at the market-level, rather than for each individual hospital, so a small hospital's mix may have almost no effect on the adjustment made to payment. Also, the factor only applies to covered occupational groups, which may account for less than half of all hours worked (and therefore the same proportion of wages, as wages are allocated to classes according to the percent of hours worked); the factor removes from the wage index differences *within* class categories (e.g. RNs vs. LPNs) but does not standardize differences *across* class categories (e.g. Nursing vs. Physical Therapy); only 10% of eligible wages have been adjusted to date; and the adjustment only applies to the labor related share of payments (which ranges from 62% to 76% of various PPS rates).